ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

FINAL BASIC ASSESSMENT REPORT

PROPOSED HARMONY NYALA PV SOLAR FACILITY, FREE STATE PROVINCE

(DEA REF: 14/12/16/3/3/1/1472)

December 2015

Prepared for:

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ENVIRONMENTAL (PTY) LTD

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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File Reference Number:	
Application Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

PROJECT DETAILS

Title	:	Environmental Basic Assessment Process Final Basic Assessment Report: Proposed Harmony Nyala PV Solar Energy Facility, Free State Province
Authors	:	Savannah Environmental: Karen Jodas Lisa Opperman Gabriele Wood
Sub-consultants	:	Enviro-Niche Consultancy (Ecological specialist) Heritage Contracts and Archaeological Consulting (Heritage specialist) Evolutionary Studies Institute (Palaeontological specialist)
Client	:	BBEntropie (Pty) Ltd
Report Status	:	Final Basic Assessment Report submitted to the Department of Environmental Affairs
Submission	:	December 2015

When used as a reference this report should be cited as: Savannah Environmental (2015) Final Basic Assessment Report: Proposed Harmony Nyala PV Solar Facility, Free State Province.

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SUMMARY AND OVERVIEW OF THE PROPOSED PROJECT

BBEntropie (Pty) Ltd, an Independent Power Producer (IPP), is proposing the development of a photovoltaic (PV) Solar Energy Facility within the Remaining Extent of the Farm Rietpan 17 or alternatively on Farm Rheederpark 443 owned by the Harmony Gold Mining Company. The location of the proposed development falls within Ward 35 under the jurisdiction of the Matjhabeng Local Municipality and the Lejweleputswa District Municipality, Odendaalsrus, Free State Province.

The purpose of the proposed project is to generate electricity for exclusive use by the Harmony Gold Mining Company Ltd. BBEntropie (Pty) Ltd propose to develop and operate the PV plant for Harmony Gold. The facility will supply power to the Freguls Five Substation located at the Harmony Nyala Mine on the Harmony Gold Mine's property. The facility will have a generating capacity of up to 10MW. If the Nyala PV Solar Facility is to be constructed on the remaining extent of Farm Rietpan 17 the facility footprint would be approximately 14.4ha (preferred project site), if the facility is to be constructed on Farm Rheederpark 443 the facility footprint would be approximately 17.5ha (alternative project site). The construction of the PV facility aims to reduce the Harmony Gold Mining Company's dependency on direct supply from the Eskom's National grid for operation activities, while simultaneously decreasing the Mine's carbon footprint.

In order to evacuate the generated power to the Freguls Five Substation located at the Harmony Nyala Mine a new overhead 11KV power line will be constructed between the mini-substation within the PV Solar Facility footprint and the Freguls Five Substation.

The two sites (preferred and alternative) identified for the proposed Harmony Nyala PV Solar Facility is located within the mine's boundary and has been historically disturbed, degraded and transformed. The vegetation on both sites is in a state of severe retroprogression, past the point of self-recovery to its original, natural state. Wetlands occur on or in close proximity to both the preferred and alternative sites and the ecological functioning has largely been altered and lost as a result of various anthropogenic activities. Regardless of the state of the current wetlands, all wetlands are regarded as important ecosystems in need of conservation, in line with the Free State Province's "no wetland loss policy", and therefore should be regarded as sensitive areas. Thus these wetland zones must be accompanied by buffer zones of 32m and be marked as no-go areas where no activities or development can take place.

The current land use of the proposed sites are primarily dominated by communal and informal grazing acitivities by local farmers. These grazing activities appears to be unmanaged and uncontrolled. The communal grazing and other activities are contributing to the further transformation and degradation of the sites, including the sensitive wetland areas. With the construction of the proposed PV solar facility fencing

will be placed around the facility. This will affect the environment in the construction phase but will also create a safety barrier for the area included within the facility so that rehabilitation will be able to take place, without further disturbance by grazing or other activities.

Through the Basic Assessment process, both positive and negative impacts have been identified to be associated with the proposed project. The construction of the proposed project will include direct and indirect benefits at a local and regional scale. The generation of electricity from a renewable resource will have a widespread benefit due to the minimisation of the need to use non-renewable resources for this purpose and the avoidance of associated environmental impacts. The proposed PV solar facility will not only secure the supply of power to the Harmony Nyala Mine, but also indirectly add capacity to the electricity grid (due to the reduced reliance of the Harmony Nyala Mine on this supply). Improved power supply will result in benefits to society at a national scale. As the proposed site falls within an area included in the Harmony mine boundary, which has been degraded and transformed from its natural state, the placement of the PV facility in this area will reduce impacts on ecological systems, and will provide a beneficial alternative land use to mining as the construction and operation of a PV solar facility will have lower impacts on the environment than that of mining. The potential negative impacts that could possibly occur is the contamination and further degradation of the wetlands associated with the proposed project sites, a loss and alteration of vegetation, a loss of habitat and the occurrence of erosion. These potential negative impacts can be avoided and mitigated through the implementation of appropriate mitigation measures.

Overall the proposed project includes benefits that outweigh the impacts associated with the construction and operation of the PV solar facility not only on a local level but also at a regional level.

The nature and characteristics of the proposed project result in Listed Activities (as listed in the EIA Regulations of 2014) being triggered. The following activity requires authorisation (refer to Section A 1(b) for full description):

» The PV Solar Facility will have a generating capacity of up to 10 MW in an area that is in excess of 1 hectare. The development of the infrastructure associated with the facility will have an impact on the environment as the installation process requires construction.
» The construction of ancillary infrastructure associated with the PV Solar Facility will occur within 32 meters of a wetland (watercourse).

In terms of sections 24 and 24D of the National Environmental Management Act (No 107 of 1998), as read with the EIA Regulations of GN R982 – R985 a Basic Assessment process is required to be undertaken for the proposed project.

The nature and extent of the proposed project is explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

1.1. Details of Environmental Assessment Practitioner and Expertise to conduct the Basic Assessment

Savannah Environmental has been appointed as the independent environmental consultant to undertake the Environmental Basic Assessment in order to identify and assess the potential environmental impacts associated with the proposed solar energy facility. Neither Savannah Environmental nor any of its specialist sub-consultants on this project are subsidiaries of or are affiliated to Harmony Nyala PV Solar Facility. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance and evaluate the risk of development; and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental team has considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with electricity generation.

The project team responsible for this Basic Assessment process include:

- Karen Jodas, the principle Environmental Assessment Practitioner (EAP) for this project, is a registered Professional Natural Scientist and holds a Master of Science degree. She has 18 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. She is currently responsible for the project management of EIAs for several renewable energy projects across the country.
- Lisa Opperman, the principle author of this report holds a Bachelor degree with Honours in Environmental Management and has 8 months experience in the

environmental field. Her key focus is on environmental impact assessments, public participation, environmental management plans and programmes, as well as mapping using ArcGIS for a variety of environmental projects. She is currently involved in several EIAs for renewable energy project EIAs across the country

- Gabriele Wood, has eight (8) years consulting experience in public participation and social research. Her experience includes the design and implementation of public participation programmes and stakeholder management strategies for numerous integrated development planning and infrastructure projects. Her work focuses on managing the public participation component of Environmental Impact Assessments and Basic Assessments undertaken by Savannah Environmental.

FINAL BASIC ASSESSMENT REPORT SUBMITTED TO DEA

This Final Basic Assessment Report has been prepared by Savannah Environmental in order to assess the potential environmental impacts associated with the proposed activities. This process is being undertaken in support of an application for Environmental Authorisation from the National Department of Environmental Affairs in terms of the National Environmental Management Act (NEMA; Act 107 of 1998).

The Draft Basic Assessment report was made available for a 30-day review period from **11 September 2015 – 12 October 2015** at the following locations:

» Odendaalsrus Public Library
» Welkom Public Library
» www.savannahsa.com

As required in terms of Regulation 19(1)(a), this Basic Assessment Report has been subjected to a public participation process undertaken in terms of Chapter 6 Regulation 39 – 44 of the EIA Regulations, 2014. The Basic Assessment Report was made available to I&APs and Organs of State for a 30 day review period for comment. The Basic Assessment Report was also submitted to DEA for comment for the 30-day review period.

Relevant contact details are as follows:

National DEA **Herman Alberts** **Tel:** 012 399 9371 **Email:** HAlberts@henvironment.gov.za **Post:** Private Bag X 447, Pretoria, 0001	**Savannah Environmental(EAP):** **Gabriele Wood** **Tel:** 011 656 3237 **Fax:** 086 699 5796 **Email:** gabriele@savannahsa.com **Post:** P O Box 148 Sunninghill 2157

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?	NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

BBEntropie (Pty) Ltd, an Independent Power Producer (IPP), is proposing the development of a photovoltaic (PV) Solar Energy Facility within the remaining extent of the Farm Rietpan 17 or alternatively within Farm Rheederpark 443 owned by the Harmony Gold Mining Company. The location of the proposed development falls within Ward 35 under the jurisdiction of the Matjhabeng Local Municipality and the Lejweleputswa District Municipality, Odendaalsrus, Free State Province.

The purpose of the proposed project is to generate electricity for exclusive use by the Harmony Gold Mining Company Ltd. BBEntropie propose to develop and operate the PV plant for Harmony Gold. The facility will supply power to the Freguls Five Substation located at the Harmony Nyala Mine on the Harmony Gold Mine's property. The facility will have a generating capacity of up to 10MW. If the Nyala PV Solar Facility is to be constructed on the remaining extent of Farm Rietpan 17 the facility footprint would be approximately 14.4ha (preferred project site) if the facility is to be constructed on Farm Rheederpark 443 the facility footprint would be approximately 17.5ha (alternative project site). The construction of the PV facility aims to reduce the Harmony Gold Mining Company's dependency on direct supply from Eskom's National grid for operation activities, while simultaneously decreasing the Mine's carbon footprint.

In order to evacuate the generated power to the Freguls Five Substation located at the Harmony Nyala Mine a new overhead 11KV power line will be constructed between the mini-substation within the PV Solar Facility footprint and the Freguls Five Substation.

The two sites (preferred and alternative) identified for the development of the proposed Harmony Nyala PV Solar Facility is located within the mine's boundary and has been historically disturbed, degraded and transformed. The vegetation on both sites is in a state of severe retroprogression past the point of self-recovery to its original, natural state. Wetlands occur on or in close proximity to both the preferred and alternative sites and the ecological functioning of these wetlands has largely been altered and lost as a result of various anthropogenic activities. Regardless of the state of the current wetlands, all wetlands are regarded as important ecosystems in need of

conservation, in line with the Free State Province's "no wetland loss policy", and therefore should be regarded as sensitive areas. Thus these wetland zones must be accompanied by buffer zones of 32m and be marked as no-go areas where no activities or development can take place.

The following infrastructure will be associated with the development of the Harmony Nyala PV Solar Facility:

» Photovoltaic (PV) panels of up to 4m in height (fixed-tilt/static technology) with a generating capacity of up to 10MW.
» Mounting structures to be either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels.
» Cabling between the project components, to be lain in trenches ~ 1-2m deep.
» Power inverters between the PV arrays.
» Transformers with a step-up of 11KV.
» A mini-substation.
» An overhead distribution power line for the distribution of the generated power to the Freguls Five Substation.
» A main external access road (5 meters in width) that leads to the development site and minor internal roads between the PV arrays.
» Office, workshop area for maintenance and storage.
» A water pipeline, of 35cm in diameter that will transport water from the Harmony Nyala Mine to the PV facility.
» Lighting and fencing in and around the facility for security.
» During construction (temporary infrastructure) such a laydown areas will also be required.

The nature and characteristics of the proposed project results in Listed Activities (as listed in the EIA Regulations) being triggered. The following activity requires authorisation (refer to Section A 1(b)):

» The PV Solar Facility will have a generating capacity of up to 10 MW in an area that is in excess of 1 hectare. The development of the infrastructure associated with the facility will have an impact on the environment as the installation process requires construction.
» The construction of ancillary infrastructure associated with the PV Solar Facility will occur within 32 meters of a wetland (watercourse).

The technology to be implemented in the proposed development will be as follows:

Photovoltaic Cells

Solar energy facilities, such as those using PV panels, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This effect

refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity.

Solar photovoltaic (PV) panels consist primarily of glass and various semiconductor materials and in a typical solar PV project, will be arranged in rows to form solar arrays. The PV cell is positively charged on one side and negatively charged on the other side and electrical conductors are attached to either side to form a circuit. This circuit then captures the released electrons in the form of an electric current (direct current). An inverter must be used to change the direct current (DC) to alternating current (AC). The electricity is then transmitted through a power line for distribution and use.

Support Structure

The photovoltaic (PV) modules will be mounted to steel support structures. The PV panels will be installed at a fixed-tilt angle, optimised to receive the maximum amount of solar radiation.

Fixed Mounted PV System

In a fixed mounted PV system, PV panels are installed at a pre-determined angle from which they will not move during the lifetime of the plant's operation. The advantages which are gained from fixed mounted systems include:

» The maintenance and installation costs of a fixed mounted PV system are lower than that of a tracking system, which is mechanically more complex given that these PV mountings include moving parts.
» Fixed mounted PV systems are an established technology with a proven track record in terms of reliable functioning. In addition, replacement parts are able to be sourced more economically and with greater ease than with alternative systems such as tracking PV systems.
» Fixed mounted systems are robustly designed and able to withstand greater exposure to winds than tracking systems.

Inverter

The photovoltaic effect produces electricity in direct current (DC). Therefore an inverter must be used to change the electricity to alternating current (AC) in order to be used by consumers. The inverters convert the DC electric input into AC electric output, and then a transformer steps up the current to 33 kV for on-site distribution of the power. The inverter and transformer are housed at the power conversion station (PCS). The PV combining switchgear (PVCS), which are dispersed among the arrays, collect the power from the arrays for transmission to the project's substation.

The solar facility is designed to operate continuously for more than 25 years with minimal maintenance required.

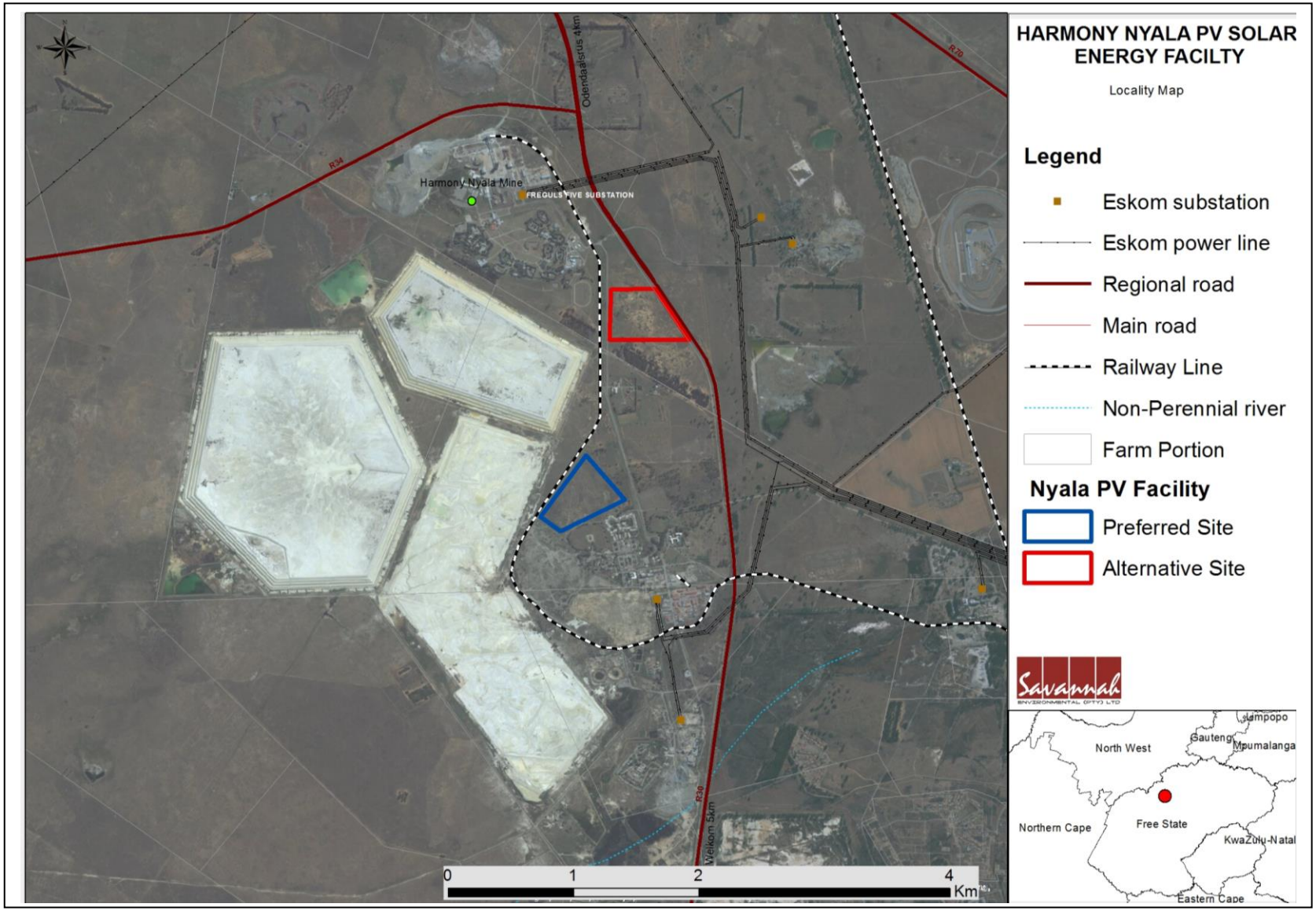

Figure 1: Locality map indicating the location of the Harmony Nyala PV Solar Facility, Free State Province

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN 983, 984 and 985	Description of project activity
GN R983, December 2014, Activity 1 (ii) The development of facilities or infrastructure for the generation of electricity from a renewable resource where the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.	***The proposed PV Solar Facility will generate up to 10 MW of power and will cover an area of 14.4 hectares.***
GN 983, December 2014, Activity 12 (xii) The construction of: (xii) infrastructure or structures with a physical footprint of 100 square metres or more Where such development occurs (a) within a watercourse, or (b) within 32 metres of a watercourse.	***Infrastructure associated with the PV Solar facility exceeding 100m² in extent will be constructed within 32m of the edge of a watercourse***

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2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this application as required by Regulation. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose

and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Two alternative sites have been identified by the Harmony Gold Mining Company as land available for the development of the proposed Harmony Nyala PV Solar Facility. The proposed sites are land owned by the Harmony Gold Mining Company and fall within the Remaining Extent of the Farm Rietpan 17 (preferred site) or alternatively Farm Rheederpark 443 (alternative site).

As the overall purpose of the facility is to generate power for the use of the Harmony Nyala Mine, Harmony Gold has identified the remaining extent of Farm Rietpan 17 and Farm Rheederpark 443 as the most feasible options for the development of the facility. This decision was based on the availability of land for the development of a PV solar facility, the proximity to the Harmony Nyala Mine (exclusive user of the generated power) and the proximity to the Freguls Five Substation as the connection point. Thus only the two site alternatives (refer to **Figure 1**) is available and deemed practicable for the proposed PV solar facility. These site alternatives (including the preferred site and the alternative site) are assessed in this report. For the coordinates of the site corners (preferred site and alternative site) refer to **Appendix A4.**

Preferred Site		
Description	**Lat (DDMMSS)**	**Long (DDMMSS)**
The preferred project site falls within the remaining extent of the Farm Rietpan 17	27°55'20.15"S	26°41'0.09"E
Alternative Site		
Description	**Lat (DDMMSS)**	**Long (DDMMSS)**
The alternative project site falls within the Farm Rheederpark 443.	27°54'32.78"S	26°41'16.93"E
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

11kv Overhead distribution power line

The proposed Harmony Nyala PV Solar Facility will require the development of an overhead power line to distribute the generated power to the Freguls Five Substation for use by the Harmony Nyala Mine. The proposed route of the power line (applicable for both the preferred and alternative site) will follow the secondary (un-named) road and will be located within the Harmony Nyala Mine's railway line servitude leading towards the Harmony Nyala Mine (refer to **Appendix A2** for the facility layouts). No alternative routes are being considered for the power line as the proposed route would be the shortest option for the connection to the substation and it is located within an already disturbed area, i.e. railway line and secondary road servitude. Due to the proximity of the proposed development footprint to the substation and the fact that the proposed route runs parallel with an existing road and railway line which minimises the environmental impact, no other practicable alternative exists.

Alternatives:	**Latitude (S):**	**Longitude (E):**
Preferred Site (power line route)		
• Starting point of the activity	27°55'9.73"S	26°41'1.43"E
• Middle/Additional point of the activity	27°54'28.98"S	26°41'4.31"E
• End point of the activity	27°53'58.30"S	26°40'41.82"E
Alternative Site (power line route)		
• Starting point of the activity	27°54'25.65"S	26°41'10.30"E
• Middle/Additional point of the activity	27°54'2.69"S	26°41'2.10"E
• End point of the activity	27°53'58.30"S	26°40'41.82"E

Water pipeline

The proposed Harmony Nyala PV Solar Facility will require the development of a water pipeline to transport water from the Harmony Nyala Mine to the site for use during the construction phase and operation phase (i.e. maintenance purposes). The water pipeline route is proposed to follow the proposed power line route proposed for the facility.

Alternatives:	**Latitude (S):**	**Longitude (E):**
Preferred Site (water pipeline route)		
• Starting point of the activity	27°55'8.908"S	26°41'2.09"E
• Middle/Additional point of the activity	27°54'29.63"S	26°41'3.63"E
• End point of the activity	27°53'58.30"S	26°40'41.82"E
Alternative Site (water pipeline route)		
• Starting point of the activity	27°54'25.50"S	26°41'9.38"E

• Middle/Additional point of the activity	27°54'7.07"S	26°41'3.20"E
• End point of the activity	27°53'58.30"S	26°40'41.82"E

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

Please refer to **Appendix A4** for the coordinates of the route layout.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

b) Layout alternatives

Design and layout alternatives were not assessed during the compilation of the report. The initial layout was revised based on environmental sensitivities as indicated by the ecologist. The location of the layout, specifically in the case of the preferred site, aims to avoid these identified sensitivities and the area available for the layout of the infrastructure is constrained on this basis. The revised layout (see **Appendix A3**) is therefore the recommended site layout alternative.

Alternative 1		
Description	**Lat (DDMMSS)**	**Long (DDMMSS)**
Alternative 2		
Description	**Lat (DDMMSS)**	**Long (DDMMSS)**
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
Few technological options exist as far as PV technologies are concerned. Those that are available are usually differentiated by weather and temperature conditions that prevail so that optimality is obtained by the final selection. While the impacts of all PV technologies are not identical (tracking PV requires a greater area per megawatt installed), the choice of technology does not materially affect the environmental impact of the proposed development as the development footprint is considered or assessed as 'total loss'. The construction, operation and decommissioning of the facility will also be the same irrespective of the technology chosen. Therefore, no alternatives were

assessed in this regard.

No other renewable technology alternatives were assessed because the site has been identified by BBEntropie and the Harmony Gold Mining Company as being desirable for the establishment of a photovoltaic (PV) plant, and the development of other renewable technologies such as wind or concentrated solar power (CSP) are not considered viable or feasible as a result of the following:

- A wind energy installation was not considered as a feasible and reasonable alternative as the proposed developmental area does not have the required wind resource.
- A CSP installation was not considered as a feasible and reasonable alternative as the facility is proposed to have a generating capacity of up to 10 MW, which is not considered feasible for CSP technology. In addition, large volumes of water are required for cooling, unlike PV where water is only required for cleaning purposes.

Therefore, a PV facility is considered by BBEntropie and the Harmony Gold Mining Company to be the only feasible power generation activity for the proposed site.

Alternative 2
N/A
Alternative 3
N/A

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

No other alternatives are applicable.

Alternative 1 (preferred alternative)
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Alternative 2
Alternative 3

e) No-go alternative

This is the option of not constructing the PV facility and associated infrastructure as proposed. This option is assessed as the "no go alternative" or 'do nothing' in this Basic Assessment Report.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	Size of the activity:
Preferred Site	Approx. 144000 m^2
Alternative Site	Approx. 175000 m^2
Alternative A3 (if any)	m^2

or for linear activities:

11kv Overhead distribution power line

Alternative:	Length of the activity:
Alternative A1 (preferred site power line route)	Approximately 2426m
Alternative A2 (alternative site power line route)	Approximately 1222m
Alternative A3 (if any)	m

Water pipeline

Alternative:	Length of the activity:
Alternative A1 (preferred site water pipeline route)	Approximately 2425m
Alternative A2 (alternative site water pipeline route)	Approximately 1204m
Alternative A3 (if any)	m

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

Alternative:	Size of servitude:
Preferred Site power line route	Approximately 22m
Alternative Site power line route	Approximately 22m

Alternative A3 (if any)	m^2

4. SITE ACCESS

Preferred Site

Does ready access to the site exist?	**NO**
If NO, what is the distance over which a new access road will be built	Approximately 196m from an existing (unnamed) secondary road

Alternative Site

Does ready access to the site exist?	**NO**
If NO, what is the distance over which a new access road will be built	Approximately 10m from an existing (unnamed) secondary road

Describe the type of access road planned:

A main access road of up to 5 meters in width (gravel road) will be constructed and connected to an existing secondary road which lies in parallel with the R30– refer to **Figure 2** and **Figure 3**. The PV Solar facility will also include minor internal access roads of up to 5 meters in width between the project components for maintenance and security purposes.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site (Refer to **Figure 2** and **Figure 3**).

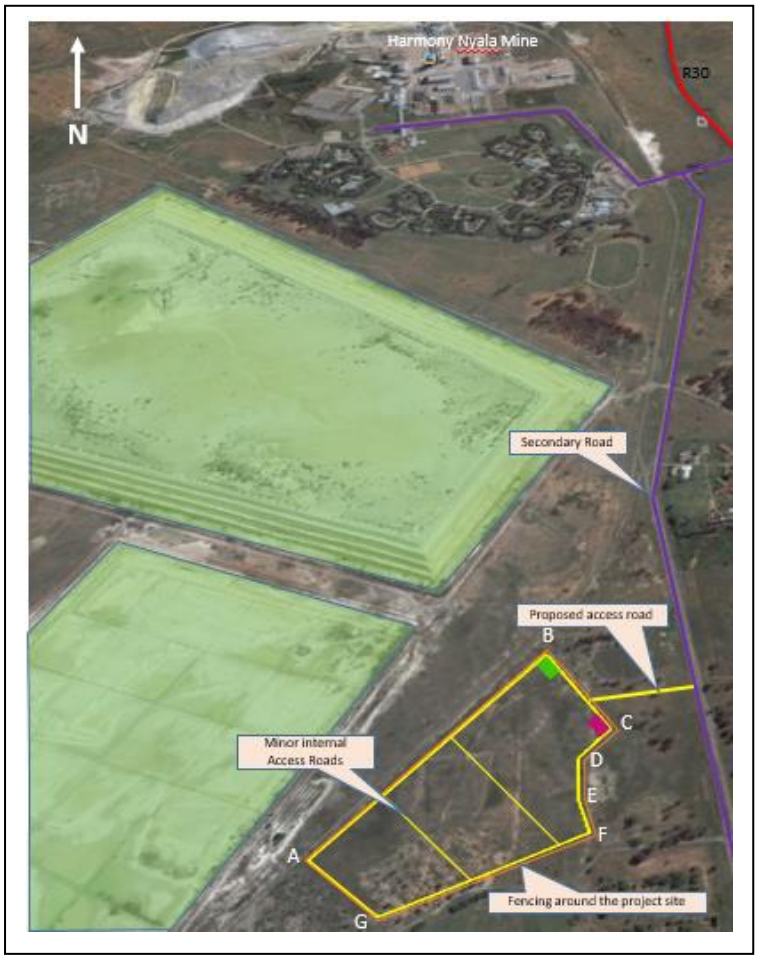


Figure 2: Map indicating access roads for the preferred site of the proposed PV Solar Facility

Figure 3: Map indicating access roads for the alternative site of the proposed PV Solar Facility

5. LOCALITY MAP

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

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

A locality map has been included as part of this report as **Appendix A1.**

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

A layout plan for each site alternative has been included as part of this report within **Appendix A2.**

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

The layout plan for each site alternative has been overlain on a sensitivity map, and is included in **Appendix A3.**

8. SITE PHOTOGRAPHS

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

Site photographs from the centre of the alternative sites taken in the eight major compass directions have been included as part of this report within **Appendix B.**

9. FACILITY ILLUSTRATION

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

A facility illustration has been included as part of this report within **Appendix C.**

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?		**NO**	Please explain
The proposed project site falls within the authorised mining boundary/Mining Right area of the Harmony Gold Mining Company and is proposed to be developed on property owned by the mine. The proposed development site is currently zoned for agricultural use. Therefore, the development footprint or site will be required to be rezoned to 'special use' as required by the municipality. Subdivision may be required.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	**YES**		Please explain
The Free State PSDF is a provincial spatial and strategic planning policy that responds to and complies with, in particular, the National Development Plan (NDP) Vision 2030 and the National Spatial Development Perspective (NSDP). This framework promotes a developmental state in accordance with the principles of global sustainability as is stated by, among others, the South African Constitution and the enabling legislation. The Free State PSDF is based on six growth and development pillars, each of which has its own set of drivers with long-term programmes. Pillar 1 highlights the job creation, economic and sustainable growth by expanding and maintaining basic road infrastructures through the implementation of alternative electricity infrastructures. The proposed project will contribute towards job creation during the construction of the proposed facility. The proposed project is a renewable energy facility that will feed power into the Harmony Nyala Mine, resulting in a reduction of pressure from the mine on the Eskom national grid to supply them with electricity for operations. Therefore the proposed project is in line with the Free State PSDF.			
(b) Urban edge / Edge of Built environment for the area		**NO**	Please explain
The proposed project sites (preferred and alternative) are located approximately 6km south of the town of Odendaalsrus and approximately 8km north of the town of Welkom. Both sites fall outside of the urban edge and within the authorised Harmony mining boundary.			
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	**YES**		Please explain
One of the identified sustainable business practices for the Matjhabeng Local Municipality (as per the 2011 IDP) is to implement practices and procedures that			

reduce reliance on non-renewable resources with similar PV projects planned for development. The manufacturing of solar panel components is a project identified in terms of the municipality's Local Economic Development Plan.

The proposed solar energy facility is therefore in line with the municipality's IDP and will assist in meeting the set objectives. The solar facility will also create direct job opportunities that will stimulate local economic growth. The project will not compromise the integrity of the IDP.

(d) Approved Structure Plan of the Municipality	**YES**		Please explain

There are several renewable energy projects that are proposed in the Lejweleputswa District Municipality under the DoE's Renewable Energy Independent Power Producers Procurement Programme (REIPPPP). However, the proposed Harmony Nyala Solar Facility will not be bid under the REIPPP Programme as it is the Harmony Gold Mining Company's intention to utilise the power exclusively for their existing mining operations as a way of reducing total carbon emissions and diversifying electricity supply to the mine. The municipality will need to confirm whether the existing municipal infrastructure available will have the capacity for the proposed project, including the capacity for waste in the associated waste landfill.

(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)		**NO**	Please explain

The Matjhabeng Local Municipality does not have an Environmental Management Framework as a development guiding tool in its jurisdiction. The Free State Department of Tourism and Economic Development is in the process of developing a provincial biodiversity plan.

(f) Any other Plans (e.g. Guide Plan)	YES	NO	Please explain

N/A

3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	**YES**		Please explain

The main purpose of the development is to generate electricity from a renewable resource, which will be fed into the Harmony Nyala Mine for exclusive use. The project

is not specifically considered within the approved municipal SDF. However the municipality identified basic service delivery such as electricity, job creation and economic growth as priorities within the SDF both locally and within the district municipality. The proposed development will assist in achieving these objectives.			
4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	**YES**		Please explain
The evacuation of additional power for use by the Harmony Gold Mining Company Nyala Mine will serve to improve the stability of the national grid within the immediate area as a reduction in the demand for electricity by the mine will reduce the supply pressure on the national grid for the area. The proposed project will also assist the government in achieving the goal of 17GW renewable energy as part of the electricity generation technology mix by 2030. In addition, the project will assist in the reduction in the need to mine non-renewable resources such as coal for conventional power generation. The proposed development will benefit the local community through job creation, skills development opportunities and training which will, in turn, assist in reducing poverty levels that the area is currently facing, and indirectly strengthen electricity supply for the area. The proposed project site falls within the authorised mining boundary/mining right area of the Harmony Gold Mining Company. The property is currently zoned for agricultural use. Amendments to the current zoning will be needed and as no specific zoning category exists for the operation of a PV Solar Facility the area will need to be zoned as "special use" and subdivision may be required.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	**YES**		Please explain
Consultation between the Applicant, BBEntropie (Pty) Ltd, and the Matjhabeng Local Municipality for the delivery of necessary municipal services for the development is in process and confirmation for capacity from the municipality in this regard will be confirmed.			

6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)		**NO**	Please explain
The proposed project is to be developed by a private developer (i.e. BBEntropie) and not the municipality. It therefore does not fall within the infrastructure planning of the municipality, although the need for the promotion of alternative energy sources is advocated in the municipal IDP. The project will not have any implications for the infrastructure planning of the municipality.			
7. Is this project part of a national programme to address an issue of national concern or importance?	**YES**		Please explain
Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy (November 2003). In order to meet the long-term goal of a sustainable renewable energy industry, a goal of 17.8GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010. This energy will be produced mainly from wind, solar, biomass, and small-scale hydro (with wind and solar comprising the bulk of the power generation capacity). This amounts to ~42% of all new power generation being derived from renewable energy forms by 2030. This is however dependent on the assumed learning rates and associated cost reductions for renewable options. The proposed Harmony Nyala PV Solar Facility will not feed power directly into the national grid. It will be evacuated for exclusive use by the Harmony Gold Mining Company's Nyala Mine. This will however reduce the mine's direct dependency on the supply of energy from the national grid. If in the future the Harmony Gold Mining Company's Nyala Mine closes or no longer requires the generated power, it can then be sold to Eskom or alternatively other entities requiring power.			
8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	**YES**		Please explain
The proposed site for the development of the Harmony Nyala PV Solar facility is situated within the mining boundary of the Harmony Gold Mining Company and on land owned by the mine. The project is proposed to be constructed south of the Harmony Nyala Mine. The location of the proposed facility includes benefits such as that the exclusive user of the generated power is situated in close proximity to the project site, the point of connection to the Freguls Five Substation is in close proximity, shortening			

the length of the distribution line needed, and water sourced from the Harmony Nyala Mine (transported via a 35cm in diameter pipeline) will be in close proximity to the site. These location factors are for both the preferred and alternative sites.

9. Is the development the best practicable environmental option for this land/site?	**YES**		Please explain

The proposed location for the Harmony Nyala PV Solar Facility falls within close proximity to the Harmony Nyala Mine and is proposed to be constructed on the remaining extent of Farm Rietpan 17 (preferred site) or alternatively on the Farm Rheederpark 443 (alternative site), within the mining boundary. The proposed site has been transformed and altered through historical anthropogenic activities. Ecological features have been degraded beyond a point of recovery to its natural state. This facility will be contributing to a positive and sustainable function for the site in the long-term, as it will no longer be available for mining activities as well as the prevention of further over grazing and other activities taking place on site as fencing will be placed around the facility decreasing accessibility. The PV facility will also reduce the Harmony Nyala Mine's dependency on non-renewable power sources for operational purposes, as well as producing clean energy that will not have a detrimental effect on the broader environment.

10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	**YES**		Please explain

The negative impacts associated with the proposed activity include localised impacts on vegetation, soils and land use and are expected to be limited to the development footprint, and are not considered to be of high significance (refer to Section D). All impacts can be managed and mitigated to acceptable levels, as outlined in the Environmental Management Programme (refer to **Appendix G**).

The proposed sites have been transformed and altered through historical anthropogenic activities. Ecological features have been degraded beyond a point of recovery to its natural state. This facility will be contributing to a positive and sustainable function for the site in the long-term, as it will no longer be available for mining activities as well as prevention of further over grazing and other activities taking place on site as fencing will be placed around the facility decreasing accessibility. It will reduce the Harmony Nyala Mine's dependency on non-renewable power sources for the operation of the mine, as well as producing clean energy that will not have a detrimental effect on the broader environment.

Positive impacts associated with the facility include i) diversifying of the power use for the mine ii) generation of electricity from a renewable resource also reduces reliance (although limited) on conventional power sources; iii) local economic upliftment and limited job creation iv) and the reduction of the carbon footprint of the Harmony Nyala Mine. These positive impacts will extend beyond the boundary of the site and are expected to outweigh the negative impacts.

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?		**NO**	Please explain
Applications for the development of PV solar facilities in the surrounding areas of Hennenman, Victoria, Allanridge and Rheederpark have been submitted. Each similar project will need to be assessed in terms of its particular impacts on the environment. The proposed development will therefore not set a precedent for the construction of PV solar facilities in the area.			
12. Will any person's rights be negatively affected by the proposed activity/ies?		**NO**	Please explain
The proposed project will take place on privately owned land which falls within the Harmony Gold Mining Company's mining boundary. The Harmony Nyala Mine is intended to be the exclusive user/offtaker of the power to be generated. Harmony Gold Mining Company would enter into a lease agreement with the developer (BBEntropie) who will develop and operate the PV plant to supply power to Harmony Gold. No infrastructure will extend beyond the boundaries of the mining area. Therefore, no rights of any persons will be negatively affected.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?		**NO**	Please explain
The project will not undermine the urban edge in any way as the site is located outside of the urban areas of Odendaalsrus and Welkom.			
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?		**NO**	Please explain
It must be noted that the project is a potential SIP project and would only become registered as a SIP project if selected as a preferred bidder project by the Department of Energy (or through some other entity as may be legally able to do so at the time when the project is implemented).			
15. What will the benefits be to society in general and to the local communities?			Please explain
Job opportunities, although limited, will be created during the construction and operation of the proposed facility. In addition, local and regional economic benefits would be realised through the additional revenue generated as a result of the proposed project (through direct and indirect job opportunities, local spend, local procurement, etc.). The primary benefit to society in general will be a reduction in the use of non-renewable resources for the generation of power, contributing to a sustainable environment and development.			
16. Any other need and desirability considerations related to the proposed activity?			Please explain
The project developer (BBEntropie) together with Harmony Gold Mining Company has identified the need for the PV Solar Facility and the associated infrastructure. The power generated at the PV facility is proposed to be used exclusively by the Harmony			

Nyala Mine. The project is considered to be desirable for the Harmony Gold Mining Company as it will reduce the overall carbon emissions and footprint of the mine, and also diversify electricity supply for the existing Harmony Nyala Mine.

17. How does the project fit into the National Development Plan for 2030?	Please explain

By 2030 South Africa aims to reduce carbon emissions, promote economic development and increase the GDP. This project will fit into this vision since it aims to contribute towards electricity supply through renewable energy sources. This solar power facility with which the activities are associated will assist in reducing the country's carbon footprint, as it will be generating renewable energy, and will facilitate infrastructure growth in the area through employment and increasing infrastructure.

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

The general objectives of Integrated Environmental Management have been taken into account for this Basic Assessment Report by means of identifying, predicting and evaluating the actual and potential impacts on the environment, socio-economic conditions and cultural heritage component. The risks, consequences, alternatives as well as options for mitigation of activities have also been considered with a view to minimise negative impacts, maximise benefits and promote compliance with the principles of environmental management

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The principle of environmental management as set out in section 2 of NEMA states that:

» Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably;
» Development must be sustainable socially (people), environmentally (planet) and economically (prosperity);and
» Sustainable development requires the consideration of all the relevant factors,

The current state of the proposed project site has been degraded by historical anthropogenic activities and overgrazing to such an extent that recovery to its former natural state is not deemed possible. As recovery is not an option, use of the site for the proposed project will be beneficial to not only the availability of non-renewable power resources in the country but also the proposed site. The fencing placed around the site will protect the portion of land associated with the facility from further overgrazing and degradation. From a project perspective the development can be considered sustainable as it makes use of a renewable energy resource, does not result in any significant impacts during its construction, and does not emit any pollution during the operational phase.

These principles of sustainable development further taken into account by including measures within the Environmental Management Programme (EMPr) to mitigate impacts that may occur thereby further reducing the environmental impacts. The EMPr would provide mitigation measures in terms of disturbance to ecosystems, loss of biodiversity, pollution and degradation to the environment, waste and stormwater management.

11.APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable. Refer to **Table 1** overleaf.

Table 1: Relevant legislative and permitting requirements applicable to the establishment of the proposed Harmony Nyala PV Solar Facility.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of GNR 983 of December 2014, a Basic Assessment process is required to be undertaken for the proposed project	Department of Environmental Affairs – competent authority Free State Department of Economic Development, Tourism and Environmental Affairs (FS DEDTEA) – commenting authority	The listed activities triggered by the proposed solar energy facility have been identified and assessed in the EIA process being undertaken (i.e. Basic Assessment). This Basic Assessment Report will be submitted to the competent and commenting authorities in support of the application for authorisation.
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the	Department of Environmental Affairs	While no permitting requirements arise from this section of the Act, this will be applicable during construction and operation in order to ensure minimisation of impacts on the environment.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	cumulative effect of a variety of impacts.		
Environment Conservation Act (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992)	Department of Environmental Affairs Free State Department of Economic Development, Tourism and Environmental Affairs Local Authorities	Noise impacts are expected to be associated with the construction phase of the project and are not likely to present a significant intrusion to the local community. Therefore is no requirement for a noise permit in terms of the legislation.
National Water Act (Act No 36 of 1998)	Water uses under S21 of the Act must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation.	Department of Water and Sanitation	A water use license (WUL) is required to be obtained if water resources are impacted on. No water resources will be impacted directly by the proposed layout of the facility. However, should the towers of the power line or facility infringe on the wetland bodies identified on site, a water use license would be required to be obtained.
National Water Act (Act No 36 of 1998)	In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.	Department of Water and Sanitation	This section of the Act will apply with respect to the potential impact on the slope seepage wetland located on the preferred site or the wetland flat located on the alternative site, primarily during the construction phase (i.e. pollution from construction vehicles).
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	A mining permit or mining right may be required where a mineral in question is to be mined (e.g. materials from a borrow pit) in accordance with the provisions of the Act.	Department of Mineral Resources	As no borrow pits are expected to be required for the construction of the facility, no mining permit or right is required to be obtained.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act. S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002): In terms of the Act approval from the Minister of Mineral Resources is required to ensure that proposed activities do not sterilise a mineral resources that might occur on site		A Section 53 application will be submitted the Free State DMR office by the applicant.
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards.	Department of Environmental Affairs	No permitting or licensing requirements arise from this legislation. The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.
National Heritage Resources Act (Act No 25 of 1999)	S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including: » The construction of a road, power line, pipeline, canal or other similar linear	South African Heritage Resources Agency (SAHRA) Free State Heritage Resources	A permit may be required should identified cultural/heritage sites on site be required to be disturbed or destroyed as a result of the proposed development.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	development or barrier exceeding 300 m in length; and » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent. Stand alone HIAs are not required where an EIA Process is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component.		An Archaeological Impact Assessment has been undertaken as part of the Basic Assessment Process to identify archaeological sites (refer to **Appendix D2**). No resources were discovered through the Archaeological Impact Assessment. It should however be noted that if during the construction phase any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find. A Palaeontological Impact Assessment has been undertaken as part of the Basic Assessment Process to identify possible impacts of the development on the palaeontology of the site (refer to **Appendix D3**). The proposed PV Solar Energy Facility will not impact on any palaeontological material. If any fossil discoveries are made during the construction, then it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue them if

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			necessary (with the relevant SAHRA permit).
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase. The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and	Department of Environmental Affairs	As the applicant will not carry out any restricted activity, as is defined in S1 of the Act, no permit is required to be obtained in this regard. Specialist flora and fauna studies have been undertaken as part of the basic Assessment process. As such the potential occurrence of critically endangered, endangered, vulnerable, and protected species, as well as critically endangered (CR), endangered (EN), vulnerable (VU) or protected ecosystems and the potential for them to be affected has been considered, this report is contained in **Appendix D1** (Ecological Impact Assessment).

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GoN 1002), 9 December 2011).		
Conservation of Agricultural Resources Act (Act No 43 of 1983)	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Weeds are described as Category 1 plants, while invader plants are described as Category 2 and Category 3 plants. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.	Department of Agriculture	This Act will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented. The permission of agricultural authorities will be required if the project requires the draining of vleis, marshes or water sponges on land outside urban areas.
National Forests Act (Act No. 84 of 1998)	» In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except	National Department of Forestry	A permit would need to be obtained for any protected trees that are affected by the development. The protected *Schizocarpus nervosus*, which is listed in the Free State Nature Conservation Ordinance (Act 8

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated". » GN 1042 provides a list of protected tree species.		of 1969) as a Protected Plant (Schedule 1) is present on the proposed site. Should individuals of this plant be impacted directly by the proposed facility, a permit from the provincial conservation authority for the removal/relocation thereof will need to be applied for.
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S21 the landowner would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S12 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the landowner must have such equipment, protective clothing, and trained personnel for extinguishing fires.	Department of Water and Sanitation	While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating	Department of Health	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. • Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance • Group IV: any electronic product; and • Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.		Health.
Development Facilitation Act (Act No 67 of 1995)	Provides for the overall framework and administrative structures for planning throughout the Republic. S(2 - 4) provide general principles for land development and conflict resolution.	Matjhabeng Local Municipality Lejweleputswa District Municipality	The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the Act.
Subdivision of Agricultural	Details land subdivision requirements and	Department of Agriculture,	The land will be leased by the

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Land Act (Act No 70 of 1970)	procedures. Applies for subdivision of all agricultural land in the province	Forestry and Fisheries	Harmony Gold Mining Company and is currently zoned as agricultural. After authorisation has been grated the area will need to be rezoned to "special use" and subdivision may be required.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is	National Department of Water and Environmental Affairs Provincial Department of Environmental Affairs (general waste)	As no waste disposal site is to be associated with the proposed project, no permit is required in this regard. Waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as detailed in the EMPr (refer to **Appendix G**).

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	stored, are intact and not corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented.		
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed	South African National Roads Agency Limited (national roads) Provincial Department of Transport	» An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. » Transport vehicles exceeding the dimensional limitations (length) of 22m. » Depending on the trailer configuration and height when loaded, some of the substation components may not meet specified dimensional limitations (height and width).

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.		
Provincial Legislation			
The Nature Conservation Ordinance 8 of 1969 and amendments	Lists plant and animal species as protected	Free State Department of Economic Development, Tourism and Environmental Affairs	The protected *Schizocarpus nervosus*, which is listed in the Free State Nature Conservation Ordinance (Act 8 of 1969) as a Protected Plant (Schedule 1) is present on the proposed site. Should individuals of this plant be impacted directly by the proposed facility, a permit from the provincial conservation authority for the removal/relocation thereof will need to be applied for.

12.WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES** ■
If YES, what estimated quantity will be produced per month?	Not determined at this stage

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

Construction solid waste will be sorted on site into hazardous waste and general waste. Hazardous waste will be collected and disposed of by an accredited contractor to a registered hazardous waste site. Non-hazardous waste/general waste will be sorted for recycling, where possible. Waste that is not recyclable will be appropriately disposed of at the nearest licensed landfill site.

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

After the sorting of waste takes place, where recyclable waste, general waste and hazardous waste is identified, each waste class will be disposed of accordingly. Recyclable waste will be recycled through accredited recycling companies, hazardous waste will be disposed of at registered and accredited hazardous waste disposal sites and general solid waste will be disposed of at the registered Matjhabeng municipal solid waste disposal site.

Will the activity produce solid waste during its operational phase?	■ **NO**
If YES, what estimated quantity will be produced per month?	

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

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

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

/

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? **NO**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility? **NO**

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? **NO**

If YES, what estimated quantity will be produced per month? m^3

Will the activity produce any effluent that will be treated and/or disposed of on site? **NO**

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

Will the activity produce effluent that will be treated and/or disposed of at another facility? **NO**

If YES, provide the particulars of the facility:

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

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

The following measures could be put in place to ensure optimal reuse or recycling of water:

» During the construction phase measures may be put in place to separate clean water and dirty water.
» Sewage will be handled/managed through the establishment of portable ablution facilities.
» Where clean water is available, which has not yet been used/altered, it will be collected and released into nearby water bodies.
» Water used within the construction process, if tested and found to be within the required limits may be used for dust suppression.

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?	**NO**
If YES, is it controlled by any legislation of any sphere of government?	

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

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

Solar energy installations operate by converting solar energy into electricity. This is characterised as a non-consumptive use of a natural resource and consumes no fuel for its continuing operation. Solar power produces an insignificant quantity of greenhouse gasses over its lifecycle as compared to conventional coal-fired power stations. During the construction phase minor dust impacts and exhaust emissions may occur, but will not exceed acceptable limits. The operational phase of a solar facility does not produce carbon dioxide, sulphur dioxide, mercury, particulates, or any other type of pollution.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	**NO**

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?		**NO**
If YES, is it controlled by any legislation of any sphere of government?		

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

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

Minimal noise will occur during construction phase by moving vehicles and the operation of machinery. This is not regarded as a significant noise source/ impact and will not constitute a "disturbing noise".

13.WATER USE

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

Municipal	Water board	Groundwater	River, stream, dam or lake	**Other**	The activity will not use water

During the construction phase water will be supplied by the Harmony Nyala Mine. Water (7.5-10m^3, 2-3 times per annum) will be sourced from the Harmony Gold Mining Company's Nyala Mine via a 35cm diameter pipeline during the operational phase. The water will be used for washing and maintenance purposes of the PV panels, approximately 2-3 times per annum, depending on the circumstances and need.

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:	**N/A**
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	**NO**

If YES, please provide proof that the application has been submitted to the Department of Water Affairs. **Refer to Appendix D.**

14. ENERGY EFFICIENCY

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

The activity is in itself an activity that is proposed to generate electricity from a cleaner alternative energy source (i.e. solar radiation).

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

The purpose of a PV installation is to utilise a renewable energy source (i.e. solar radiation) for the production of electricity. Therefore it is not required to consider any additional alternative energy sources.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

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

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/ physical address:

Province	Free State Province
District Municipality	Lejweleputswa District Municipality
Local Municipality	Matjhabeng Local Municipality
Ward Number(s)	Ward 35
Farm name and number	Farm Rietpan RE/17 and Farm Rheederpark 443
Portion number	-
SG Code	F03900000000001700000 F02400000000044300000

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:

The proposed site falls within the authorised mining boundary of the Harmony Gold Mining Company. Even though it falls within the mining boundary it is currently zoned for agricultural use

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

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

1. GRADIENT OF THE SITE

Indicate the general gradient of the site:

Preferred Site:

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

Alternative Site:

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

Alternative S3 (if any):

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

2. LOCATION IN LANDSCAPE

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

Preferred site:

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

Alternative site:

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

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site located on any of the following?

	Preferred Site:		**Alternative Site:**		**Alternative S3 (if any):**	
Shallow water table (less than 1.5m deep)		**NO**		**NO**	YES	NO
Dolomite, sinkhole or doline areas		**NO**		**NO**	YES	NO

Seasonally wet soils (often close to water bodies)	**YES**		**YES**		YES	NO
Unstable rocky slopes or steep slopes with loose soil		**NO**		**NO**	YES	NO
Dispersive soils (soils that dissolve in water)		**NO**		**NO**	YES	NO
Soils with high clay content (clay fraction more than 40%)		**NO**		**NO**	YES	NO
Any other unstable soil or geological feature		**NO**		**NO**	YES	NO
An area sensitive to erosion		**NO**		**NO**	YES	NO

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

4. GROUNDCOVER

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

Preferred site:

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

Alternative Site:

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

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

Please refer to **Appendix D1** for the relevant impact assessment.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Preferred Site

Perennial River/watercourse		**NO**	
Non-Perennial River/watercourse		**NO**	
Permanent Wetland		**NO**	
Seasonal Wetland	**YES**		
Artificial Wetland		**NO**	
Estuarine / Lagoonal wetland		**NO**	

Alternative Site

Perennial River/watercourse		**NO**	
Non-Perennial River/watercourse		**NO**	
Permanent Wetland		**NO**	
Seasonal Wetland	**YES**		
Artificial Wetland		**NO**	
Estuarine / Lagoonal wetland		**NO**	

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

Preferred Site:

In close proximity to the preferred site (north-east of the site) a NFEPA classified wetland (depression wetland) is situated, this wetland is situated far enough from the proposed development area not to be impacted by it. However within the study area a small change in typography has created a small slope seepage wetland in the eastern corner of the study area. This seepage zone has been highly impacted and subsequently transformed and degraded by numerous activities including significant changes within the catchment area (tar roads and railway line), causing the seep to be seldom inundated. The Free State Province has a "No wetland loss policy"; this policy aims to prevent any loss of wetlands in the province, regardless of the state or origin of the wetland. Therefore, the degraded slope seepage wetland is required to be avoided by the development footprint or any other activity.

Mitigation measures can be implemented, which include amendments to the proposed site facility boundary to avoid infringing on the slope seepage wetland present on site, as to adhere to the above mentioned policy and to protect the feature. As per the Ecology specialist's recommendation (refer to **Appendix D1**), a 32 meter buffer must be placed around the wetland and be classified as a no-go area where no development, disturbance or activities may take place during construction or operation of the facility.

Alternative Site:

This site can be described as a flat bottomland within which more than 70% is covered by a wetland flat. This wetland is highly impacted and transformed, with its hydrological nature severely altered by numerous, significant changes in the catchment area (especially due to R30). Within the wetland flat numerous, small typographical changes has created a mosaic of inundation patterns were the lower lying areas is seasonally saturated and the higher lying areas is rarely inundated. The Free State Province has a "No wetland loss policy"; this policy aims to prevent any loss of wetlands in the province, regardless of the state or origin of the wetland. Therefore, the degraded seasonal depression wetland and slope seepage wetland are required to be avoided by the development footprint or any other activity.

As the wetland area covers 70% of the site it is no longer considered as a viable option for the proposed facility as there is not sufficient space available for the development. As per the Ecology specialist's recommendation (refer to **Appendix D1**), this site alternative must be excluded from the site alternatives as to avoid major environmental impacts on the wetland flat and limitations to land availability.

6. LAND USE CHARACTER OF SURROUNDING AREA

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

Natural area	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station [H]
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential[A]	Church	Agriculture
Retail commercial & warehousing	Old age home	**River, stream or wetland**
Light industrial	Sewage treatment plant[A]	Nature conservation area
Medium industrial [AN]	Train station or shunting yard [N]	Mountain, koppie or ridge
Heavy industrial [AN]	**Railway line [N]**	Museum
Power station	Major road (4 lanes or more) [N]	Historical building
Office/consulting room	Airport [N]	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam[A]	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Agriculture

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

A railway line, owned by the Harmony Gold Mining Company runs from the Harmony Nyala Mine southwards towards the Harmony Kudu and Eland Mines and is mainly used for the transportation of mining related infrastructure and materials. The proposed PV Facility will not be impacted on by the railway line. However, the railway line will be impacted on by the facility as the power line connection from the facility tothe Freguls Five substation will be required to cross the railway line.

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

N/A

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)		**NO**
Core area of a protected area?		**NO**
Buffer area of a protected area?		**NO**
Planned expansion area of an existing protected area?		**NO**
Existing offset area associated with a previous Environmental Authorisation?		**NO**
Buffer area of the SKA?		**NO**

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

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

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

Preferred site and Alternative site:

From the Archaeology Impact Assessment undertaken (included in **Appendix D2**) it has been determined that there are no significant archaeological risks associated with the development and both alternatives are acceptable from a heritage point of view.

No sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The same goes for the Later Iron Age period where the study area is situated outside the western periphery of distribution of Late Iron Age settlements in the Free State. However to the north of the study area, ceramics from the Thabeng facies belonging to the Moloko branch of the Urewe tradition were recorded at Oxf 1 and Platberg 32/71 (Maggs 1976, Mason 1986). Similarly to the east Makgwareng ceramics belonging to the Blackburn Branch of the Urewe tradition was recorded (Dreyer 1992 and Maggs 1976). There is however a low likelihood of finding sites dating to this period in the study area.

Due to extensive sand cover, ground visibility was low on portions of the site during survey, the possible occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool

scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

From an archaeological point of view there is no reason why the development should not proceed.

From the Palaeontological specialist desktop study undertaken (included in **Appendix D3**) no reasons were identified that prejudice the progression of the proposed PV solar facility.

The proposed site for the Harmony Nyala PV solar facility falls on rocks of the Permian Volksrust Formation which could contain coal deposits. More detailed information of the region shows that Free State Coal Field, between the Vaal River in the north and Theunissen in the south contains a coal zone that is 25 to 50m thick. In the north the coal occurs 50-100m below the surface and in the south it occurs at 320-360m below the surface. At Odendaalsrus, therefore, the coal would be somewhere between 50 and 360m below the ground surface. The coals here are of poor quality and are no longer mined. Coal is made of compressed and heat altered fossil plants and is of no palaeontological interest per se. However, good fossil plant material can occur in the shales and mudstones that occur within and between the coal seams. There are no reports of fossils from this area in the published and unpublished catalogues and field reports of the Evolutionary Studies Institute, University of the Witwatersrand. Fossil vertebrates do not occur in association with coal deposits.
Since the poor quality coal deposits are well below the surface, and the proposed PV solar facilities will be on the ground surface, with foundations of a few meters depth only, the project will not impact on any palaeontological material. As far as the palaeontology is concerned the proposed development can go ahead and no further palaeontological impact assessment is required.

If fossil plant material is discovered during the construction of foundations, then it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue them if necessary (with the relevant SAHRA permit).

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

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

According to the Matjhabeng Local Municipality profile, the unemployment rate in the municipality in 2011 was 14.4%.

Economic profile of local municipality:

Matjhabeng represents the hub of mining activity in the Free State province. The economy of the Matjhabeng Municipality was based on the gold mining industry, and although the gold mining industry has declined since 1991, three of the biggest gold producers in the world are still active in the area and some are even expanding. The mining activities located in and around Allanridge, Odendaalsrus, Welkom and Virginia. Manufacturing aimed at the mining sector exists to a limited extent in the above towns. Other manufacturing activities are limited. Mining still dominates the local economic scene by contributing 58% of the GDP of the area and 19% of the province. Major strategies are in place to change the economic base away from the mining dependency. The FGF Development Centre, economic development arm of the Matjhabeng Council is devising major strategies to change the economic base away from the mining dependency (source: http://www.rsa-overseas.com/about-sa/matjhabeng.htm).

Level of education:

With regard to education levels, the portion of the population older than 20 years without formal education is 4.6%, while only 9% of the portion of the population has a higher education. 28% of the population older than 20 years has a matric.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R100 000 000	
What is the expected yearly income that will be generated by or as a result of the activity?	R12 000 000	
Will the activity contribute to service infrastructure?		**NO**
Is the activity a public amenity?		**NO**

How many new employment opportunities will be created in the development and construction phase of the activity/ies?	» Development Phase = 3 » Construction Phase = 50-100 » Operational Phase = 3
What is the expected value of the employment opportunities during the development and construction phase?	» Development Phase = R 50 000 » Construction Phase= R 100 000
What percentage of this will accrue to previously disadvantaged individuals?	Still to be determined
How many permanent new employment opportunities will be created during the operational phase of the activity?	3
What is the expected current value of the employment opportunities during the first 10 years?	R30 000 X 12 = R360 000 R360 000 X 10 = R3 600 000
What percentage of this will accrue to previously disadvantaged individuals?	Still to be determined

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category	If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan

Critical Biodiversity Area (CBA)	**Ecological Support Area (ESA)**	**Other Natural Area (ONA)**	**No Natural Area Remaining (NNR)**	**N/A**

b) Indicate and describe the habitat condition on site

Preferred Site:

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	0%	As a result of significant historical anthropogenic activities taking place on site the natural state has been transformed and degraded to the point where recovery is no longer a possibility.
Near Natural (includes areas with low to moderate level of alien invasive plants)	15%	Near natural areas occur on site where transformation has taken place and a low to moderate level of alien invasive species occur.
Degraded (includes areas heavily invaded by alien plants)	45%	Moderately invaded by invasive alien plants, including the replacement of natural climatic vegetation with indigenous pioneer and sub-climatic weeds and grasses has taken place on the proposed project site. The slope seepage wetland, located to the eastern corner of the site, has been degraded through historical anthropogenic activities.
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	40%	Old excavations and turned patches occur that have historically taken place on site which has contributed to the transformation of the site. Other activities which have led to the transformation of the site includes the construction of twin tracks and overgrazing. Also a severely altered wetland body on site due to transformation activities within catchment area (lifted road and railway track etc.) has contributed to degradation of the site.

Alternative Site:

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	0%	As a result of significant historical anthropogenic activities taking place on site the natural state has been transformed and degraded to the point where recovery is no longer a possibility.
Near Natural (includes areas with	5%	Near natural areas occur on site where transformation has taken place and a low to moderate level of alien

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
low to moderate level of alien invasive plants)		invasive species occur.
Degraded (includes areas heavily invaded by alien plants)	65%	Severe degradation has taken place on site through historical anthropogenic activities. Moderate to high levels of alien plant invasion (e.g. dense stand of Eucalyptus trees to the south / south-east of the site) occur on site, including the replacement of natural climatic vegetation with indigenous pioneer and sub-climatic weeds, grasses and sedges. Ground cover within the immediate area and the surroundings of Eucalyptus trees stand largely devoid of vegetation. Most of the wetland's character has been altered to a severely degraded state and include hydrological, geo-hydrological as well alterations to the hydrophytic vegetation
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	30%	Transformation on the site has taken place through the construction of twin tracks, footpaths, power lines and pylons. The Eucalyptus stand located to the south-east of the site has also contributed to the transformations. A severely altered and transformed wetland body occurs on site due to the following activities: » Lifted tar roads (including R30) » Gravel road. » Mining activities. » Eucalyptus stand / plantation

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

Preferred site:

Terrestrial Ecosystems		Aquatic Ecosystems		
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act	Critical Endangered Vulnerable **Least**	**Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)**	Estuary	Coastline

Terrestrial Ecosystems		Aquatic Ecosystems				
No. 10 of 2004)	**Threatened Western Free State Clay Grassland**	**YES slope seepage wetland**	[redacted]	**NO**	[redacted]	**NO**

Alternative site:

Terrestrial Ecosystems		Aquatic Ecosystems				
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	**Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)**		Estuary		Coastline
	Endangered					
	Vulnerable					
	Least Threatened Western Free State Clay Grassland	**YES wetland flat**	[redacted]	**NO**	[redacted]	**NO**

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

The study area is situated in the Grassland biome, and is covered by the Western Free State Clay Grassland (Gh 9). This least threatened ecosystem has been described by Mucina and Rutherford (2006) as a flat bottomland which support dry, species-poor grassland.

The study area, both the preferred site located on the remaining extent of Farm Rietpan 17 and alternative site located on Farm Rheederpark 443, can be described as bottomlands with very gentle gradual slopes and small typographical irregularities within the landscape. Both sites have been severely impacted by numerous anthropogenic activities and have over time led to the entire transformation and degradation of these sites including their wetland bodies, resulting in the loss and alteration of the ecological functioning.

In close proximity to the preferred site (north-east of the site) a NFEPA classified wetland (depression wetland) is situated, this wetland is situated far enough from the proposed development area not to be impacted by it. However within the study area a small change in typography has created a small slope seepage wetland in the eastern corner of the study area. This seepage zone has been highly impacted and subsequently transformed and degraded by numerous activities including significant changes within the catchment area (tar roads and train track), causing the seep to be seldom inundated. Through the EIA process this small slope seepage wetland has been

excluded, including a 32m buffer, from the preferred site as to avoid any impacts associated with the development and to ensure that further degradation and transformation of the wetland does not take place (refer to **Appendix A3**). The alternative site can be described as a flat bottomland within which more than 70% is covered by a wetland flat. As with the case of the seepage wetland on the preferred site, this wetland is also highly impacted and transformed, with its hydrological nature severely altered by numerous, significant changes in the catchment area (especially due to R30).

Regardless of the state of the current wetlands, all wetlands are regarded as important ecosystems in need of conservation and therefore should be regarded as sensitive areas. The conservation of wetlands in the Free State province is also supported by the Free State "no wetland loss policy", which ensures the conservation of all wetlands in the province regardless of their nature and state. Thus these wetland zones accompanied by buffer zones of 32 m should be marked as no-go areas.

The vegetation is in a state of severe retroprogression past the point of self-recovery to its original, natural state. The veld is dominated by pioneer and sub-climax increaser 2 grass species, pioneer and exotic forbs and a small element of invading karroid shrub land. Subsequently this transformation effects expose the study area to other cumulative effects such as for example; soil capping and sheet erosion, invasion of weeds and alien invasives etc.

Overall the study area is species poor and low in diversity. No rare, endangered or endemic species were found with only on species, *Schizocarpus nervosus* (geophyte), noted that is listed in the Free State Nature Conservation Ordinance (Act 8 of 1969) as a Protected Plant (Schedule 1). Both sites are characterized by the invasion of numerous weeds and exotics (total of 27 different species) although the extent of invasion of these species is moderate. Regarding the fauna of the study area, a few ground squirrel (*Xerus inaurus*) burrows have been observed. These burrows are also shared with yellow mongoose (*Cynictus penicillata*). No protected or endangered species were noted within the study area.

Three vegetation units were identified namely:

- Unit 1: *Eragrostis lehmanniana – Cynodon dactylon* unit which is the terrestrial unit of both the preferred and alternative site. This unit has been highly transformed and has a low conservation value, a low ecosystem functionality and is considered as being of low sensitivity.
- Unit 2: *Cynodon dactylon – Paspalum notatum* unit which is associated with a seepage wetland that occurs on the preferred site study area. This unit has a medium to high conservation value, a low to medium ecosystem functionality and is considered as being of high sensitivity.
- Unit 3: *Eragrostis lehmanniana – Cyperus usitatus* unit which is associated with the wetland flat of the alternative site. This unit has a medium to high conservation

value, a low to medium ecosystem functionality and is considered as being of high sensitivity.

From an ecological perspective the preferred site for the development is regarded as the best option for the proposed photovoltaic facility development as the development will not have significant negative impacts on the above ground ecology of the site if all mitigation measures are followed as specified within this report. Regarding the alternative site; as the wetland flat covers more than 70% (including 32 m buffer zone, more than 75%) of the site, insufficient space is available for the proposed development. Furthermore any developmental activities within this alternative site will have a detrimental effect on the wetland, as such the alternative site should not be considered for the proposed development and should be excluded.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	The Vista Newspaper	
Date published	17-September-2015	
Site notice position	**Latitude**	**Longitude**
	27°54'32.3"S	26°41'8.2"E
	27°55'5.3"S	26°40'55"E
Date placed	20-06-2015	

Include proof of the placement of the relevant advertisements and notices in **Appendix E1.**

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

The public consultation process has included the publishing of notices regarding the proposed project as well as the distribution of notification letters to the identified I&APs. Affected and neighbouring landowners have been consulted through one-on-one consultation sessions and via telephone, as required.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN R982:

Refer to the database attached within Appendix E5

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Simon Gear	BirdLife South Africa, Policy and Advocacy Manager	advocacy@birdlife.org.za
Samantha Ralston	BirdLife South Africa	energy@birdlife.org.za
Johan Koegelenberg	Sentech Ltd, Coverage Planner: RF Networks	koegelenbergJ@sentech.co.za
John Wesson	Wildlife and Environment Society of South Africa (WESSA), Northern Region	jwesson@wessanorth.co.za

Include proof that the key stakeholder received written notification of the proposed activities as **Appendix E2**. This proof may include any of the following:

- e-mail delivery reports;

- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

Proof that the key stakeholders received written notification of the proposed activities is included in **Appendix E2.**

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

The following comments have been received to date:

Summary of main issues raised by I&APs	Summary of response from EAP
The main issues raised in regards to the proposed project raised are: i. the amount of job opportunities which will be available for the local community members ii. which specialist studies have been undertaken as part of the EIA process and iii. site alternatives for the each of the facilities have significant impacts and should not be considered feasible alternatives for development. iv. a palaeontological assessment is required to be undertaken before the start of the development (SAHRA). v. the Free State land cover data indicates wetlands other than the NFEPA maps. vi. A wetland specialist needs to be appointed by the EAP to delineate these wetlands and other wetlands that may occur and to determine appropriate buffers for these (which is not necessarily 32m, the latter being a legislative threshold to indicate whether environmental authorisation is required or not). It is suggested that they use the wetland buffer tool recently published by the Department of Water Affairs and Sanitation (DWAS).	The response from the EAP regarding the issues raised was as follow: i. As the project is of a small nature only a few job opportunities will be created. ii. An ecological and wetland impact assessment was undertaken, as well as a heritage impact assessment (HIA) including an Archaeological Impact Assessment and a Palaeontological Impact Assessment. iii. The sites identified for alternative project sites were considered due to limited land availability as well as the proximity to the relevant mining shaft. The preferred site layout was designed to avoid sensitive areas and the alternative sites are not be considered feasible for development as they infringe on sensitive areas. iv. A desktop palaeontology impact assessment has been conducted and was submitted to SAHRA on 6 July 2015 (refer to **Appendix D3**). v. The Ecological Specialist Study undertaken for the development considers the Free State Land Cover data in regards to the potential for wetlands to occur within the site in specified areas. vi. The ecologist responsible for the Ecological Specialist Study has adequate experience and a clear understanding of the area, the development footprint for the proposed

	Nyala PV Solar Energy Facility, as well as the ecological function of the area to conduct a wetland delineation. The Department of Water Affairs and Sanitation (DWS) buffer tool was utilised to determine the minimum buffer required for the wetlands in order to maintain their current ecological function. The application of the DWS buffer tool to the identified wetlands resulted in a required minimum buffer of 15m. As per the Ecological Specialist Study a minimum buffer of 32m is required, which is larger than the 15m buffer as per the DWS buffer tool and can be considered as the correct buffer size for the wetlands.

Comments received will be included in **Appendix E6(a)**.

4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the BAR is submitted. The comments and responses are captured in a comments and response report as prescribed in the EIA regulations and is attached to this Final BAR as **Appendix E3**.

Comments received are included in the Comments and Responses Report contained in **Appendix E3**.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Refer to Organ of State list attached within **Appendix E5.**

Authority/Organ of State	**Contact person (Title, Name and Surname)**	**Tel No**	**Fax No**	**e-mail**	**Postal address**
Department of Agriculture, Forestry & Fisheries	Thoko Buthelezi	012-319-7634	-	thokob@daff.gov.a	Private Bag X120 Pretoria 0001

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Agriculture, Forestry & Fisheries	Mashudu Marubini	012-319--7619	-	mashuduma@daff.gov.za	Private Bag X120 Pretoria 0001
Department of Energy	The Director: Free State	057-391-1326/1300	057-352-2673	-	Private Bag X33 Welkom 9463
Department of Energy	Pheladi Masipa	012-406-7650	012-323-5819	Pheladi.Masipa@energy.gov.za	Private Bag X96 Pretoria 0001
Department of Mineral Resources	Mashudu Mulaudzi	057-391-1386	086-710-1479	mashudu.mulaudzi@dmr.gov.za	Private Bag X 33, Welkom, 9460
Department of Mineral Resources	Shawn Janneker	057-391-1356	057-357-6003	shawn.janneker@dmr.gov.za	Private Bag X 33, Welkom, 9460
Department of Mineral Resources	Meshack Mudau	082-521-8489	-	meshack.mudau@dmr.gov.za	Private Bag X 33, Welkom, 9460
Department of Mineral Resources	Azwihangwisi Nemulodi	057-391-1342	-	azwihangwisi.nemulodi@dmr.gov.za	Private Bag X 33, Welkom, 9460
Department of Mineral Resources	Selani Shitlhangu	057-391-1382	086-275-8340	salani.shitlhangu@dmr.gov.za	Private Bag X 33, Welkom, 9460
Department of Rural Development and Land Reform	Debbie Khan	012-312-9490	012-323-6072	DGOffice@ruraldevelopment.gov.za	Private Bag X833 Pretoria 0001
Department of Water and Sanitation	George Motheo	015-405-9000	015-430-8146	motheog@dwa.gov.za	PO Box 528 Bloemfontein 9300
Eskom Holdings SOC Ltd	John Geeringh	011-516-7233	086-661-4064	john.geeringh@eskom.co.za	PO Box 1091 Johannesburg

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
					2001
Free State Department of Agriculture and Rural Developmen	Thabita Mokone	051-875-1160	051-875-2271	thabita@agric.fs.gov.za	PO Box 990 Thaba Nchu 9780
Free State Department of Economic Small Business Development, Tourism and Environmental Affairs	Grace Mkhosana	051-400-4817	-	Mkhosana@detea.fs.gov.za	-
Free State Department of Police, Roads & Transportation	W.A Naude	051-409-8584	086-275-7396	naudew@freetrans.gov.za	PO Box 119 Bloemfontein 9300
Free State Provincial Heritage Resources Agency	Ntando Mbatha	051-410-4750	086-401-0431	mbatha.npz@sacr.fs.gov.za	Private Bag X20606 Bloemfontein 9300
Free State Provincial Heritage Resources Agency	L. Philip	051-410-4750	086-401-0431	mbatha.npz@sacr.fs.gov.za	-
Lejweleputswa District Municipality	Moss Mthombeni	057-353-3094	-	moss@lejwe.co.za	PO Box 2163 Welkom 9460
Lejweleputswa District Municipality	Nontsikelelo Aaron	057-353-3094	057-391-8970	-	PO Box 2163 Welkom 9460
Lejweleputswa District Municipality	Dewald Kirsten	057-391-3195	057-352-4585	dewald@lejwe.co.za	PO Box 2163 Welkom 9460
Lejweleputswa District Municipality	Archie Jonas	057-353-3094	-	archie@lejwe.co.za	PO Box 2163 Welkom 9460
Matjhabeng Local Municipality	Mothusi Lepheana	057-391-3359	057-357-4393	mothusi.lepheana@matjhabeng.co.za	PO Box 708 Welkom 9460
Matjhabeng Local Municipality	Joe Molawa	057-391-	-	joe.molawa@matjhabeng.co.za	PO Box 708 Welkom

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
		8588			9460
Matjhabeng Local Municipality	Cllr Ivan Riet	083-612-3295	-	ivanriet@gmail.com	-
National Energy Regulator of South Africa (NERSA)	Andile Gxasheka	012-401-4775	012-401-4700	andile.gxasheka@nersa.org.za	PO Box 40343 Arcadia 0007
National Nuclear Regulator	Patle Mohajane			PEMohajane@nnr.co.za	
South African Civil Aviation Authority	Lizell Stroh	011-545-1232	011-545-1282	strohl@caa.co.za	Private Bag X73 Halfway House 1685
South African Heritage Resources Agency (SAHRA)	Andrew Salomon	021-462-4502	-	asalomon@sahra.org.za	-
Square Kilometre Array (SKA): South Africa	Adrian Tiplady	011-442-2434	-	atiplady@ska.ac.za	-
Telkom SA Limited	Amanda Bester	051-401-6260	-	WayleaCR@telkom.co.za	-
Telkom SA Limited	Leonard Shaw	012-311-2012	012-311-1686	shawls@telkom.co.za	-

Include proof that the Authorities and Organs of State received written notification of the proposed activities as Appendix E2.

Proof that the Authorities and Organs of State received written notification of the proposed project is included in **Appendix E2.**

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public

participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs is included as **Appendix E5**.

Copies of all correspondence and minutes of all meetings held to date are included in **Appendix E6(b).**

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

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

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

As a result of the alternative site, located on the Farm Rheederpark 443, being covered by approximately 70% of wetland flat, leaving insufficient space available for the facility, it is no longer considered as a viable site alternative for the development of the Harmony PV Solar Facility, from an ecological perspective (refer to **Appendix D1**), and must be excluded from the site alternative considerations. The impact assessment (followed below) will thus only assess impacts associated with the development of the proposed facility on the preferred site, located on the remaining extent of the Farm Rietpan 17.

Preferred Site Impact Assessment

Activity	Impact summary	Significance after mitigation	Proposed mitigation
Upgrading and/or creation of site access road and internal maintenance tracks	***Direct impacts:*** » Loss of vegetation. » Increase in runoff and erosion. » Possible change of natural runoff and drainage patterns. » Possible loss of protected species. » Possible permanent loss of vegetation potential of soil surface. » Possible disturbance and reduction of habitat or injury to burrowing vertebrates » possible distribution of alien invasive species	Low	» A permit from the provincial conservation authority for the removal/relocation of protected plant species will need to be applied for. » During construction: create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas » Keep the clearing of semi-natural grasslands to a minimum » If filling material is to be used, this should be sourced from areas free of invasive species » Topsoil (at least the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil » Reinforce portions of existing access routes that are prone to erosion, create structures or low banks to drain the access road rapidly during rainfall events, yet preventing erosion of the track and surrounding areas » Ensure that runoff from compacted or sealed surfaces is slowed down and
	Indirect impacts: None	-	
	Cumulative impacts: » Possible erosion of areas lower than the access road, possible contamination of lower-lying wetlands to the east due to oil or other spillage. » Possible spread and establishment of alien invasive species.	Low	
	Residual impacts: » Altered vegetation composition and structure. » Altered topsoil conditions. » Potential barren areas. » Potential for erosion and invasion by weed or alien species.	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			dispersed sufficiently to prevent accelerated erosion from being initiated (storm water and erosion management plan required) » Exclude all seepage wetlands from this activity. A minimum buffer zone of 32 m should be placed around all seepage areas. » Prevent leakage of oil or other chemicals or any other form of pollution » Monitor the establishment of (alien) invasive species and remove as soon as detected, whenever possible before regenerative material can be formed » After decommissioning, if access road or portion thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program
Fencing of the project site– which may also serve as a maintenance track/minor internal road to the PV panels and as a possible fire-break	***Direct impacts:*** » Loss of vegetation and protected species. » Window of opportunity for the establishment of alien invasive species. » Altered topsoil characteristics prone to capping. » Increased runoff and erosion. » Possible reduction of habitat and forage availability to terrestrial vertebrates and	Low	» Minimise area affected, especially during construction. » A permit from the provincial conservation authority for the removal/relocation of protected plant species will need to be applied for. » During construction: strictly prohibit any off-road driving or parking of vehicles and machinery outside the footprint areas. » Prevent leakage of oil or other chemicals,
	Indirect impacts:	-	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	None		strictly prohibit littering of any kind. » Monitor the establishment of alien and indigenous invasive species and remove using appropriate measures as soon as detected, whenever possible *before* regenerative material can be formed. » If the area is to be used as fire-break, maintain a suitably low grass layer by regular mowing or appropriate species selection, but do not leave soil bare. Alternatively, ensure that the soil has a covering that prevents erosion. » Animal burrows must be monitored by an ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » During the design phase, the possible impact of burrowing vertebrates (ground squirrels) on the development must be determined, and fencing must be designed to either exclude such fauna if it will be detrimental or enable occasional migration of smaller vertebrates onto and across the site (which could be beneficial to small vertebrate populations)
	Cumulative impacts: » Possible erosion of cleared areas and associated accelerated erosion within surrounding areas. » Possible loss of ecosystem functioning due to increase in invasive species.	Low	
	Residual impacts: » Altered vegetation composition. » Compacted topsoils. » Possibility for erosion and invasion by alien invasives.	Low	
Construction and operation of fixed PV	***Direct impacts:*** » Loss of vegetation and/or species of conservation	Medium	» A permit from the provincial conservation authority for the removal/relocation of

Activity	Impact summary	Significance after mitigation	Proposed mitigation
panels on semi-natural vegetation and disturbed areas.	concern. » Loss of and alteration of microhabitats. » Impacts on wetland areas » Strongly altered and reduced vegetation cover. » Site-specific altered distribution of rainfall and resultant runoff patterns. » Increase in concentrated runoff from PV panels and potential for accelerated erosion. » Reduction of habitat and resource availability for terrestrial fauna. » Possible increase of detrimental effects during periods of extreme weather events, e.g. flooding. » Severe erosion or dust due to lower buffering capacity of sparser vegetation.		protected plant species will need to be applied for. » Animal burrows must be monitored by ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » Keep areas affected to a minimum. Strictly prohibit any disturbance outside the demarcated footprint area. » Clear as little grassland vegetation as possible. Aim to maintain all indigenous vegetation where it will not interfere with the construction or operation of the development. » Rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMPr. » Use species that were part of the original indigenous species composition but with high percentage of *Themeda triandra* whilst *Digitaria eriantha* and *Panicum coloratum* can also be included. It is expected that the *Cynodon dactylon*, *Eragrostis lehmanniana* and *Eragrostis chloromelas* will re-establish itself. » The higher level of shading anticipated from fixed panels may prevent or slow the re-establishment of desirable grass
	Indirect impacts: None	-	
	Cumulative impacts: If mitigation measures are not strictly followed the following could occur: » erosion of areas around the panels and continued erosion of the development area with associated siltation and/or erosion of depression wetland. » contamination of the wetlands. » alteration of occupancy by terrestrial fauna, » possible reduction of available habitat and food availability to terrestrial fauna » spread and establishment of invasive species	Medium	
	Residual impacts:	Medium	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	» Altered topsoil characteristics. » Altered vegetation composition.		species. Thus re-establishment must be monitored and species composition adapted if the above species fail to establish sufficiently. » Aim to maintain a buffer zone of a minimum of 32 m around the seepage area. » Remove all invasive vegetation before and after construction and continuously up to decommissioning. » If filling material is to be used, this should be sourced from areas free of invasive species. » Topsoil (at least the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil. » Temporarily stored topsoil must be re-applied within 6 months, topsoils stored for longer need to be managed according to a detailed topsoil management plan. » Due to the fixed nature and larger runoff surfaces of the PV panels, the development area should be adequately landscaped and rehabilitated to include vegetated contour buffer strips that can contain expected accelerated erosion

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			» Runoff may have to be specifically channeled or stormwater adequately controlled to prevent localised rill and gully erosion. » Prevent leakage of oil or other chemicals, strictly prohibit littering of any kind. » Monitor the establishment of all invasive species and remove as soon as detected, whenever possible before regenerative material can be formed.
Construction of a short 11KV power line as part of the grid connection	***Direct impacts:*** » Loss of vegetation. » Increase in runoff and erosion. » Disturbance of burrowing animals. » possible collision or electrocution of birds	Low	» A permit from the provincial conservation authority for the removal/relocation of protected plant species will need to be applied for. » Animal burrows must be monitored by ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » During construction: create designated servitude areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas. » Limit clearing of indigenous vegetation to pylon positions only. » Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. » Monitor the establishment of invasive
	Indirect impacts: None	-	
	Cumulative impacts: » Possible erosion of surrounding areas if no mitigation is implemented. » Contamination of wetlands. » No major cumulative impact on flora or fauna expected (excluding avifauna)	Low	
	Residual impacts: » Very localised alteration of soil surface characteristics.	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			species and remove as soon as detected, whenever possible before regenerative material can be formed. » The final route of the line should be planned to avoid any construction or placement of pylons within the seepage wetland. » A buffer zone of 32 m should be placed around the seepage area » No Pylons may be placed within the wetland or buffer zone. » Eskom has guidelines and standards for the construction of 'bird friendly' pole and pylon structures to be adhered to. It is recommended that the structure used include the standard Eskom Bird Perch installed on all pole tops to provide safe perching substrate for birds, well clear of all dangerous hardware. » The high risk sections of this power line must be installed with suitable, Eskom approved anti bird collision line marking devices. The most common bird marking devices include Bird Flight Diverters and Bird Flappers, both of which are very effective, however in South Africa, Bird Flappers have proven to be more so. Either Eskom or BBEntropie (whoever maintains the line) will be responsible for

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			ensuring that these devices are in working order, and replacing them if not.
Construction of substation and other electricity-related buildings, workshops, offices, guardhouses, etc.	***Direct impacts:*** » Loss of vegetation and/or species of conservation concern. » Loss of microhabitats. » Altered and reduced vegetation cover. » Altered distribution of rainfall and resultant runoff patterns. » Increase in *concentrated* runoff from sealed surfaces and possibly higher accelerated erosion. » Reduction of habitat and resource availability for terrestrial fauna	Low	» A permit from the provincial conservation authority for the removal/relocation of protected plant species will need to be applied for. » Animal burrows must be monitored by ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » Maintain a minimum buffer of 32 m from the seepage wetland. » Limit disturbance to footprint area as far as practically possible. » Place infrastructure as far as possible on sites that have been transformed already. » During construction: stay within demarcated footprint areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas.
	Indirect impacts: None	-	» Prevent spillage of construction material and other pollutants, contain and treat any spillages immediately. » Topsoil (at least the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it
	Cumulative impacts: » If mitigation measures are not strictly followed the following could occur: • erosion of areas around sealed surfaces and continued erosion of the development area	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	and erosion of lower-lying seepage areas • contamination of wetlands • spread and establishment of invasive species » Alteration of occupancy by terrestrial fauna, small reduction of available habitat and food availability to terrestrial fauna.		separately until it can be re-applied, minimise the handling of topsoil. » Temporarily stored topsoil must be re-applied within 6 months, topsoils stored for longer need to be managed according to a detailed topsoil management plan.
	Residual impacts: » Altered topsoil characteristics. » Altered vegetation composition.	Low	» Rehabilitate and re-vegetate all areas outside footprint area that have been disturbed. » After decommissioning remove all foreign material prior to starting the rehabilitation. » The rehabilitation plan for all temporarily affected areas and for the development area after decommissioning must aim to re-introduce all non-weed indigenous species listed in the specialist report as a minimum. Re-seeding should include a high percentage of *Themeda triandra* whilst *Digitaria eriantha* and *Panicum coloratum* can also be included. It is expected that the *Cynodon dactylon, Eragrostis lehmanniana* and *Eragrostis chloromelas* will resettle itself. » Monitor the establishment of invasive species and remove using appropriate methods as soon as detected, whenever possible before regenerative material can be formed.
Temporary construction	***Direct impacts:***	Low	» A permit from the provincial conservation

Activity	Impact summary	Significance after mitigation	Proposed mitigation
camps and sites where machinery is kept during construction	» Loss of vegetation and/or species of conservation concern. » Loss of microhabitats. » Altered vegetation cover. » Altered distribution of rainfall and resultant runoff patterns. » Increase in concentrated runoff from sealed or compacted surfaces and possibly higher accelerated erosion. » Reduction of habitat and resource availability for terrestrial fauna. » Possible contaminated topsoil. » Possible contaminated wetlands.		authority for the removal/relocation of protected plant species will need to be applied for. » Animal burrows must be monitored by ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » Exclude high sensitivity zones from this activity. » Maintain a minimum buffer of 100 m from, seepage area » Place infrastructure as far as possible on sites that have been transformed already. » Stay within demarcated temporary construction areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas. » Prevent spillage of construction material and other pollutants. Contain and treat any spillages immediately. Strictly prohibit any pollution/littering according to the relevant EMPr. » No fires may be made for cooking or any other purposes, except where fire breaks may be required. In this instance, fires may only be made under appropriate conditions and supervision. » Facilities may not be used as staff
	Indirect impacts: None	-	
	Cumulative impacts: » If mitigation measures are not strictly followed the following could occur: • erosion of the development area and lower-lying wetlands • contamination of wetlands • spread and establishment of invasive species.	Low	
	Residual impacts: » Altered topsoil characteristics. » Altered vegetation composition.	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			accommodation. » Topsoil (at least the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil. » Temporarily stored topsoil must be re-applied within 6 months, topsoils stored for longer need to be managed according to a detailed topsoil management plan. » After construction remove all foreign material prior to starting the rehabilitation. » The rehabilitation plan for all temporarily affected areas must aim to re-introduce all non-weed indigenous species listed in the specialist report as a minimum, taking the observed original cover percentages as a guideline of acceptable vegetation cover. » Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed.
Topsoil stockpiles that may be required during or after construction	***Direct impacts:*** » Loss of vegetation and/or species of conservation concern. » Loss of microhabitats. » Altered vegetation cover. » Altered distribution of rainfall and resultant runoff	Low	» A permit from the provincial conservation authority for the removal/relocation of protected plant species will need to be applied for. » Animal burrows must be monitored by ECO prior to construction for activity/presence

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	patterns. » Possibly higher accelerated erosion. » Possible loss of topsoil resources. » Reduction of habitat and resource availability for terrestrial fauna.		of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor. » Exclude high sensitivity zones from this activity. » Maintain a minimum buffer of 100 m from the seepage wetland. » Stay within demarcated areas and access routes for extraction and/or movement of materials. » Strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas. » Prevent spillage of pollutants, contain and treat any spillages immediately, strictly prohibit any pollution. » Topsoil (at least the upper 25 cm of soil) is an important natural resource; where it must be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil, manage stored topsoil according to a dedicated topsoil management plan. » Temporarily stored topsoil must be re-applied within 6 months; topsoils stored for longer need to be managed according to a detailed topsoil management plan. » Monitor erosion of areas and control where
	Indirect impacts: None	-	
	Cumulative impacts: » If mitigation measures are not strictly followed the following could occur: • continued erosion of the altered surfaces and of lower-lying seepages • contamination of wetlands • spread and establishment of invasive species » Alteration of occupancy by terrestrial fauna, small reduction of available habitat and food availability to terrestrial fauna.	Low	
	Residual impacts: » Altered topsoil characteristics. » Altered vegetation composition.	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
			necessary through the implementation of appropriate erosion control measures. » After construction remove all foreign material prior to starting the rehabilitation. » The rehabilitation plan for all temporarily affected areas must aim to re-introduce all non-weed indigenous species listed in the specialist report as a minimum. » The rehabilitation plan for all temporarily affected areas and for the development area after decommissioning must aim to re-introduce all non-weed indigenous species listed in the specialist report as a minimum. Re-seeding should include a high percentage of *Themeda triandra* whilst *Digitaria eriantha* and *Panicum coloratum* can also be included. It is expected that the Cynodon dactylon, Eragrostis lehmanniana and Eragrostis chloromelas will resettle itself. » Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed.
Transport of materials to site, movement of vehicles on site during construction and maintenance	***Direct impacts:*** » Loss of vegetation. » Increase in runoff and erosion. » Disturbance or possible mortality incidents of terrestrial fauna.	Low	» Strictly restrict all movement of vehicles and heavy machinery to permissible areas, these being designated access roads, maintenance roads, turning points and parking areas. No off-road driving beyond

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	» Possible contamination of soil and groundwater by oil- or fuel spillages. » Possible establishment and spread of undesirable weeds and alien invasive species that could further damage ecosystem functionality.		designated areas may be allowed. » Parking areas should be regularly inspected for oil spills and covered with an impermeable or absorbent layer (with the necessary stormwater control) if oil and fuel spillages are highly likely to occur. » Strict speed limits must be set and adhered to on site. » Driving between dusk and dawn should be restricted to emergency situations only. » Prevent spillage of any, oils or other chemicals, strictly prohibit other pollution. » Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed, destroy all material to prevent re-establishment.
	Indirect impacts: None	-	
	Cumulative impacts: » Possible pollution of surrounding areas if no mitigation is implemented. » Possible spread of alien invasive species beyond the site if no mitigation is implemented.	Low	
	Residual impacts: » Related to access roads and internal maintenance tracks only.	Low	
PV array *components* and their continued maintenance and eventual decommissioning: regular washing and possible breakage of panels	***Direct impacts:*** » Localised increase in runoff and accelerated erosion. » Possible release of toxic substances and/or heavy metals and associated contamination of soil and groundwater. » Possible contamination and damage to terrestrial fauna by broken PV panels/infrastructure	Low	» Where panels need to be washed, no polluting chemicals may be used, and the use of water should be minimal as well. » Where water is used for washing, monitor areas around the PV arrays for signs of accelerated erosion and establishment of weeds or alien invasive species and manage according to the erosion- and invasive species management plan. » Prior to construction and up to decommissioning, clear instructions must be drafted and at all times available on site
	Indirect impacts: None	-	
	Cumulative impacts: » Possible pollution of surrounding areas if no	Low	

Activity	Impact summary	Significance after mitigation	Proposed mitigation
	mitigation is implemented » Possible increase in and spread of alien invasive species beyond the site if no mitigation is implemented.		on how any breakages of PV panels will be dealt with, including the correct salvage, disposal and preferably also recycling methods (or possibilities) for any broken materials.
	Residual impacts: » None expected if mitigation measures are implemented	-	
Pre-Construction and Construction activities can have a negative impact on heritage resources	***Direct impacts:*** None	Low	As no heritage resources were discovered and the proposed PV facility will have no impact on the heritage of the site. Thus no mitigation measures are required. If during the construction phase archaeological and/or palaeontological resources are discovered, all construction operations need to be paused and an archaeologist and/or palaeontologist needs to be appointed for further investigation and study.
	Indirect impacts: None	Low	
	Cumulative impacts: Archaeological, palaeontological and cultural sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.	Low	
	Residual impacts: None	-	
Alternative 2: N/A			
Alternative 3: N/A			

A complete impact assessment in terms of Appendix 1 of GN R.982 has been included as **Appendix F**.

2. ENVIRONMENTAL IMPACT STATEMENT

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

As a result of the alternative site, located on the Farm Rheederpark 443, being covered by approximately 70% of wetland flat it is no longer considered as a viable site alternative for the development of the Harmony PV Solar Facility (from an ecological perspective, refer to **Appendix D1**) and is recommended to be excluded from the site alternative considerations. The impact statement (followed below) will thus only refer to impacts associated with the development of the proposed facility on the preferred site, located on the remaining extent of the Farm Rietpan 17.

Preferred Site

The proposed activities assessed within this Basic Assessment Report are required to provide essential infrastructure associated with the development of the Harmony Nyala PV Solar Facility, Free State Province. In summary, this Basic Assessment has assessed potential impacts and identified appropriate management and mitigation measures. No environmental fatal flaws and no significant negative impacts have been identified to be associated with the proposed project provided the recommended mitigation and management measures are implemented.

Environmental costs can be expected to arise as a result of the project proceeding. This could include:

» Possible disturbance of wetlands on site. Changes to the preferred site have been included within the facility design in order to ensure that the wetland will not be impacted on by the proposed PV Solar Facility. A buffer of 32 meters has also been included around the wetland, as per the ecology specialist recommendation to avoid any disturbance and further degradation of this sensitive area.
» Direct loss of vegetation and faunal habitat due to the clearing of land and vegetation for the development of the proposed Harmony Nyala PV Solar Facility. This impact can be reduced through the minimisation of vegetation clearance as far as possible.

These costs are expected to occur at a local and site level and are considered acceptable provided the mitigation measures as outlined in this Basic Assessment and the EMPr are implemented.

Benefits of the project include the following:

» The proposed project is located on a site which has been historically transformed, with little to no remaining natural vegetation. Therefore, there will be limited impacts on natural ecosystems as a result of the development of the project.
» The proposed PV Solar Facility will result in important economic benefits at the local and regional scale through job creation, procurement of materials and provision of services and other associated downstream economic development. These will extend beyond the site and would be experienced at a local and regional scale.
» The use of renewable resources for the development of electricity will contribute to a reduction in environmental impacts at a broader scale. The generation of clean/green electricity encourages environmental health as well as local upliftment in the affected communities.
» A reduction of pressure on the national electricity (Eskom) grid will occur due to the reduced pressure to supply electricity to the Harmony Nyala Mine.
» The direct dependency of the Harmony Nyala Mine on the national grid to supply energy will be reduced. This will result in operations within the mine to run more smoothly, especially when the national grid is put under pressure to provide electricity to all parties.
» The development of the proposed project will contribute towards the reduction in the carbon footprint of the mine.

Benefits of the project extend beyond the boundaries of the site and are expected to be experienced at a local, regional and national level. The benefits of the project are expected to outweigh the costs. The development of the proposed project is therefore considered to be sustainable from an environmental perspective.

Alternative B: N/A

Alternative C: N/A

No-go alternative (compulsory)

The 'do-nothing' alternative is the option of not constructing the Harmony Nyala PV Solar Facility. This alternative would result in no new environmental impacts on the site or surrounding areas. Due to the transformed nature of the site as a result of historic anthropogenic activities, the potential for impacts on the site is considered to be low with development, and therefore the do nothing alternative has little benefit to the current environment.

BBEntropie is proposing the establishment of a solar energy facility within the Harmony Gold Mining Company mining area for the purpose of reducing total carbon emissions and diversifying electricity supply to the Harmony Nyala Mine (exclusive user of the power). Should the facility not be constructed, Harmony Gold Mining Company's reliance on fossil-fuel based power as a sole-source of power to the plant will continue

and the demand on Eskom's electricity supply will increase over time.
Failure to establish an exclusive power supply source for the Harmony Nyala Mine would also result in a constant demand of power to be supplied from Eskom, which will add pressure on the grid infrastructure in the region (and would require the additional consumption of fossil fuels to achieve the same level of electrical supplied to the mine).
The electricity demand in South Africa is placing increasing pressure on the country's existing power generation capacity. There is, therefore, a need for additional electricity generation options to be developed throughout the country.

The support for renewable energy policy is guided by the need to address climate change as well as a rationale that South Africa has a very attractive range of renewable resources, particularly solar and wind and that renewable applications are in fact the least-cost energy service in many cases - and more so when social and environmental costs are taken into account. The generation of electricity from renewable energy in South Africa offers a number of socio-economic and environmental benefits. These benefits include:

» *Exploitation of our significant renewable energy resource:* At present, valuable national resources including biomass by-products, solar radiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio.
» *Pollution reduction:* The releases of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
» *Climate friendly development:* The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of greenhouse gas (GHG) emissions. South Africa is estimated to be responsible for ~1% of global GHG emissions and is currently ranked 9th worldwide in terms of per capita CO_2 emissions.
» *Employment creation:* The sale, development, installation, maintenance, and management of renewable energy facilities have significant potential for job creation in South Africa.
» *Acceptability to society:* Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human and ecosystem health and climate friendly development.
» *Support to a new industry sector:* The development of renewable energy offers the opportunity to establish a new industry within the South African economy.

The 'do nothing' alternative will not assist the Harmony Gold Mining Company in addressing issues such as diversifying their electricity supply at the Harmony Nyala Mine and reducing the total carbon emissions from the operations. As detailed above, the benefits associated with the construction of the proposed facility outweigh the

costs, and the project is therefore considered to be sustainable. The costs of the **'do nothing alternative'** are expected to outweigh the benefits and**, therefore, this alternative is not a preferred alternative.**

SECTION E. RECOMMENDATION OF PRACTITIONER

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

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

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

The following mitigation and management measures should be implemented:

- The slope seepage wetland, located in close proximity to the project site should be considered as a no-go area where no activities or development may take place. For the protection of the wetland a recommended 32 meter buffer (no-go area) should be placed around the wetland area.
- No power line pylons may be placed within a wetland area.
- A stormwater management and erosion control plan as well as a rehabilitation plan should be developed and implemented.
- Limit vegetation clearance a far as possible and restrict construction activities to designated construction areas.
- An alien plant control programme should be initiated as part of the development, as to ensure that alien invasive species will not spread across the site.
- If during the construction phase an archaeological and/or palaeontological resource is discovered, all construction operations need to be paused and an archaeologist and/or palaeontologist needs to be appointed for further investigation and study.
- It is recommended that the proposed development receive authorisation as the benefits of the facility will exceed the costs. The facility will contribute to the surrounding communities as limited job opportunities will be created and will contribute to the overall welfare of society as the use of non-renewable resources for the generation of power will be reduced. The Harmony Gold Mining Company will also have the opportunity to diversify their electricity supply and reduce their dependency on the national electricity grid for power, while simultaneously reducing the power supply pressure for Eskom.

As a result of the alternative site, located on the Farm Rheederpark 443, being covered by approximately 70% of wetland flat it is no longer considered as a viable site alternative for the development of the Harmony Nyala PV Solar Facility, from an ecological perspective (refer to **Appendix D1**), as the remaining available area outside

of the sensitive area is considered as insufficient for development. It is thus recommended that the preferred site, located on the remaining extent of the Farm Rietpan 17, be authorised for the development of the facility.

Is an EMPr attached? **YES**

The EMPr must be attached as **Appendix G**.

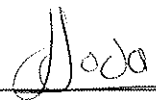
The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as **Appendix H**.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in **Appendix I**.

Any other information relevant to this application and not previously included must be attached in Appendix J.

KAREN JODAS

NAME OF EAP



SIGNATURE OF EAP

8 December 2015

DATE

SECTION F: APPENDICES

The following appendices are attached:

Appendix A: Maps
- » Appendix A1: Locality map
- » Appendix A2: Facility layout maps
- » Appendix A3: Sensitivity maps
- » Appendix A4: Coordinates

Appendix B: Site Photographs

Appendix C: Facility Illustration(s)

Appendix D: Specialist(s)
- » Appendix D1: Ecological specialist study
- » Appendix D2: Archaeological specialist study
- » Appendix D3: Palaeontological specialist study

Appendix E: Record of Public Involvement Process
- » Appendix E1: Advertisements and Site Notices
- » Appendix E2: Proof of stakeholder consultation
- » Appendix E3: Comments and Response Report
- » Appendix E4: Authority Consultation
- » Appendix E5: I&AP Database
- » Appendix E6(a): Comments received
- » Appendix E6(b): Meeting Minutes

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme

Appendix H: EAP Affirmation and CV's

Appendix I: Specialist Declarations and CV's