DRAFT BASIC ASSESSMENT REPORT

for

BULSKOP PV

On

Farm 423 Portion 0.

In terms of the

National Environmental Management Act (Act No. 107 of 1998, as amended) & 2014 Environmental Impact Regulations

Prepared for Applicant: Bulskop PV (Pty) Ltd.

Date: 13 April 2022

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Report Reference: BEA200/04

Department Reference: 2021-10-0018 (Pre-Application Reference)

Case Officer: Mr Lunga Dlova

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REVISION	DATE	AUTHOR
Draft Basic Assessment Report	13 April 2022	Dale Holder
Final Basic Assessment Report	Pending	Dale Holder
Draft Environmental Management Programme	13 April 2022	Dale Holder
Final Environmental Management Programme	Pending	Dale Holder

APPROVAL FOR RELEASE

NAME	TITLE	SIGNATURE
Dale Holder	Senior Environmental Practitioner	

DISTRIBUTION

DISTRIBUTION LIST
Department of Forestry, Fisheries and the Environment
Bulskop PV (Pty) Ltd
Registered and Potential Interested and Affected Parties

SUBMISSION AND CORRESPONDENCE

SUBMISSION / CORRESPONDENCE	DATE
Application form Submitted	13 April 2022
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Draft Basic Assessment Report Submitted	13 April 2022
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Comment on Draft Basic Assessment Report	Pending
Final Basic Assessment Report Submitted	Pending

APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONER:
Cape EAPrac Environmental Assessment Practitioners PO Box 2070 George 6530 Tel: 044-874 0365 Fax: 044-874 0432 **Report written & compiled by:** Dale Holder (Ndip Nature Conservation), who has over 16 years' experience as an environmental practitioner. **Registrations:** Director, Louise-Mari van Zyl (MA Geography & Environmental Science [US]; Registered Environmental Assessment Practitioner with the Interim Certification Board for Environmental Assessment Practitioners of South Africa, EAPSA). Ms van Zyl has over fifteen years' experience as an environmental practitioner.

PURPOSE OF THIS REPORT:
I&AP Review and Comment

APPLICANT:
Bulskop PV (Pty) Ltd

CAPE EAPRAC REFERENCE NO:
BEA700/04

DEPARTMENT REFERENCE:
2021-10-0018 (Pre-Application Reference)

SUBMISSION DATE:
13 April 2022

DRAFT BASIC ASSESSMENT REPORT

in terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) & Environmental Impact Regulations2014 (as amended)

Bulskop PV

Farm 423 Portion 0.

Submitted for:

Stakeholder Review & Comment

Report Issued by:

Cape Environmental Assessment Practitioners

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REPORT DETAILS

Title:	Draft Basic Assessment Report for Bulskop PV
Purpose of this report:	This Draft Basic Assessment Report is made available to all registered and potential Interested and Affected Parties (I&APs) for review and comment and all comments received will be incorporated into the Final Basic Assessment Report that will be submitted to the competent authority for decision making. This BAR forms part of a series of reports and information sources that are being provided during the Basic Assessment Process for the proposed Bulskop PV near Beaufort West in the Western Cape Province. Registered I&APs will be given an opportunity to comment on the following reports as part of this environmental process: - Draft Basic Assessment Report, - All Specialist Studies, and - Draft Environmental Management Programme. In accordance with the regulations, the objectives of an environmental process are to, through a consultative process: (a)identify the relevant policies and legislation relevant to the activity; (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location; (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process; (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment; (e) identify the key issues to be addressed in the assessment phase; (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and (g) identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored. The Draft Basic Assessment Report is available to all registered and potential interested and affected parties for a 30-day review and comment period extending from **13 April 2022** – **19 May 2022**. All comments received during this comment period will be incorporated into the Final BAR that will be submitted to the DFFE for Decision making.
Prepared for:	Bulskop PV (Pty) Ltd
Published by:	Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)
Authors:	Mr Dale Holder
Cape EAPrac Ref:	BEA700/04
DEA Case officer & Ref. No:	Mr Lunga Dlova - 2021-10-0018 (Pre-application reference number)
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TECHNICAL CHECKLIST

The following technical checklist is included as a quick reference roadmap for the proposed project.

Applicant Details		
Applicant Details	Applicant Name:	Bulskop PV (Pty) Ltd Bulskop PV (Pty) Ltd is a Special Purpose Vehicle (SPV) incorporated for the sole purpose of developing, constructing, and operating a proposed 120 MW solar PV facility and associated infrastructure located on the Farm 423 Portion 0.
	Company Registration Number:	2021/859652/07
	BBBEE Status:	NA
	Project Name:	Bulskop PV
Site Details		
Size of the property	Description and Size in hectares of the affected property.	Farm 423 Portion 0. Total Property Size: 2667.0374 ha
Size of the study area	Size in ha of initial study area.	2667.0374 ha (The entire farm portion formed part of the study site)
Development Footprint	This includes the total footprint of PV panels, auxiliary buildings, onsite substation, inverter stations and internal roads.	Approximately 268 ha
Technology Details		
Capacity of the facility	Capacity of facility (in MW)	Net generation (contracted) capacity of up to 120 MWac
Solar Technology selection	Type of technology	• Solar photovoltaic (PV) technology (monofacial or bifacial) with fixed, single or double axis tracking mounting structures, as well as associated infrastructure, which will include: • Laydown area; • Access and Internal Road network; • Auxiliary buildings (33 kV switch room, gatehouse and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.); • Facility substation; • Inverter-stations, transformers and internal electrical reticulation (underground cabling); • Battery Energy Storage System (BESS); • Rainwater Tanks; and • Perimeter fencing and security infrastructure.
	Structure height	Solar panels with a maximum height of ± 5.5 m above the ground
	Surface area to be covered (including associated infrastructure such as roads)	Approximately 268 ha
	Structure orientation	Fixed-tilt: north-facing at a defined angle of tilt Single or double axis tracking: mounted in a north-south orientation, tracking from east to west.

	Laydown area dimensions	Approximately 2-5 ha laydown area will be required for the PV facility (the laydown areas will not exceed 5 ha and will be situated within the assessed footprint).
Storage Solution	BESS	Battery Energy Storage System (BESS). Area: up to ± 4 ha Capacity: Unspecified Technology: solid-state/ non-liquid type batteries.
Own-Build Grid Connection		
	Size and capacity of on-site substation	The maximum size of the facility substation will not exceed 1 ha. The facility substation will collect the power from the facility and transform it from medium voltage (up to 33 kV) to high voltage (132 kV). The facility will include inverter-stations, transformers, switchgear and internal electrical reticulation (underground cabling) and lightning conductors up to 21 m. The on-site substation will connect directly to the proposed Bulskop Collector Switching Station[1].
	Length and capacity of on-site powerlines / cabling.	
Auxiliary Infrastructure		
Other infrastructure	Additional Infrastructure	Auxiliary buildings of approximately 1 ha, including (but not limited to) a 33 kV switch room, a gate house, ablutions, workshops, storage and warehousing areas, site offices and a control centre. Rainwater tanks; and Electrified perimeter fencing not exceeding 5 m in height.
	Details of access roads	The access roads will not exceed 8 m in width. The access road will comprise of a new road, as well as the expansion of sections of the existing farm road.
	Details of internal roads	A network of gravel internal access roads, each with a width of up to ± 5 m, will be constructed to provide access to the various components of the facility.
	Extent of areas required for laydown of materials and equipment	Approximately 2-5 ha of temporary laydown areas will be required (laydown areas will not exceed 5 ha). A permanent laydown area of a maximum of a 1 ha will remain for operations.

The Applicant, Bulskop PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Bulskop PV) located on the Remaining Extent (Portion 0) of Farm 423 approximately 12 km south-east of Beaufort West in the Western Cape Province. The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the Beaufort West Local Municipality within the Central Karoo District Municipality.

Five additional 120 MW PV facilities are concurrently being considered on the property and are assessed through separate Basic Assessment processes, namely:

- Hardeveld PV;
- Rosenia PV;
- Hoodia PV;
- Salsola PV; and
- Gamka PV.

[1] Bulskop Collector Switching Station and the overhead powerline to the Droerivier MTS is being assessed in a separate BA

A development footprint of approximately 268 ha is being assessed as part of this Basic Assessment Report (BAR) and the infrastructure associated with the 120 MW facility includes:

- PV modules and mounting structures;
- Inverters and transformers;
- Cabling;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8 m wide);
- Auxiliary buildings (33 kV switch room, gatehouse and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Perimeter fencing and security infrastructure;
- Rainwater tanks;
- Temporary and permanent laydown areas;
- Facility substation.
- Own-build grid connection solution, including an on-site substation.

The Bulskop PV facility intends to connect to the National Grid via the Droerivier Main Transmission Substation (MTS) (approximately 17.5 km west of the facility), however, the grid connection infrastructure associated with this grid solution is being assessed as part of a separate Environmental Process.

LOCATION OF PREFFERED ALTERNATIVE[2]

The co-ordinates of the preferred alternative are reflected in the table below.[3]

Layout Alternative 1 (Preferred)	Latitude	Longitude
North-West Corner	32°24'11.60"S	22°42'57.91"E
North-East Corner	32°24'4.69"S	22°44'16.50"E
South-West Corner	32°24'17.49"S	22°42'58.05"E
South-East Corner	32°25'14.24"S	22°44'30.46"E

Access Road	Latitude	Longitude
Start	32°23'57.38"S	22°40'15.49"E
Middle	32°24'22.80"S	22°41'01.51"E
End	32°24'16.92"S	22°43'2.50"E

CONTENTS OF A BASIC ASSESSMENT REPORT.

Appendix 1 of Regulation 326 of the 2014 EIA Regulations (as amended) contains the required contents of a Basic Assessment Report. The checklist below serves as a summary of how these requirements were incorporated into this Basic Assessment Report.

Requirement	Details
(1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include -	

[2] Th footprint of Bulskop PV is not rectangular. The co-ordinates reflected in this table indicate the corner points that are furthest east and west

[3] This Basic Assessment Process includes the IPP portion of the on-site substation only. The powerline and remainder of infrastructure needed to connect this facility to the national grid is being considered as part of a separate basic assessment process.

Requirement	Details
(a) Details of - The EAP who prepared the report; and The expertise of the EAP, including, a curriculum vitae.	The report was compiled by Dale Holder of Cape EAPrac. The author has 18 years' experience as an EAP and holds a ND Nature Conservation qualification. The CV of the EAP and Company Profile is included as Annexure J4 of this report.
(b) The location of the activity, including – The 21-digit Surveyor General code of each cadastral land parcel; Where available, the physical address and farm name; Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	C09090000000042300000 ±12 km Southeast of Beaufort West in the Western Cape North-West Corner 32°24'11.60"S 22°42'57.91"E North-East Corner 32°24'4.69"S 22°44'16.50"E South-West Corner 32°24'17.49"S 22°42'58.05"E South-East Corner 32°25'14.24"S 22°44'30.46"E
(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	Refer to Appendix A and B of this report.
(d) a description of the scope of the proposed activity, including - All listed and specified activities triggered and being applied for; and A description of the activities to be undertaken including associated structures and infrastructure.	The relevant listed activities are captured in Section 3.1.2 The description of the activity is provided in Section 2 of this report with graphic representation provided in Appendix B.
(e) A description of the policy and legislative context within which the development is proposed, including – An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and . How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments.	Please refer to Section 3 of this document.
(f) A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	Please refer to Section 2.2 of this document.
(g) A motivation for the preferred site, activity and technology alternative.	The preferred alternative has been identified as the best practicable option and is discussed in detail in section 2.4 of this report.
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - • Details of all alternatives considered; • Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; • A summary of the issues raised by interested and affected parties, and an indication of the manner in	Section 2.4 addresses feasible and reasonable alternatives which were identified for facility. Site, layout and technological alternatives were considered. Details of Public Participation are included in section 8 of the report. A summary of all issues raised by I&APs as well as the responses thereto are included in Appendix F.

Requirement	Details
which the issues were incorporated, or the reasons for not including them; • The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; • The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated. • The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; • Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; • The possible mitigation measures that could be applied and level of residual risk; • The outcome of the site selection matrix; • If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and • A concluding statement indicating the preferred alternatives, including preferred location of the activity.	The environmental attributes of the study site are included in section 5 of the report. The identification and assessment of Impacts are included in section 6 of the report. The summary of proposed mitigation measures is included in section 7 of the report. The outcome of the site selection matrix is attached in Annexure E7 and is summarised in section 2.3 of the report. The concluding statement is contained in section 6.14 of the report.
(i) A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including - A description of all environmental issues and risks that were identified during the basic assessment process; and An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	Please see Summary and Section 6 of the report and Appendix E for the specialist reports.
(j) An assessment of each identified potentially significant impact and risk, including - Cumulative impacts; The nature, significance and consequences of the impact and risk; The extent and duration of the impact and risk; The probability of the impact and risk occurring; The degree to which the impact and risk can be reversed; The degree to which the impact and risk may cause irreplaceable loss of resources; and The degree to which the impact and risk can be mitigated.	Please see Section F of the report and Appendix E for the specialist reports.
(k) Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.	Please see Section 6 of the report and Appendix E for the specialist reports.
(l) An environmental impact statement which contains – • A summary of the key findings of the environmental impact assessment;	Section 6.23 and 6.14 of this report.

Requirement	Details
• A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and • A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	See Appendix D Section 6.13 of this report.
(m) Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	See section 7 report.
(n) Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	See section 7 of this report.
(o) A description of assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	See 3.4 of this report.
(p) A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	See section 9 of this report.
(q) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	The proposed activity does include operational aspects.
(r) An undertaking under oath or affirmation by the EAP in relation to: The correctness of the information provided in the reports; The inclusion of comments and inputs rom stakeholders and I&APs; The inclusion of inputs and recommendations from the specialist reports where relevant; and Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	The declaration of the EAP is attached in Appendix G.
(s) Where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts.	This environmental assessment does not include application for decommissioning and closure of activities
(t) Any specific information that may be required by the competent authority.	Currently not applicable but will be included if such a request is made.
(u) Any other matters required in terms of section 24(4)(a) and (b) of the Act.	This section will be updated on receipt of the mandatory comment from the competent authority.

COMPETANT AUTHORITY COMMENT ON DRAFT BASIC ASSESSMENT REPORT

This section will be updated once the DFFE provide comment on the Draft Basic Assessment Report.

ORDER OF REPORT

Report Summary

Draft Basic Assessment Report – Main Report

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Appendix B	:	Biodiversity Overlays
Appendix C	:	Site Photographs
Appendix D	:	Solar Facility Layout Plans
Appendix E	:	Supplementary Reports (Specialist Reports and Technical Reports)
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Annexure E2	:	Avifaunal Impact Assessment (The Biodiversity Company, 2022)
Annexure E3	:	Agricultural Impact Assessment Report (Lanz, 2022)
Annexure E4	:	Heritage Impact Assessment Report (Lavin, 2022)
Annexure E5	:	Archaeology Impact Assessment Report (Lavin, 2022)
Annexure E6	:	Cultural Landscape Assessment (Lavin, 2022)
Annexure E7	:	Palaeontology Impact Assessment (Almond, 2022)
Annexure E8	:	Visual Impact Assessment (Stead, 2022)
Annexure E9	:	Social Impact Assessment (Barbour, 2022)
Annexure E10	:	Technical Design Report (Bulskop PV (Pty) Ltd, 2022)
Annexure E11	:	Water Consumption Study (Bulskop PV (Pty) Ltd, 2022)
Annexure E12	:	Site Selection Matrix (Bulskop PV (Pty) Ltd, 2022)
Annexure E13	:	Traffic and Transportation Assessment (JG Africa, 20212
Annexure E14	:	Stormwater Management Plan (SRK, 2022)
Annexure E15	:	Planning Statement (Townscape Planning Solutions, 2022)
Appendix F	:	Public Participation Process
Annexure F1	:	I&AP Register
Annexure F2	:	Comments and Response Report (to be included with final BAR)
Annexure F3	:	Adverts & Site Notices (To be included in the Final BAR)
Annexure F4	:	Draft BAR Notifications (To be included with final BAR)
Annexure F5	:	Draft BAR Comments and Responses (To be included with Final BAR)
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Annexure F7	:	Approval of Public Participation Plan

Appendix G	:	Other Information
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Annexure G6	:	Specialist CV's
Annexure G7	:	Correspondence with HWC (NID Submission / Acknowledgement / Comment)
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EXECUTIVE SUMMARY

I. INTRODUCTION

Cape EAPrac has been appointed by Bulskop PV (Pty) Ltd, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment process[4] required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the Bulskop PV facility on Portion 0 of Farm 423 near Beaufort West in the Western Cape Province of South Africa.

The total generation capacity of the solar facility will not exceed 120 MW_{AC} for input into the national Eskom grid. The project will feed into the National Grid via the existing Droërivier Major Transmission Substation (MTS). The grid connection to connect this project to the National Grid is being assessed as part of a separate environmental application process. This current BAR process only includes the IPP portion of the on-site substation.

The purpose of this **Draft Basic Assessment Report** (BAR) is to describe the environment to be affected, the proposed project, to present the site constraints identified by the various specialist during their site assessments and identify & assess the impacts of this development on the receiving environment. This information is herewith presented to all registered and potential Interested and Affected Parties (I&AP's), organs of state, state departments and the competent authority for review and comment. The public participation process has been undertaken in compliance with the approved public participation plan as attached in Annexure F6.

In compliance with Chapter 6 of the 2014 EIA regulations (as amended), Draft BAR is available for a 30 - Day period extending from **13 April 2022 – 19 May 2022.**

All comments received on the Draft BAR will be incorporated into the Final BAR that will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for consideration and decision making. After the department has taken a decision on the application, this decision will be communicated to all registered I&AP's along with details of the appeal process.

II. RECOMMENDATION OF THIS EIA

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 be considered for approval by the competent Authority, subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

Please refer to sections 6,7 and 9 of this Draft BAR for the justification of this recommendation.

III. NEED AND DESIRABILITY

Need and desirability for this project has been considered in detail in this environmental process. The overall need and desirability in terms of developing renewable energy generation in South Africa in the Western Cape Province and globally is considered in section 1, while the project specific need and desirability is considered in section 2.8 of this report.

IV. ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

[4] The environmental process follows a basic assessment process, as it is located within the Beaufort West Renewable Energy Development Zone.

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

The proposed development entails a number of listed activities, which require a Basic Assessment Process, which must be conducted by an independent Environmental Assessment Practitioner (EAP). Cape EAPrac has been appointed to undertake this process.

Table 1: NEMA 2014 (As amended) listed activities applicable to Bulskop PV.

Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended**	**Portion of the proposed project to which the applicable listed activity relates.**
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The Bulskop PV onsite substation will have a capacity of up to 132 kilovolts.
12	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The main access road for Bulskop PV crosses a watercourse. The footprint of this main access road within 32 m of the watercourse will exceed 100 square metres.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The main access road for Bulskop PV crosses a dry watercourse. The construction of this access road will require the movement of more than 10 cubic metres of soil from within this watercourse.
24	The development of a road— (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	The main access road for Bulskop PV will up to 10 metres in width.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The proposed Bulskop PV is considered commercial / industrial use with a total footprint of approximately 268 ha.
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— ((ii) where no reserve exists, where the existing road is wider than 8 metres;	The Main access road to Bulskop PV follows an existing farm access (which is wider than 10 m at the intersection with the R61). This existing farm access will be lengthened by more than 1 kilometre.
Activity No(s):	**Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	**Portion of the proposed project to which the applicable listed activity relates.**
1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,	The proposed Bulskop PV will have a generation capacity of up to 120 MWac.
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Bulskop PV will have a total footprint of approximately 268 ha.
Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Portion of the proposed project to which the applicable listed activity relates.**
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape ii. Areas outside urban areas;	The main access road for Bulskop PV will be up to 10 m wide outside of an urban area containing indigenous vegetation.

	(aa) Areas containing indigenous vegetation;	
12	The clearance of an area of 300 square metres or more of indigenous vegetation. i. Western Cape ii. Within critical biodiversity areas identified in bioregional plans;	Portions of the proposed Bulskop PV fall within a CBA 1 and CBA2 in terms of the Western Cape Biodiversity Spatial Plan. The clearance of more than 300 square metres will be required within these CBA's.
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. Western Cape ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation;	The existing farm access will widened and lengthened by more than 1 km outside of an urban area.

NOTE: Basic Assessment (BA) as well as Scoping and Environmental Impact Reporting (S&EIR) Activities are being triggered by the proposed development, but since the project is contained in a legislated REDZ, the EIA Process will follow a Basic Assessment process.

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

V. DEVELOPMENT PROPOSAL

Bulskop PV (Pty) Ltd, is proposing the construction of a photovoltaic (PV) solar energy facility (known as the Bulskop PV) located on the Remaining Extent (Portion 0) of Farm 423 approximately 12 km south-east of Beaufort West in the Western Cape Province. The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the Beaufort West Local Municipality within the Central Karoo District Municipality.

Five additional 120 MW PV facilities are concurrently being considered on the property and are assessed through separate Basic Assessment processes, namely:

- Hardeveld PV;
- Rosenia PV;
- Hoodia PV;
- Salsola PV; and
- Gamka PV.

A development footprint of approximately 268 ha is being assessed as part of this Basic Assessment Report (BAR) and the infrastructure associated with the 120 MW facility includes:

- PV modules and mounting structures;
- Inverters and transformers;
- Cabling;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 8 m wide);
- Auxiliary buildings (33 kV switch room, gatehouse and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Perimeter fencing and security infrastructure;
- Rainwater tanks;
- Temporary and permanent laydown areas;
- Facility substation.
- Own-build grid connection solution, including on site substation

The Bulskop PV facility intends to connect to the National Grid via the Droërivier Main Transmission Substation (MTS) (approximately 17.5 km west of the facility), however, the grid connection infrastructure associated with this grid solution is being assessed as part of a separate Environmental Application.

VI. PROFFESIONAL INPUT

The following professionals[5] have provided input into this environmental process:

1.	Terrestrial Ecology	-	The Biodiversity Company
2.	Avifaunal	-	The Biodiversity Company
3.	Heritage	-	CTS Heritage
4.	Archaeology	-	CTS Heritage
5.	Cultural Landscape Assessment	-	CTS Heritage
6.	Palaeontology	-	Natura Viva
7.	Agricultural Potential	-	Mr Johann Lanz
8.	Visual	-	Visual Resource Management Africa
9.	Aquatic Biodiversity	-	The Biodiversity Company
10.	Social	-	Tony Barbour
11.	Engineering aspects	-	Bulskop PV (Pty) Ltd
12.	Stormwater	-	SRK Consulting
13.	Traffic and Transportation	-	JG Afrika
14.	Water Consumption	-	Bulskop PV (Pty) Ltd
15.	Planning	-	Townscape Planning Solutions

VII. PLANNING CONTEXT

The land use planning process will involve the following:

- Application for consent use in terms of the Spatial Planning and Land Use Management Act, Act 16 of 2013, submitted to the Beaufort West Local Municipality, in terms of the Beaufort West Municipal Standard Zoning Scheme By-law, 2020.

In terms of the Beaufort West Municipal Standard Zoning Scheme By-law, 2020 a renewable energy structure is permitted as a consent use of Agricultural 1 Zoned land.

VIII. ASSESSMENT OF IMPACTS

This section simply lists the potential key potential impacts that were identified and assessed by the various specialists (more details on the significance and ratings of these impacts are provided in section 6.4 – 6.11 below and in the specialist reports attached in Appendix E).

Terrestrial Biodiversity Impacts Assessed

<u>Construction Phase Terrestrial Biodiversity Impacts</u>

- Destruction, fragmentation and degradation of habitats and ecosystems;
- Spread and/or establishment of alien and/or invasive species;

[5] Note that not all of these professionals are considered specialists as contemplated in chapter 3 of Regulation 326. Studies such as Engineering, Stormwater, Traffic, water consumption and planning constitute "technical" studies, rather than specialist studies and as such, the requirements in appendix 6 of R326 do not apply to all these professionals

- Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration);
- Mortalities and displacements of fauna and flora SCCs; and
- Chemical pollution associated with dust suppressants for roads and laydown areas

Operational Phase Terrestrial Biodiversity Impacts

- Continued fragmentation and degradation of habitats, ecosystems and CBA1 and 2 areas;
- Spread of alien and/or invasive species;
- Displacement, direct mortalities and reduced dispersal/migration of faunal community (including SCC) due to disturbance (road collisions, collisions with solar panels and substation/powerlines, noise, light, dust, vibration); and
- Chemical pollution associated with measures to keep PV clean

Decommissioning Phase Terrestrial Biodiversity Impacts

- Continued fragmentation and degradation of habitats and ecosystems; and
- Spread of alien and/or invasive species.

Agricultural Impacts Assessed[6]

- Loss of agricultural potential by occupation of land
- Loss of agricultural potential by soil degradation
- Dust impact.
- Enhanced agricultural potential through increased financial security for farming operations (positive impact)

Avifaunal Impacts Assessed

Pre-construction Phase Avifaunal Impacts

- Temporary disturbance of avifauna due to increased human presence and possible use of machinery and/or vehicles.

Construction Phase Avifaunal Impacts

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, dust, vibrations);
- Collection of eggs and poaching;
- Roadkill by the construction vehicles (some birds gets blinded by lights or has a freeze response to disturbance ;
- Chemical pollution associated with dust suppressants; and
- Displacement or death of SCCs.

Operational Phase Avifaunal Impacts

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, light, dust, vibrations);
- Collection of eggs and poaching;
- Roadkill;
- Collisions with PV panels and associated infrastructure;
- Electrocution by infrastructure and connections to PV;
- Chemical pollution associated with measures to keep PV clean;
- Fencing of PV site, especially a risk for larger birds; and

[6] The agricultural impacts identified apply equally to all phases of the development.

- Displacement or death of SCCs.

Decommissioning Phase

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, dust, vibrations);
- Roadkill;
- Collisions with PV and associated infrastructure; and
- Fencing of PV site, especially a risk for larger birds.

Aquatic Biodiversity Impacts Assessed

Construction Phase Aquatic Biodiversity Impacts

- Increased runoff and sediment input into the water courses
- Smothering and subsequent loss of instream habitat due to sediment inputs
- Flow path modification
- Input of toxicants
- Alteration to flow patterns and velocities
- Erosion of exposed surfaces
- Physical changes (e.g., turbidity)
- Chemical changes (e.g., pH, salinity toxicants and heavy metals)
- Indiscriminate dumping of rubble and construction material
- Improper re-establishment of flow paths
- Increased sedimentation
- Increased erosion from exposed surfaces

Operational Phase Aquatic Biodiversity Impacts

- Flow alteration/concentrations during heavy precipitation events
- Flow concentration leading to increased erosion and scouring downstream systems
- Increased runoff and flow velocities entering the watercourse
- Increased flow concentration
- Increased erosion and scouring of bed and banks, especially in discharge areas
- Increased sedimentation and turbidity
- Watercourse and water quality impairment
- Increased exposed and hardened surfaces
- Degradation of watercourse flora and fauna through the spread of alien and invasive species
- Increased litter and refuse within the channel
- Input of toxicants
- Nutrient loading

Decommissioning Phase Aquatic Biodiversity Impacts

The decommissioning impacts are deemed to be similar to those outlined for the construction phase.

Heritage Impacts Assessed[7]

- Impacts on Cultural Landscape
- Impacts on Archaeology Resources
- Impact on Palaeontology Resources

[7] Impact on heritage resources will occur in the construction phase and that impact will remain.

Visual Impacts Assessed

Construction Phase Visual Impacts:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

Operational Phase Visual Impacts

- Massing effect in the landscape from a large-scale modification.
- On-going soil erosion.
- On-going windblown dust.

Decommissioning phase Visual Impacts

- Movement of vehicles and associated dust.
- Wind-blown dust from the disturbance of cover vegetation / gravel.

Cumulative visual Impacts

- A long-term change in land use setting a precedent for other similar types of solar energy projects.

Traffic Impacts Assessed

Construction phase Traffic Impacts

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching for electrical cables and other ancillary construction works that will temporarily generate the most traffic.

Operational phase Traffic Impacts

The traffic generated during the operational phase will be minimal and will not have an impact on the surrounding road network.

Cumulative Traffic Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

IX. IMPACT SUMMARY

The table below summarises the significance (with mitigation) of all impacts assessed in the sections above[8].

For ease of easy references, impacts are visually reflected using the following colour scheme[9].

All positive impacts (regardless of their significance)	
Neutral or Negligible negative impacts	
Very Low and Low negative impacts	

[8] In order to attain these outcomes, the mitigation measures reflected in section 7 of the report need to be implemented.

[9] Where specialist ratings fall across 2 of the groups, the worst case is reflected in the quick reference.

Medium and Medium – High negative impacts

High and Very High negative impacts

Table 2: Summary of the significance of impacts associated with Bulskop PV[10].

Impact	Significance / Status
Construction Phase Terrestrial Biodiversity Impacts	
Destruction, fragmentation and degradation of habitats, and ecosystems	Moderate Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Displacement of faunal community (Including possible SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration);	Low Negative
Mortalities and displacements of fauna and flora SCCs.	Low Negative
Operational Phase Terrestrial Biodiversity Impacts	
Continued fragmentation and degradation of habitats and ecosystems	Moderate Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)	Low Negative
Reduced dispersal of fauna	Low Negative
Chemical pollution	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts	
Continued fragmentation and degradation of habitats and ecosystems	Low Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Agricultural Impacts – all phases.	
Loss of agricultural potential by occupation of land	Low Negative
Loss of agricultural potential by soil degradation	Low Negative
Dust impact	Low Negative
Enhanced agricultural potential through increased financial security for farming operations (positive impact)	Low Positive
Heritage Impacts All Phases	
Impacts on Cultural Landscape	Low Negative
Impacts on Archaeology Resources	None
Impact on Palaeontology Resources	Low Negative
Visual Impacts	
Visual Impacts during the Construction Phase	Low Negative
Visual Impacts during the operational Phase	Medium – High Negative
Visual Impacts during the closure and decommissioning phase	Low Negative
Construction Phase Aquatic Risks	
Clearing associated with construction of roads and laydown yards	Low Negative
Final landscaping and post-construction rehabilitation	Low Negative
Stormwater Management Infrastructure	Low Negative
Erosion and sedimentation control measures	Low Negative
Pollution Control	Low Negative
Staff ablutions	Low Negative
Operation of machinery & equipment	Low Negative
Temporary infrastructure	Low Negative
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Low Negative
Increased traffic and human disturbance (maintenance)	Low Negative
Alien invasive plants	Low Negative
Decommissioning of the solar facility.	Low Negative
Operational Phase Aquatic Risks	
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Low Negative
Increased traffic and human disturbance (maintenance)	Low Negative
Alien invasive plants	Low Negative
Decommissioning Phase Aquatic Risks	

[10] This includes cumulative impacts associated with the facility

Impact	Significance / Status
Decommissioning of the solar facility	Low Negative
Construction Phase Social Impacts	
Creation of employment and business opportunities	Medium Positive
Presence of construction workers and potential impacts on family structures and social networks	Low Negative
Influx of job seekers	Low Negative
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Low Negative
Increased risk of veld fires	Low Negative
Impact of construction activities and vehicles	Low Negative
Loss of farmland	Low Negative
Operational Phase Social Impacts	
Promotion of renewable energy projects	High Positive
Creation of employment and business opportunities	Medium Positive
Establishment of Community Trust	High Positive
Generate income for affected landowner/s	Medium Positive
Visual impact and impact on sense of place	Low Negative
Impact on tourism	Low Negative
Cumulative Social Impacts	
Cumulative impact on sense of place	Low Negative
Cumulative impact on services	Low Negative
Cumulative impact on local economies	High Positive
Decommissioning Phase Social Impacts	
Social impact on the local economy associated with decommissioning	Low Negative
Pre-Construction Phase Avifaunal Impacts.	
Temporary disturbance of avifauna due to increased human presence and possible use of machinery and/or vehicles.	Absent
Construction Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade CBA1 and CBA2 habitat, ultimately displacing avifauna)	Moderate
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Collection of eggs and poaching	Low
Roadkill	Low
Chemical pollution associated with dust suppressants	Low
Displacement or death of SCCs.	Moderate
Operational Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)	Moderate
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Collection of eggs and poaching	Low
Roadkill	Low
Collison's with PV and associated infrastructure	Moderate
Electrocution by infrastructure and connections to PV	Moderate
Electrocution by infrastructure and connections to PV	Low
Chemical pollution associated with measures to keep PV clean	Low
Fencing of PV site	Low
Displacement or death of SCCs.	Moderate
Decommissioning Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)	Low
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Roadkil	Absent
Collisons with PV and associated infrastructure	Absent
Fencing of PV site.	Absent
Construction Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust	Low
Noise pollution due to increased traffic	Low
Operational Phase Traffic Impacts.	

Impact	Significance / Status
The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.	Absent
Decomissioning Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust.	Low
Noise pollution due to increased traffic.	Low

X. IMPACT STATEMENT

The majority of impacts range from **high positive** to **medium negative** with the exception of a single **medium – high** impact associated with the operational phase visual impacts relating to the large scale transformation of the landscape. As this medium – high impact associated with landscape change is accommodated wholly within the Renewable Energy Development Zone, it is deemed to be acceptable.

All high, very high and critical negative impacts have been avoided by the avoidance of sensitive features or have been mitigated to acceptable levels

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 1) avoids the main sensitive features, (most notably watercourses , Ridges, and visually sensitive areas) with the exception of a water course crossing associated with the access road.

The affected area is considered suitable for development and there are no impacts associated with Bulskop PV that cannot be mitigated to an acceptable level. With the enhancement measures suggested by the Social Specialist, high positive impacts on Creation of employment and business opportunities, Establishment of Community Trust, Generation income for affected landowner and Cumulative impact on local economies can be expected.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the layout provided for the assessment, Bulskop PV can be supported from a terrestrial biodiversity, Aquatic biodiversity, avifaunal, visual, social, heritage (inclusive of Archaeology, Cultural Landscape and Palaeontology), agricultural and traffic point of view.

A map showing the proposed activity in relation to the key sensitive features is in attached in **Appendix D**. All sensitive features along with their appropriate buffers are shown in this plan. As required by the EMPr, all areas outside of the proposed development footprint are to be demarcated as no go areas.

Please refer to the table in the section above listing the key impacts and their significance post mitigation for the preferred alternative. This section must be read in conjunction with the suggested mitigation measures listed in section 7 of this Report.

XI. CONCLUSIONS & RECOMMENDATIONS

This environmental process is currently being undertaken to present proposals to the public and potential I&APs and to identify and assess environmental impacts, issues and concerns raised as a result of the proposed development.

Cape EAPrac is of the opinion that the information contained in this Basic Assessment Report and the documentation attached hereto is sufficient to allow the I&APs to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

This environmental process has not identified any fatal flaws with the proposal and as such it is our reasoned view that the project should be considered for authorisation, subject to the outcome of the public participation process and on condition that all the mitigation measures outlined in section 7 of the report are adopted and implemented. All specialists concur that the development as proposed (Layout Alternative 1) can be considered for approval subject to the implementation of all mitigation measures. All impacts range from high positive to

medium - high negative and all high, very high and critical negative impacts have been avoided by the risk adverse approach or mitigated to acceptable levels.

All stakeholders are requested to review the Draft BAR and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 30-day comment period. All comments received during this comment period will be considered, responded and included in the Final BAR that will be submitted to DFFE for decision making.

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 be considered for approval by the competent Authority, subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

DRAFT BASIC ASSESSENT REPORT

1 INTRODUCTION

Cape EAPrac has been appointed by Bulskop PV (Pty) Ltd, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate the Basic Assessment process[11] required in terms of the National Environmental Management Act (NEMA, Act 107 of 1998) for the proposed development of the Bulskop PV facility on Portion 0 of Farm 423 near Beaufort West in the Western Cape Province of South Africa.

The total generation capacity of the solar facility will not exceed 120 MW_{AC} for input into the national Eskom grid. The project will feed into the National Grid via the existing Droërivier Major Transmission Substation (MTS). The grid connection to connect this project to the National Grid is being assessed as part of a separate environmental application process. This current BAR process only includes the IPP portion of the on-site substation.

The purpose of this **Draft Basic Assessment Report** (BAR) is to describe the environment to be affected, the proposed project, to present the site constraints identified by the various specialist during their site assessments and identify & assess the impacts of this development on the receiving environment. This information is herewith presented to all registered and potential Interested and Affected Parties (I&AP's), organs of state, state departments and the competent authority for review and comment. The public participation process has been undertaken in compliance with the approved public participation plan as attached in Annexure F6.

In compliance with Chapter 6 of the 2014 EIA regulations (as amended), Draft BAR is available for a 30 - Day period extending from **13 April 2022 – 19 May 2022.**

All comments received on the Draft BAR will be incorporated into the Final BAR that will be submitted to the Department of Forestry, Fisheries and the Environment (DFFE) for consideration and decision making. After the department has taken a decision on the application, this decision will be communicated to all registered I&AP's along with details of the appeal process.

1.1 RECOMMENDATION OF THIS EIA

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 be considered for approval by the competent Authority, subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to. Please refer to sections 6,7 and 9 of this Draft BAR for the justification of this recommendation.

1.2 OVERVIEW OF ALTERNATIVE ENERGY IN SOUTH AFRICA AND THE WESTERN CAPE[12]

The section below provides an overview of the potential benefits associated with the renewable energy sector in South Africa. Given that South Africa supports the development of renewable energy at national level, the intention is not to provide a critical review of renewable energy. The focus is therefore on the contribution of renewable energy, specifically in terms of supporting economic development.

[11] The environmental process follows a basic assessment process, as it is located within the Beaufort West Renewable Energy Development Zone.

[12] This section has been prepared with input from the social specialist.

The Renewable Energy Independent Power Producers Procurement Programmes (REIPPPP)[13] primary mandate is to secure electrical energy from the private from renewable energy sources.

The programme is designed to reduce the country's reliance on fossil fuels, stimulate an indigenous renewable energy industry and contribute to socio-economic development and environmentally sustainable growth. The REIPPPP has been designed not only to procure energy but has also been structured to contribute to the broader national development objectives of job creation, social upliftment and broadening of economic ownership.

By the end of June 2020, the REIPPPP had made the following significant impacts in terms of energy supply:

- 6 422 MW of electricity had been procured from 112 Renewable Energy Independent Power Producers (IPPs) in seven bid rounds.
- 4 276 MW of electricity generation capacity from 68 IPP projects has been connected to the national grid.
- 49 461 GWh of energy has been generated by renewable energy sources procured under the REIPPPP since the first project became operational in November 2013.

Renewable energy IPPs have proved to be very reliable. Of the 68 projects that have reached COD, 64 projects have been operational for longer than a year. The energy generated over the past 12-month period for these 64 projects is 11 079 GWh, which is 93% of their annual energy contribution projections (P50) of 11 882 GWh over a 12-month delivery period. Twenty-eight (24) of the 64 projects (38%) have individually exceeded their P50 projections.

In line with international experience, the price of renewable energy is increasingly cost competitive when compared with conventional power sources. The REIPPPP has effectively captured this global downward trend with prices decreasing in every bid window. Energy procured by the REIPPPP is progressively more cost effective and has approached a point where the wholesale pricing for new coal- and renewable-generated energy intersect.

The document notes that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has attracted significant investment in the development of the REIPPs into the country. The total investment (total project costs[14]), including interest during construction, of projects under construction and projects in the process of closure is R209.7 billion (this includes total debt and equity of R209.2 billion, as well as early revenue and VAT facility of R0.5 billion).

To date, the REIPPPP has attracted R41.8 billion in foreign investment and financing in the seven bid windows.

The REIPPPP also contributes to Broad Based Black Economic Empowerment and the creation of black industrialists. In this regard, Black South Africans own, on average, 33% of projects that have reached financial close (BW1-BW4), which is 3% higher than the 30% target. This includes black people in local communities that have ownership in the IPP projects that operate in or near their communities and represents the majority share of total South African Entity Participation.

On average, black local communities own 9% of projects that have reached financial close. This is well above the 5% target. In addition, an average of 21% shareholding by black people in engineering, procurement, and construction (EPC) contractors has been attained for projects that have reached financial closure. This is higher than 20% target. The shareholding by black people in operating

[13] It is proposed that the Bulskop PV will form part of the REIPPPP

[14] Total project costs means the total capital expenditure to be incurred up to the commercial operations date in the design, construction, development, installation, and or commissioning of the project)

companies of IPPs has averaged 24% (against the targeted 20%) for the 68 projects in operation (i.e. in BW1–4).

To date, a total of 52 603 job years[15] have been created for South African citizens, of which 42 355 job years were in construction and 10 248 in operations. These job years should rise further past the planned target as more projects enter the construction phase. Employment opportunities across all five active bid windows are 126% of the planned number during the construction phase (i.e. 33 707 job years), with 23 projects still in construction and employing people. The number of employment opportunities is therefore likely to continue to grow beyond the original expectations. By the end of June 2020, 68 projects had successfully completed construction and moved into operation. These projects created 33 449 job years of employment, compared to the anticipated 23 619. This was 42% more than planned.

The emission reductions for the programme during the preceding 12 months (June 2019-June 2020) is calculated as 11.5 million tonnes CO2 (MtonCO2) based on the 1 1313 GWh energy that has been generated and supplied to the grid over this period. This represents 56% of the total projected annual emission reductions (20.5MtonCO2) achieved with only partial operations. A total of 50.2 Mton CO2 equivalent reduction has been realised from programme inception to date.

The Green Jobs Study notes that South Africa has one of the most carbon-intensive economies in the world, therefore making the greening of the electricity mix a national imperative. Within this context the study notes that the green economy could be an extremely important trigger and lever for enhancing a country's growth potential and redirecting its development trajectory in the 21st century.

The REIPPPP introduced in 2011, has by all accounts been highly successful in quickly and efficiently delivering clean energy to the grid. Increasingly competitive bidding rounds have led to substantial price reductions.

A 20-year sovereign guarantee on the power purchase agreement (PPA) and, especially, ideal solar power conditions, have driven the investment case for Renewable Energy in South Africa. In this regard South Africa has been identified as one of the worlds' leading clean energy investment destinations

[15] The equivalent of a full-time employment opportunity for one person for one year

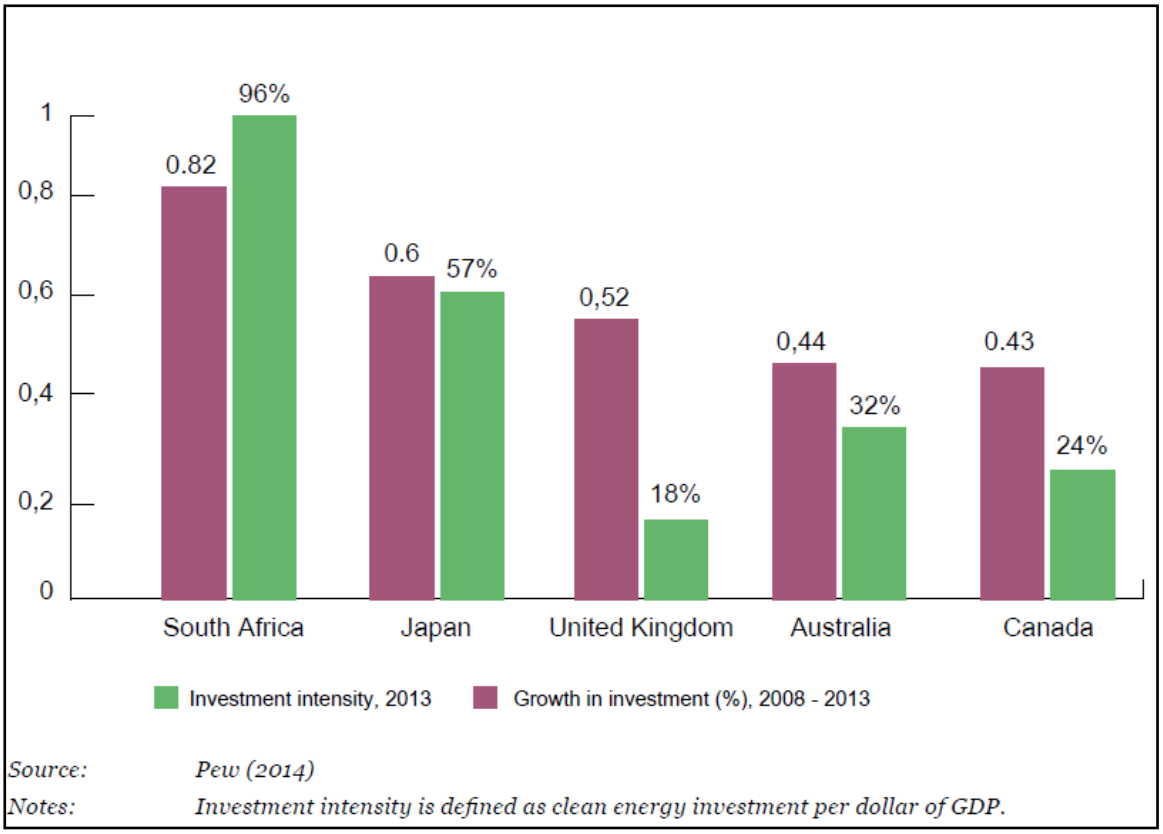


Figure 1: South Africa as a global lead clean energy investment destination

With regard to local economic development, the REIPPPP sets out various local economic development requirements with stipulated minimum threshold and aspirational targeted levels, which each bidder must comply with. Based on the Broad-Based Black Economic Empowerment Codes, this requirement comprises the following components which make up a scorecard:

- Ownership by black people and local communities,
- Job creation,
- Local content,
- Management control,
- Preferential procurement,
- Enterprise development, and
- Socio-economic development.

1.3 ASSUMPTIONS & LIMITATIONS

This section provides a brief overview of *specific assumptions and limitations* having an impact on this environmental application process:

- It is assumed that the information on which this report is based (specialist studies and project information, as well as existing information) is **correct, factual and truthful.**
- The proposed development is **in line** with the statutory planning vision for the area, most notably the local Spatial Development Plan as well as the Beaufort West REDZ, and thus it is assumed that issues such as the cumulative impact of development in terms of character of the area and its resources, have been taken into account during the strategic planning for the area.

- It is assumed that all the relevant **mitigation and management measures** and agreements specified in this report will be implemented in order to ensure minimal negative impacts and maximum environmental benefits.
- It is assumed that due consideration will be given to the **discrepancies in the digital mapping** (PV panel array layouts against possible constraints), caused by differing software programs, and that it is understood that the ultimate/final positioning of solar array will only be confirmed on-site with the relevant specialist/s.
- The Department of Water and Sanitation / Brede Gouritz Catchment Management Agency **will consider the submission of a water use application** necessary for allowing the use of water from any water resource on site. The assumption at this stage is made that water provision for construction and operations is to be obtained from the local municipality.
- It is assumed that Stakeholders and Interested and Affected Parties notified of the availability of this will submit all relevant **comments within the designated 30-days** review and comment period, so that these can included in the Final BAR to be timeously submitted to the competent authority, the Department of Forestry, Fisheries and the Environment, for consideration and decision making.

The assumptions and limitations of the various specialist studies are included in their respective reports attached in Appendix E.

2. PROPOSED ACTIVITY

Bulskop PV (Pty) Ltd is proposing the establishment of a commercial photovoltaic (PV) solar energy facility (SEF), called Bulskop PV, located on the Remaining Extent of Farm 423 south-east of Beaufort West in the Western Cape Province. Bulskop PV will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 120 MW. The project is situated within the Beaufort West Local Municipality within the Central Karoo District Municipality.

Bulskop PV will include solar PV technology (monofacial or bifacial) with either fixed, single or double axis tracking mounting structures, as well as associated infrastructure, which includes:

- Laydown area;
- Access and Internal Road network;
- Auxiliary buildings (33 kV switch room, gatehouse and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Facility substation transformers and internal electrical reticulation;
- Inverters and cabling;
- Battery Energy Storage System (BESS);
- Rainwater tanks; and
- Perimeter fencing and security infrastructure.

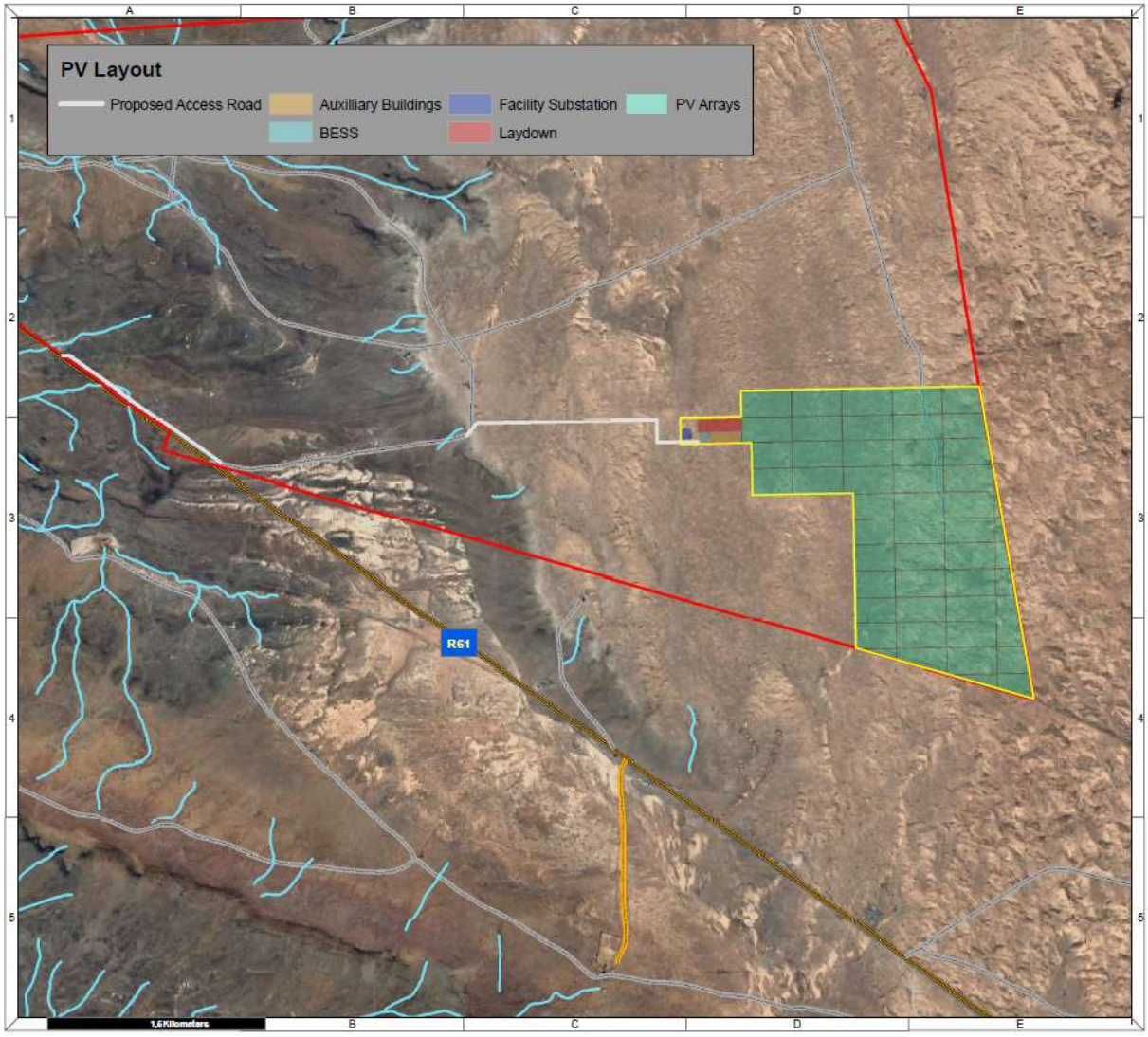


Figure 2: Proposed layout of Bulskop PV, showing key project components (Please also refer to the full-scale plans attached in Appendix A).

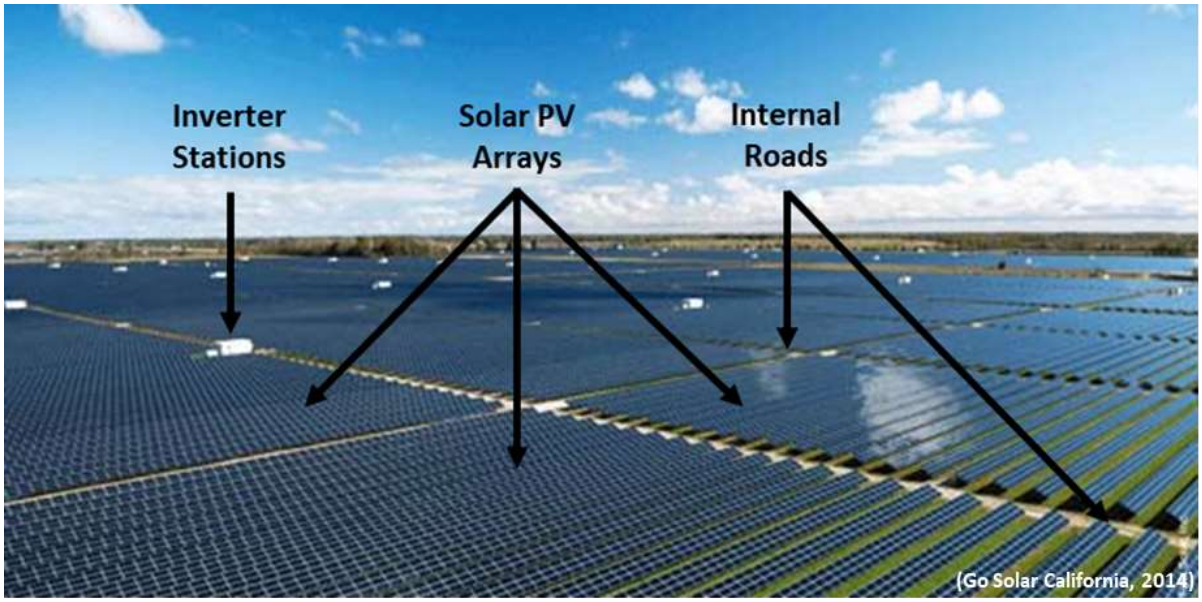


Figure 3: Typical configuration of a Solar PV Energy Facility (Bulskop PV (Pty) Ltd)

Bulskop PV will have a net generating capacity of 120 MW with an estimated maximum footprint of ± 268 ha. The approximate area that each component of Bulskop PV will occupy is summarised in the table below.

Table 3: Component Areas and % of Total Project Area

SEF Component	Estimated Area	% of Total Area (± 268 ha)	% of Study Area (2667.04 ha)
PV array	± 246 ha	91.82 %	9.2 %
Permanent and construction laydown areas	Up to 4 ha	1.1.49 %	0.14 %
Auxiliary buildings	± 1 ha	0.38 %	0.04 %
Internal roads	± 8 ha	2.90 %	0.30 %
Substation	± 1 ha	0.38 %	0.04 %
Main Road	Approx. 4 ha	1.49 %	0.14%
BESS	Up to 4 ha	1.49%	0.14 %

Please refer to the Technical Design report attached in Appendix E10 for an overview of the infrastructure that is proposed to form part of the Bulskop PV Project.

2.1 SOLAR ARRAY

Solar PV modules are connected in series to form a string. A number of strings are then wired in parallel to form an array of modules. PV modules are mounted on structures that are either fixed, north-facing at a defined angle, or mounted to a single or double axis tracker to optimise electricity yield.

2.2 MOUNTING STRUCTURES

Various options exist for mounting structure foundations, which include cast/ pre-cast concrete, driven/ rammed piles, or ground/ earth screws mounting systems. Typical examples of these are shown in the images below (Images: Bulskop PV (Pty) Ltd).

Figure 4: Cast Concrete Foundation (Bulskop PV (Pty) Ltd, 2022).

Figure 5: Driven/ Rammed Steel Pile (Bulskop PV (Pty) Ltd, 2022)

Figure 6: Ground Screw (Bulskop PV (Pty) Ltd, 2022)

The impact on agricultural resources and production of these options are considered to be the same, however concrete is least preferred due the effort required at a decommissioning phase in order to remove the concrete from the soil, and therefore its impact on the environment. Bulskop PV will therefore aim to make the most use of predrilling and backfilling of holes prior to either driven/ rammed piles, or ground/ earth screws mounting systems, and only in certain instances resort to concrete foundations should geotechnical studies necessitate this.

The images below show typical examples of the preferred mounting technology during and after installations (Photos: Cape EAPrac).

Figure 7: Pre-drilling of holes prior to the ramming of steel piles.

Note that the vegetation is not completely removed prior to the drilling and installation of the piles.

Figure 8: pre-drilled holes are backfilled with a wet sand mixture and steel piles placed in position ready for ramming.

The predrilled holes are backfilled on a continuous basis to ensure that no fauna is trapped in the holes

Figure 9: Ramming of steel piles into the pre-drilled / backfilled holes.

Note that the ramming machines follow the same entry and exit routes as the drilling rigs in order to reduce the impacts of trampling and compaction.

Figure 10: Completed ramming and assembly showing vegetation remaining intact beneath the modules.

Figure 11: Showing vegetation re-establishing along the driplines of the arrays within weeks after installation.

2.3 AUXILIARY BUILDINGS

The auxiliary buildings will comprise of the following as a minimum:

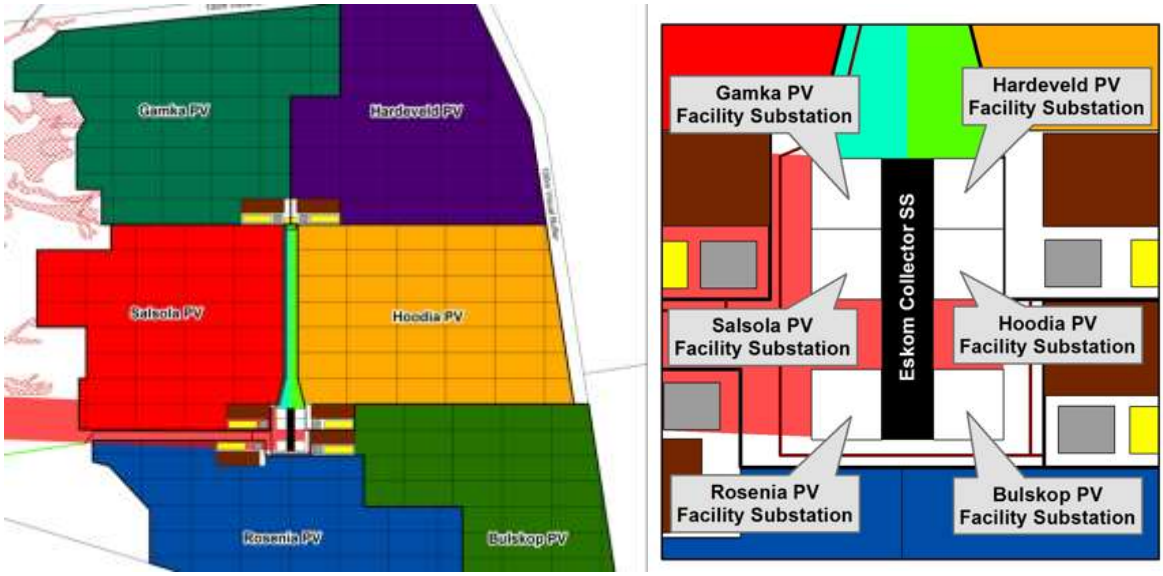
- 33 kV switch room;
- Control building/ centre;
- Offices;
- Warehouses;
- Canteen & visitors centre;
- Staff lockers & ablution; and
- Gatehouse and security.

The total area occupied by auxiliary buildings is approximately 1 ha, excluding the facility switching station/ substation.

2.4 GRID CONNECTION AND CABLING

Bulskop PV intends to connect to the Droërivier MTS (400/132 kV) located ± 17.5 km to the west of Bulskop PV, via the 132 kV Bulskop collector substation/ switching station located between Salsola PV, Hoodia PV, Bulskop PV and Rosenia PV facilities. The proposed Bulskop PV substation will be up to 1 ha (PV facility component) and feature a step-up transformer/s to transmit electricity via a 132 kV OHL between the Bulskop collector substation/ switching station and onto the Droërivier MTS.

A diagrammatic representation showing how the Bulskop PV on site substation is situated directly adjacent to the Bulskop collector substation / switching station.



A grid connection corridor of approximately 300 m wide and 17.5 km long is being assessed (as part of a separate environmental process) to allow for the optimisation of the grid connection and associated infrastructure. The grid connection infrastructure will be developed within the 300 m wide grid connection corridor, which will allow for the avoidance of identified environmental sensitivities. The grid corridor will connect the 6 PV projects to the Droërivier MTS, via the Bulskop collector substation/ switching station[16].

[16] It must be noted that this environmental process only includes the Bulskop PV on site substation. The Bulskop collector substation/ switching station and the up to 132 kV overhead powerline to the Droërivier MTS are being assessed as part of a separate environmental process.

2.5 BATTERY ENERGY STORAGE SYSTEM

Renewable energy can currently achieve lower costs than fossil fuels. By incorporating energy storage systems (BESS) into renewable energy facilities, electricity can be stored during generation peaks and supplied during demand peaks.

Lower costs coupled with improved efficiencies, high energy density, lightweight design and low environmental risks, make non-liquid/ solid-state (e.g., Lithium battery technologies) the preferred technology alternative.

The proposed Bulskop PV BESS will have a maximum footprint of approximately 4 ha and will be situated adjacent to the on-site substation, laydown area and auxiliary buildings as indicated in the layout plan above and as attached in Appendix D.

Figure 12: Typical Example of a Battery Energy Storage System.

2.6 ACCESS ROUTES AND INTERNAL ROADS.

The proposed project site is accessible via the provincial R61 road which runs parallel to the site on the western boundary.

The preferred site access point will be the western access off the R61 as depicted in the figure below. Access Road 1 (red route in the figure below) will be a maximum of 10 m in width and will be a gravel surface[17]. This route is considered to be the most technically and environmentally preferred access road as it largely follows the existing farm access roads and only crosses relatively minor shallow drainage lines. The existing access point 2 in the image below was originally proposed as the preferred access point, however the engineers conducting the Traffic Impact Study advised against utilizing this access point due to potential line of site concerns resulting in safety issues on the R61. Please refer to the traffic assessment compiled by JG Africa and attached in Annexure E13.

[17] The possible future surfacing of this access road is not excluded from this environmental process.

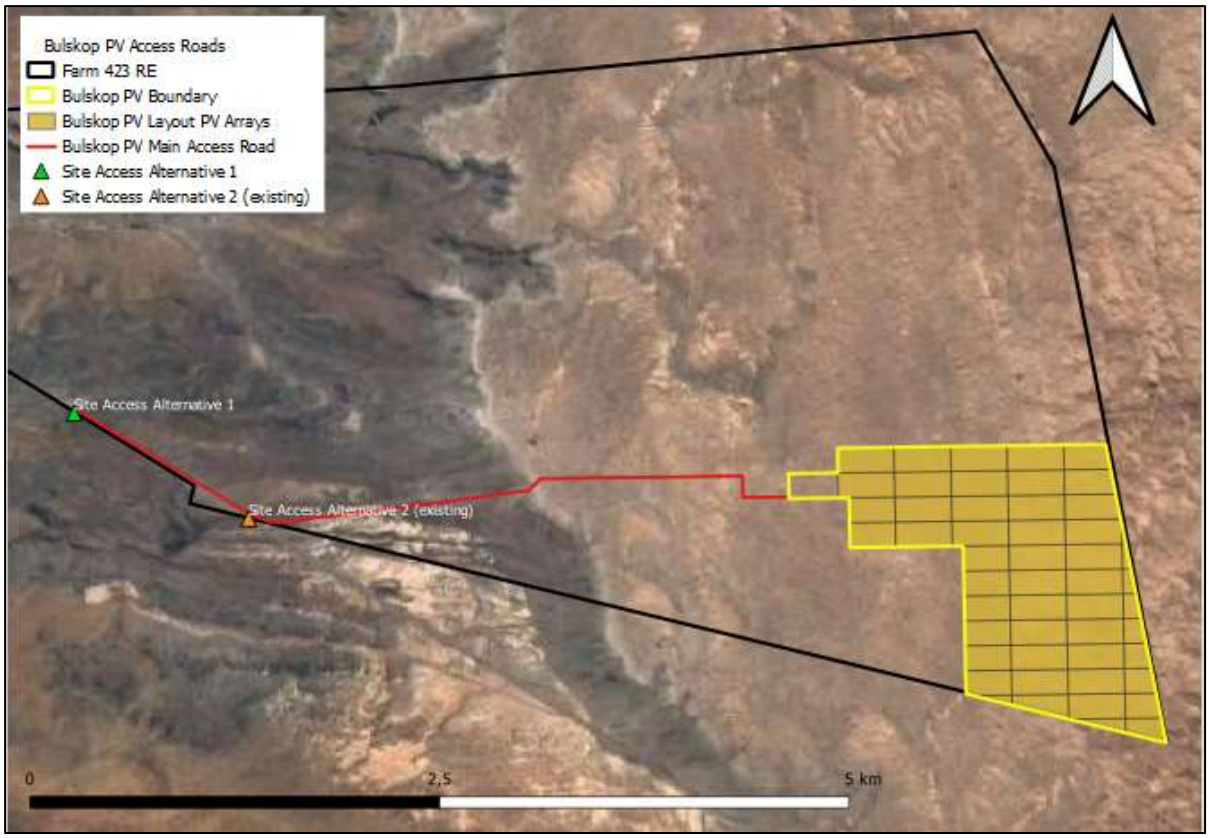


Figure 13: Access route and proposed access point to Bulskop PV. Site Access 1 is the preferred access as identified in the Traffic Impact Assessment (Appendix E13)

As can be seen in the image excerpt below, a large portion of the proposed access (grey dashed line) follows the existing farm access road.

Figure 14: New (white) and existing (grey-dashed) roads that will provide access to Bulskop PV.

Figure 15: Existing farm access point along the R61. The proposed new access point is situated approximately 2.3 kilometres to the Northwest of the existing entrance.

The internal road network of Bulskop PV will be gravelled roads, up to 8 m in width, around the solar array periphery as well as be east to west running gravel roads between the blocks used for maintenance and cleaning of solar PV panels.

A detailed transport and traffic study has been compiled and is attached Appendix E13. Precautionary measures will be taken to mitigate the risk of ground disturbances where access roads will be constructed. Special attention will be given to drainage, water flow and erosion by applying appropriate building methods.

2.7 TRANSPORT OF COMPONENTS AND STAFF

A Traffic Impact and Transportation Study is attached in Appendix E13. This section focuses on the transportation requirements during the construction phase, as the operational transportation requirements are minimal with very little impact.

It is anticipated that the following vehicles will access the site during construction:

- Conventional trucks within the freight limitations to transport building material to the site;
- 40 ft container trucks transporting solar panels, frames and the inverter, which are within freight limitations;
- Flatbed trucks transporting the solar panels and frames, which are within the freight limitations;
- Light Differential Vehicle (LDV) type vehicles transporting workers from surrounding areas to site;
- Drilling machines and other required construction machinery being transported by conventional trucks or via self-drive to site; and
- The transformers will be transported as abnormal loads.

There are two viable options for the port of entry for imported components - the Port of Ngqura in the Eastern Cape and the Port of Saldanha in the Western Cape. A third option, the Port of Cape Town, could be considered for smaller components.

The Port of Ngqura is located approximately 395 km travel distance from the proposed site whilst the Port of Saldanha is located approximately 555 km travel distance from the proposed site. The Port of Ngqura is the preferred port of entry, however, the Port of Saldanha can be used as an alternative should the Port of Ngqura not be available.

The preferred route from the Port of Ngqura is shown in green in the image below.

Figure 16: Proposed routes for the transport of imported components (JG Arfika, 2022)

It is anticipated that elements manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg and Pinetown/Durban areas. It is also assumed that the transformer, which will be transported with an abnormal load vehicle, will be transported from the Johannesburg area and therefore it needs to be verified that the route from the manufacturer to the site does not have any load limitations for abnormal vehicles. At this stage, only a high-level assessment can be undertaken as no information of the exact location of the manufacturer is known and all road structures (such as bridges and culverts) need to be confirmed for their load bearing by the South African National Roads Agency (SANRAL) or the respective Roads Authority.

It is envisaged that most materials, water, plant, services and people will be procured within a 120 km radius from the proposed site; however, this would be informed by the REIPPPP requirements.

2.8 SERVICES REQUIRED

The services required for the construction and operation of the proposed Bulskop PV are outlined in Appendix E10 and summarised below. Please also refer to Annexure G8 for copies of the requests to Beaufort West Municipality for confirmation of availability of services.

2.8.1 Solid Waste

Solid waste during the construction phase will mainly be in the form of construction material, excavated substrate and domestic solid waste. All waste generated during construction will be separated into recyclable components and removed from site by a licenced recycling service provider. All non-recyclable waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by the contractor. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility. The applicant has submitted a letter of request to the technical services department within the Beaufort West Local Municipality requesting consent to

make use of the local solid waste landfill site. Excess excavation material will either be spoiled offsite at a registered facility or used for landscaping berms[18] within the overall PV footprint.

2.8.2 Sewerage.

During the construction phase, chemical ablution facilities will be utilised. These ablution facilities will be maintained, serviced and emptied by an appointed contractor, who will dispose of the effluent at a licensed facility off site. The applicant has submitted a letter of request to the technical services department within the Beaufort West Local Municipality requesting consent to make use of the local waste water treatment plant.

Once construction is complete, the chemical ablution facilities will be removed from the site. A conservancy tank which will be regularly emptied by a registered service provider will be installed at the Operations & Maintenance building and on-site/ facility substation and the BESS control room.

2.8.3 Hazardous substances

During the construction phase, use of the following hazardous substances is anticipated:

- Cement associated with piling activities and construction of buildings and inverter station plinths;
- Petrol/ diesel for construction plant; and
- Limited amounts of lubricants and transformer oils.

Temporary storage and disposal of hazardous waste will be done in compliance with relevant legislation (i.e., stored in covered containers with appropriate bunding). Refuelling areas to be in designated positions, with suitable mitigation to reduce the risk of hydrocarbon spills. In Terms of the EMPr, Spill kits will be available on site to clean up any minor spillages.

[18] If any landscaped berms are constructed around infrastructure, these must be done in such a way as to comply with the overall Stormwater design philosophy of maintaining sheet flow.

Figure 17: Hydrocarbon Spill Kits must be in place within the site camp and in the field within 500 m of any drilling or ramming activity.

2.8.4 Water Supply

Water required during the construction and operation phases will be sourced from (in order of priority):

1. The Local Municipality (LM) - The applicant has submitted a letter of request to the technical services department within the Beaufort West Local Municipality requesting confirmation of water availability to supply the construction and operational phase of the Bulskop PV. Should the Beaufort West Local Municipality have sufficient volumes/ the water will most likely be trucked in, or otherwise made available for collection at their Water Treatment Plant via a metered standpipe. Specific arrangements will be agreed upon with the Beaufort West Local Municipality (should they have sufficient capacity for tor the project) in a Service Level Agreement, which will only be concluded if the project receives preferred bidder status in terms of the REIPPPP.
2. Investigation into a third-party water supplier which may include a private services company.
3. The investigation of drilling a borehole on site, which includes complete geohydrological testing, groundwater census and a Water Use License Application (WULA) in terms of section 21a of the National Water Act, 1998.

2.9 PROJECT NEED AND DESIRABILITY

In keeping with the requirements of an integrated Environmental Impact process, the DEA&DP *Guidelines on Need and Desirability (2010 & 2011)* were referenced to provide the following estimation of the activity in relation to the broader societal needs. The concept of need and desirability can be explained in terms of its two components, where *need* refers to *time,* and *desirability* refers to *place*. Questions pertaining to these components are answered in the Sections below.

The section above (overview to alternative energy in South Africa and the Western Cape) considers the overall need for alternative, so-called 'green energy' in light of the known environmental burdens associated with the impact of coal power generation through which most of our country's electricity is currently being generated. Associated aspects such as air pollution, water use and carbon tax are discussed in order to further explain the need and desirability for 'green energy' projects in general.

This section however considers the need and desirability of this specific project at this point in time.

2.9.1 Feasibility consideration

The commercial feasibility for the proposed 120 MW_{AC} Bulskop PV to be built on private land near Beaufort West, has been informed by its contextual location, and economic, social and environmental impacts and influence (with due consideration to the project falling within a REDZ). The project has gathered sufficient information and conducted studies of the site and the region to make qualified and reliable assumptions on the project's various impacts.

2.9.2 Solar Resource & Energy Production

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. Beaufort West falls within the greater Karoo District which receives some of the highest Global Horizontal Irradiation (GHI) outside of the Northern Cape, South Africa. The GHI for the Beaufort West region varies between 2,050 and 2,080 kWh/m^2/annum. More specifically, the GHI for the Bulskop PV Cluster is in the region of approximately 2,070 kWh/m^2/annum. The irradiation level is an important factor in a highly competitive bidding environment under REIPPPP; the economic viability of a project is a critical success factor.

Figure 18: Global Horizontal Irradiation of Bulskop PV Cluster (Bulskop PV (Pty) Ltd, 2022) (Solar GIS.2022)

2.9.3 Access to Grid

The Droerivier Main Transmission Substation (MTS) is located approximately 17 km east of the Bulskop PV Cluster[19]. According to the Eskom Grid Connection Capacity Assessment (GCCA) published in March 2022 the statistic for the Droerivier MTS consists of the following:

- Transformer Voltage: 400/132kV
- Transformers installed: 1 x 250 MVA 400/132 kV and 1 x 125 MVA 400/132 kV
- Upgrade status: The latest Eskom Transmission Development Plan (TDP) 2022 – 2031 identifies Droerivier as one of the substations that will see the deployment of additional 400/132 kV transformation to integrate renewable generation in the Western Cape.
- REIPPPP Generation allocation to date: 73 MW
- Transformer Limit: 311.25 MW (without additional transformer)
- Substation Limit: 1,460 MW
- Local Area and Supply Area Limit: 1,820 MW

Ease of access into the Eskom electricity grid is vital to the viability of a solar PV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission.

In addition, Eskom's '2040 Transmission Network Study' has drawn on various scenarios to determine the grid's development requirements, as well as to identify critical power corridors for future strategic development, of which the Central corridor[20] is one of these.

[19] The Bulskop grid connection and associated infrastructure will be assessed as part of a separate environmental process

[20] Bulskop PV and the associated grid connection falls within this

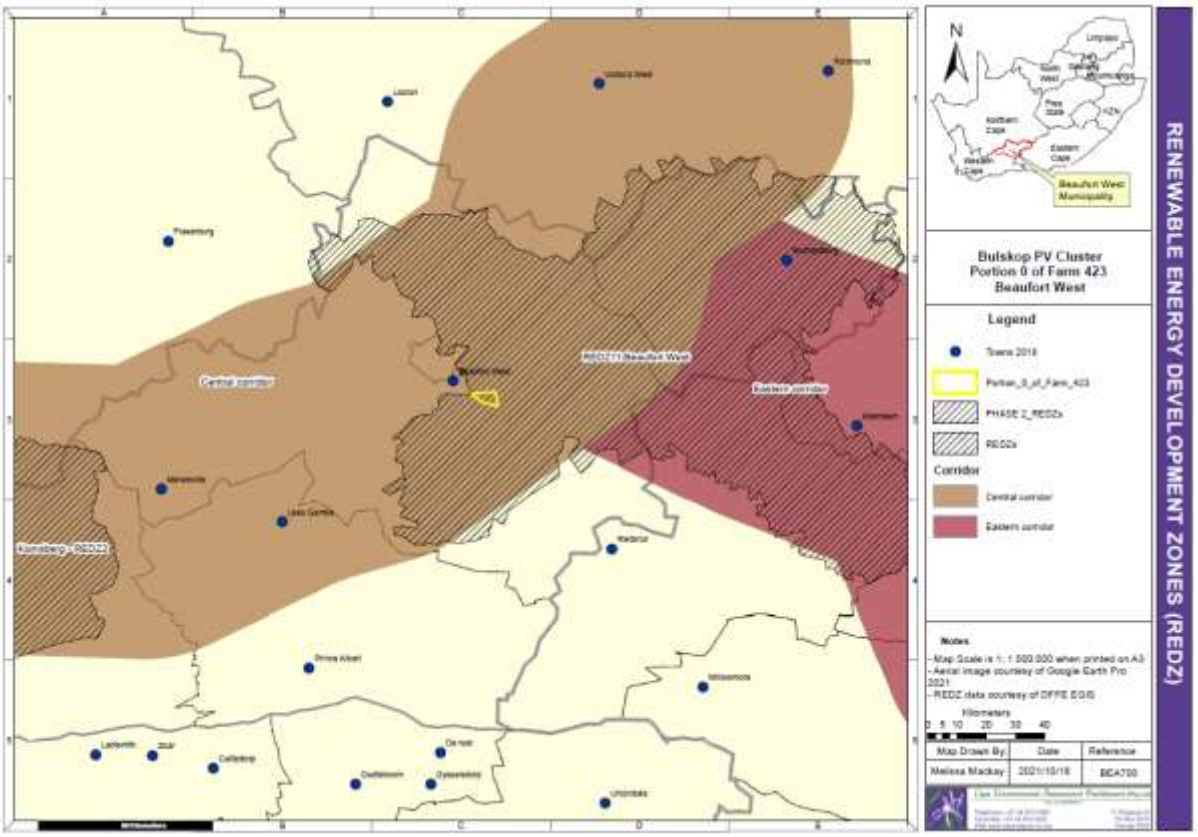


Figure 19: Plan showing the study site within the REDZ and Strategic Electrical Grid Corridor.

2.9.4 Site Suitability

Among the outstanding characteristics of the Bulskop PV site is its exceptionally flat nature, sufficient medium sensitivity environments (the proposed layout plan was able to avoid all areas with a high sensitivity and very high sensitivity) and accessible location, facilitating the delivery of bulky PV panel infrastructure, and the construction and assembly process. The proximity of the site to the R61 decreases the impact on secondary roads from the traffic going to and from Bulskop PV during construction and operations.

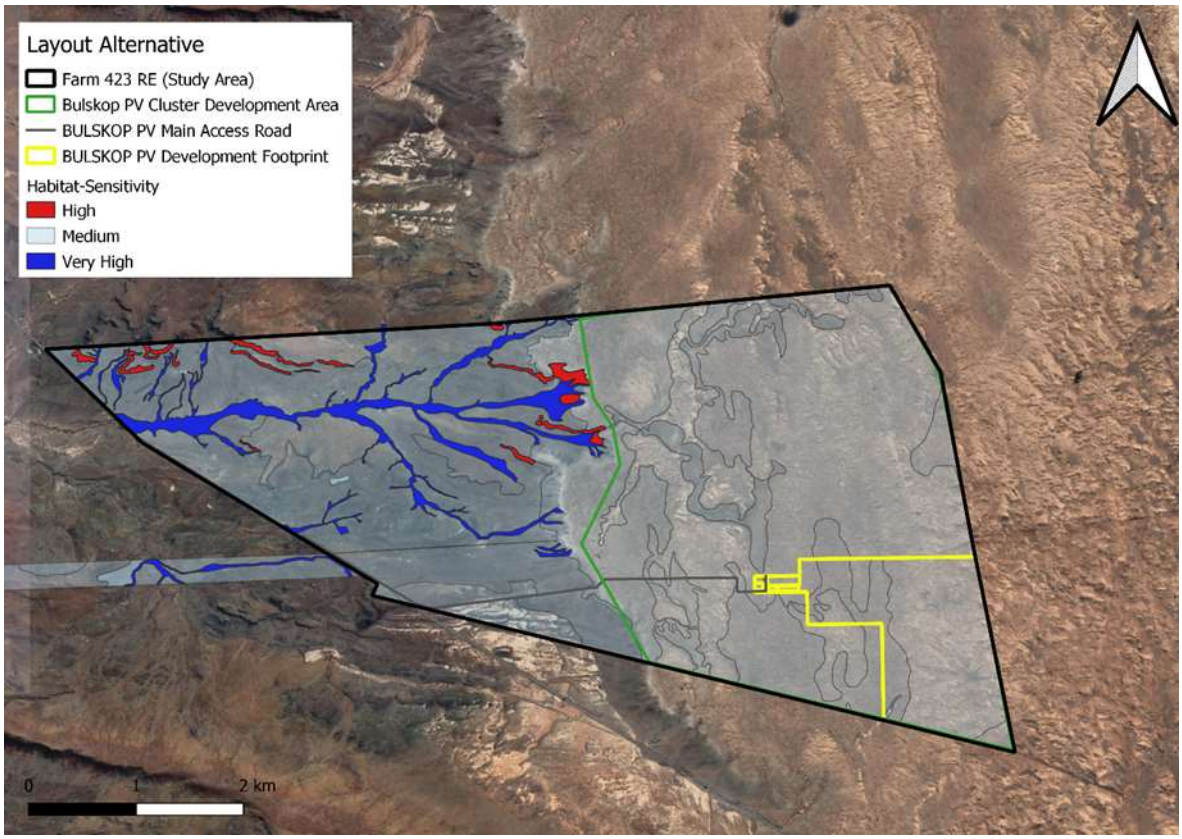


Figure 20: Showing the position of Bulskop PV entirely within the medium sensitivity habitats.

The relatively close proximity of the existing Eskom Droerivier MTS also allows for connection via a relatively short distribution line. As the site is not used for intensive agricultural purposes, Bulskop PV will therefore not significantly interfere with the agricultural productivity of the area.

2.9.5 Social and Economic impact

Please refer to the Social Impact Assessment Report in Annexure E9 for a detailed description of the social environment. The social impact assessment concluded that the potential social impacts associated with the proposed Bulskop PV range from high positive, to low negative.

The establishment of a Community Trust will also benefit the local community. The significance of this impact is rated as High Positive. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. The findings of the Social Impact also indicate that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives.

2.9.6 Employment & Skills Transfer

The benefits of renewable energy facilities to local regions are not confined to the initial investment in the project. They also provide a reliable and on-going income for landowners and municipality, creating direct employment opportunities for locals, as well as flow-on employment for local businesses through provision of products and services to the project and its employees.

Bulskop PV will have a positive impact on local employment. During the estimated 18-month construction phase, the project will employ approximately 350 individuals of various qualifications. The majority will be provided by the local labour market.

During operations, Bulskop PV is expected to have up to 60 employment opportunities ranging from security staff to administration and artisans. Due to the fact that there is limited local skilled labour in the field of renewable energy, the employment structure will likely consist of local and outside capacity. To guarantee successful operations over the lifetime of the investment, Bulskop PV will likely use the skills of outside labour to cross-train local specialists. This cross training and skills development will take place especially in the area of technical maintenance and administration.

2.9.7 Need (time)

In accordance with the guidelines on need and desirability, a project should be able to answer a series of questions to demonstrate need. These are highlighted in the table below:

Table 4: Project Need Analysis

Need	Discussion	
Is the land use considered within the timeframe intended by the existing approved Spatial Development Framework (SDF)? (I.e., is the proposed development in line with the projects and programmes identified as priorities within the credible IDP?	Yes	The spatial vision for the municipality set out in the 2013 Spatial Development Framework is "Wilderness tourism and transport gateway to the people, mountains and plains of the Central Karoo". The SDF notes that the implications of this vision are that the main rural economic resource outside of eco-tourism is extensive agriculture. In terms of economic function, the SDF notes that Beaufort West the most important settlement in the municipality and also plays a sub-regional role serving other small towns beyond its boundaries, particularly to the west, e.g., Victoria West, Fraserburg, and Loxton. It is also a major refuelling and service stop on the N1 highway for trucks and is an important station on the national rail route between Cape Town and Gauteng. Section 5.2.1 of the SDF lists four bioregions that can be distinguished in terms of the natural environment and economy. Figure 2.4 illustrates the location of the bioregions within the Beaufort West Municipality. Table 2.1 in the SDF lists the characteristics of each region, including renewable energy potential. The bio- regions are: • Nuweveld Highlands. • Gamka River Basin. • Sout River Badlands. • Sneeuwberg Foothills. The project is located in the Sout River Badlands. As indicated in Table 3.1 of the SDF, the Sout River bioregion has "fairly good solar and wind" potential. The carrying capacity of the area is low, and the landscape is described as "flat, desert like cosmic plain inkling to the south". Section 5.2.1 of the SDF, Natural Systems Synthesis, notes that the Annual Horizontal Solar Radiation is fairly high – 2000 – 2100 KWh/m2, increasing towards the north. Similarly, wind speeds of 6 – 8m/s are also fairly high. The section notes that both these sources could be potential energy generators. Considering the above, it can be concluded that the area is suitable for PV development in terms of the SDF.
Should the development occur here at this point in time?	Yes	

Need	Discussion	
		The proposed Bulskop PV energy facility is to be located outside the Beaufort West urban edge, but within a legislated REDZ, and would promote diversification to the local economy as well as serve as a catalyst for further expansion in the stream of sustainable renewable energy development within this REDZ. As outlined in the section above, the Droerivier substation has existing excess capacity in order to accommodate the development right away (thus reducing the opportunity costs).
Does the community / area need the activity and the associated land use concerned?	Yes	The Beaufort West Local Municipality identified the opportunity for a renewable energy project through their SDF and IDP processes, which include public participation. The proposed Bulskop PV development will allow for a diversification of employment, skills and contribute to the potential development of small business associated with its construction, operation and maintenance activities. The proposed Bulskop PV development will contribute electricity to the constrained Western Cape and National electrical network, contributing to a provincial and national need. Bulskop PV has been designed in such a way so as to avoid or minimise potential negative impacts of the local environment while enhancing potential positive impacts, locally and regionally.
Are the necessary services with adequate capacity currently available?	partially	Bulskop PV requires the installation of an overhead power line to connect to the existing Eskom Droerivier Substation via the Bulskop collector substation[21] (feed into the national grid system), as well as part of the access road to the development site from the R61 (following existing farm tracks for most part). The cost of supplying the new infrastructure will be covered by the Applicant, and the impacts thereof have been assessed in this environmental process. The water required for the construction and operation of Bulskop PV will be sourced from the Beaufort West Municipality (preferred option) and will be supplemented by stored rainwater. The applicant may at a later stage consider the utilisation of groundwater to supplement this supply, this will however be subject to approval in terms of the National Water Act. Construction waste (general waste) will be disposed of at the existing landfill sites. Defunct and damaged modules identified during construction will be returned to the supplier for recycling and/or disposal.
Is this development provided for in the infrastructure planning of the municipality?	Yes	Yes. Attracting private investment and the employment opportunities associated with renewable energy development are identified as priority strategies to create sustainable urban and rural settlements.
Is this project part of a national programme to address an issue of national concern or importance?	Yes	In order to meet the increasing power demand within South Africa, Eskom has set a target of 30% of all new power generation to be derived from independent power producers (IPPs). The Applicant is one such IPP which

[21] To be assessed as part of a separate environmental process.

Need	Discussion	
		intends to generate up to 120MW of electricity from the proposed Bulskop PV, for input into the national grid (via the Bulskop collector substation to the existing Droerivier Substation). The proposed Bulskop PV is also situated within a legislated REDZ.

2.9.8 Desirability (place)

In accordance with the guidelines on need and desirability, a project should be able to answer a series of questions to demonstrate desirability. These are highlighted in the table below:

Table 5: Project Desirability Analysis

Desirability	Discussion	
Is the development the best practicable environmental option for this land / site?	Yes	The target property is outside the Beaufort West Urban Edge, within a legislated REDZ. The property has a poor agricultural potential due to the arid climate and other limiting factors. These factors have rendered the property vacant with limited land use option alternatives. Considering these factors, it is very unlikely to be considered for an alternative land use such as urban development. The property is furthermore not within an area earmarked for the expansion of protected areas, nor does it contain any unique biodiversity features. The area is thus unlikely to be considered for conservation use.
Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?	No	The vision for the Beaufort West Local Municipality as set out in the IDP (2017-2022) is "Beaufort West, economic gateway in the central Karoo, where people are developed and live-in harmony together". The mission is "to reflect the will of the South African people as reflected in the Constitution and by Parliament. The IDP lists the five Key Performance Areas, namely: • Basic Service Delivery and Infrastructure Development (KPA 1). • Local Economic Development (KPA2). • Institutional Development and Municipal Transformation (KPA 3). • Financial Viability and Management (KPA 4). • Good Governance and Public Participation (KPA 5). KPA 1 (Basic Service Delivery and Infrastructure Development) and KPA 2 (Local Economic Development) are relevant to the proposed project. However, the IDP notes that the municipality does not have a Local Economic Development Strategy and Implementation Plan in place. The key challenges facing the Beaufort West Local Municipality include: • Electricity capacity constraints • Poor maintenance of existing public facilities • High rate of the unemployment and low household income levels. • Identification and implementation of more labour-intensive catalytic projects • Sustainable Economic Growth (Speed up economic growth and transform the economy to create decent work and sustainable livelihoods, Strategy for economic growth and inclusion) The IDP notes that the key objectives associated with KPA 2 include facilitating investment and maintenance of economic and social infrastructure to ensure infrastructure-led economic growth and development. Linked to this is the creation of an investment friendly environment to attract investment to

Desirability	Discussion	
		enable growth and job creation. The proposed development has the ability to create employment and attract investment to the area. The strategies identified to address the challenges facing the municipality include: • Facilitate development and growth of SMME's. • Facilitate Education and Skills Development for Cooperatives & SMME's. • To provide SMME Support and Capacity building. The establishment of the proposed PV project can assist to support these strategies. The IDP furthermore highlights the risks posed by climate change, noting that the risk is relatively high in Beaufort West Local Municipality as it is an arid area that has always been prone to drought situations. The sectors that are vulnerable to climate change include agriculture and tourism. In terms of renewable energy, the 2017-2022 IDP notes that innovative solutions can contribute towards growth and development of the municipality, including the introduction of solar energy. The IDP also identifies major infrastructure projects that can be implemented to develop and promote economic development in the area, including large wind and solar energy projects subject to appropriate guidelines and siting principles. A number of community meetings were held as part of the review of the 2017-2022 IDP. The key issues identified in Ward 2 where the proposed project is located included: • Housing project for Nelspoort, paving of roads, renovation of hall and sport fields. • Upgrade of water supply infrastructure. • Upgrading/fencing and provision of toilet and water at cemetery. • Establishment of a service centre for pensioners. • Upgrading of the stadium. • Cleaning of river. • Provision of school transport for children. Some of these issues can inform the identification of Socio-Economic Development allocations during the operational phase.
Would the approval of this application compromise the integrity of the existing approved environmental management priorities for the area?	unlikely	According to the national vegetation map (Mucina & Rutherford 2018, the solar development site lies entirely within a vegetation type that is classified as Least Threatened, (ecosystems that cover most of their original extent and which are mostly undamaged, healthy and functioning). Portions of the site are situated in a CBA 1 and CBA2 area. The Ecology Specialist (Appendix E1) has confirmed that the area designated as a CBA1 and 2 is in a modified state, with medium functional integrity. Considering the extent of this relatively intact ecosystem type, and the fact that the site is not highly sensitive (there are no unique, threatened or otherwise unique habitats present which are not widely available in the wider landscape), it can withstand some loss of natural area through development.
Do location factors favour this land use at this place?	Yes	The region has been identified as being one of the most viable areas for solar energy generation outside of the Northern Cape due to the following factors: • Excellent solar radiation (compared to other regions); • Close to existing main transport routes and access points;

Desirability	Discussion	
		• Close to connection points to the local and national electrical grid; and • Outside of very high and high sensitivity areas. The proposed site is furthermore situated within a legislated REDZ and as such has been subjected to a detailed Strategic Environmental Assessment in which highly sensitive landscapes were already excluded from these areas. The ecological sensitive areas on and surrounding the solar site have informed the optimal location and layout for the proposed solar project, with minimal impact to the receiving environment, subject to implementation of mitigation measures.
How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas?	Yes	The alternatives considered for the solar development have been iteratively designed and informed by various investigations and assessments that considered both the natural and cultural landscapes. The natural and culturally sensitive areas have been identified and where possible, avoided to prevent negative impacts on such areas.
How will the development impact on people's health and wellbeing?	Yes	The site is located outside of the Beaufort West Urban Edge and as a result is unlikely to impact negatively on the community's health and wellbeing. The closest populated settlement is situated more than 8km from the site.
Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	Unlikely	The next best land use alternative to the solar facility is limited agriculture (the status-quo). However, the proposed development site does not have any significant agricultural value and has not been utilised for any intensive agricultural purposes. The carrying capacity of the site is too low to generate noteworthy financial benefit from agricultural activities. The development of the proposed solar facility would constitute the loss of approximately 268ha of the overall property. The economic benefits and opportunities that the proposed solar development holds for the landowner and the local economy of the municipal area cannot be recovered from the current or potential agricultural activities. The opportunity costs in terms of the water-use requirements of Bulskop PV are within acceptable bounds if one considers the minimal demand on the resources.
Will the proposed land use result in unacceptable cumulative impacts?	Unlikely.	The sites are within the legislated REDZ have been identified as an area with high potential for renewable energy generation: The potential for further, future solar developments in the area cannot be discounted (as many have already been approved or are in progress). However, these will have synergistic benefits for the economy and growth of the area, while the contribution to cumulative habitat loss in the area associated with this and potential future solar development would be relatively small in relation to the land resources available, with low impacts restricted to the local area.

2.10 SITE SELECTION PROCESS

The site selection process followed a two-stage approach; firstly, to select the property for the proposed development (Remaining Extent of Farm 423 (Portion 0)) and secondly, to select the footprint of the proposed development within the farm portion. A site selection matrix supplied by the applicant is attached in Annexure E12.

2.10.1 Property Selection

The following criteria were taken into account by the applicant when selecting the property for the proposed development of the Bulskop PV.

2.10.1.1 Proximity to towns with a need for socio-economic upliftment

The proposed Bulskop PV facility is situated approximately 12 km southeast of Beaufort West in the Western Cape Province. The Beaufort West region is economically constrained due to its arid climate, challenging agricultural conditions, lack of water and limited natural resources. As a result, the unemployment rate is high. Power generation projects are one of the rare growth opportunities for Beaufort West since it is strategically positioned relative to the National Transmission Network.

To this extent Bulskop PV is situated in close proximity to the Beaufort West town. Consequently, local labour would be easy to source, which fits in well with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) economic development criteria for socio-economic upliftment.

2.10.1.2 Access to grid

Power transmission considerations: The Droerivier Main Transmission Substation (MTS) is located approximately 17 km east of the property as illustrated in the topographical plan below.

The Bulskop grid connection and associated infrastructure will be assessed as part of a separate environmental process.

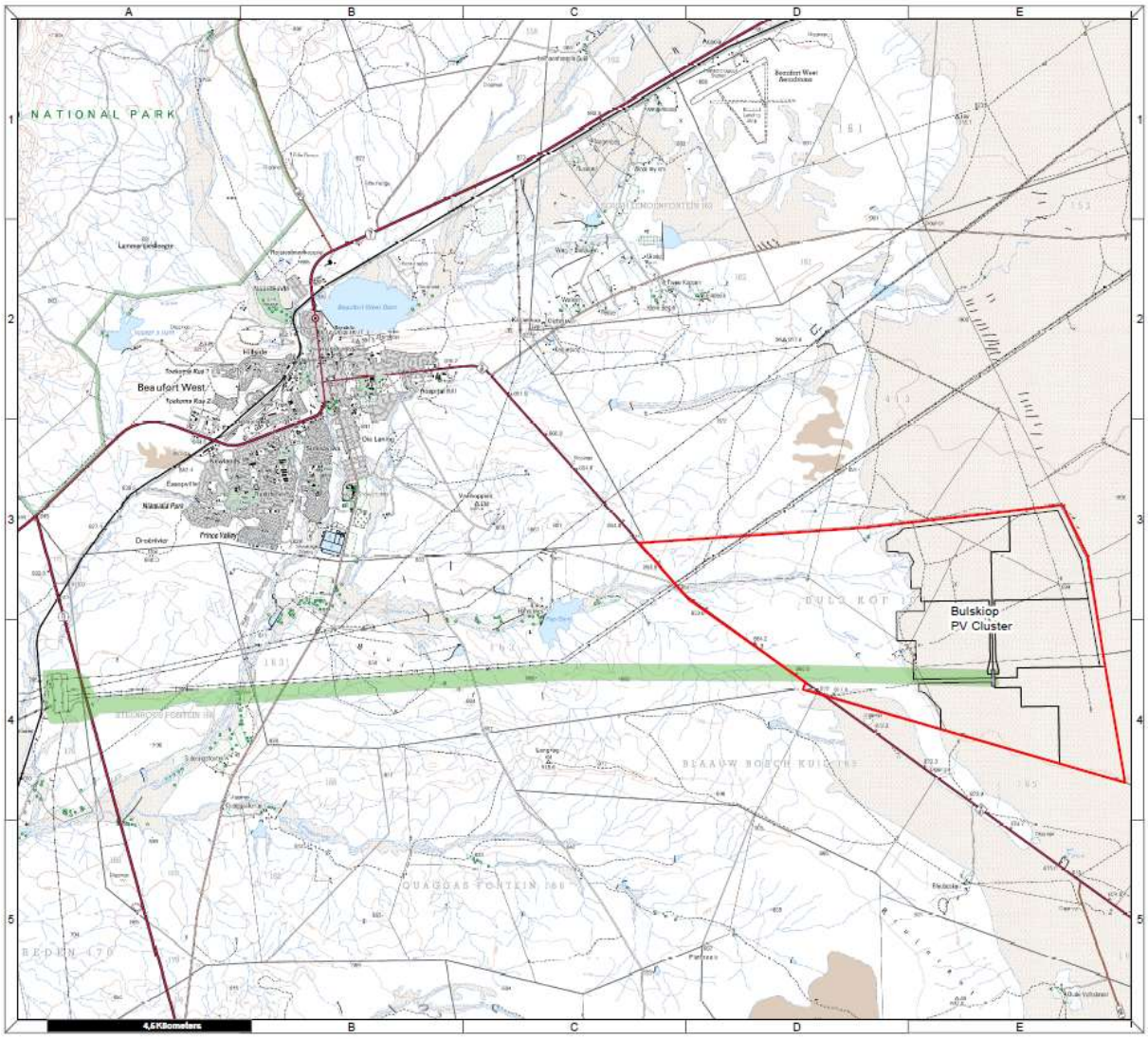


Figure 21: Proximity of RE Farm 423 to the Droerivier substation

Ease of access into the Eskom electricity grid is vital to the viability of a solar PV facility. Projects which are in close proximity to a connection point and/or demand centre are favourable, and reduce the losses associated with power transmission. In addition, Eskom's '2040 Transmission Network Study' has drawn on various scenarios to determine the grid's development requirements, as well as to identify critical power corridors for future strategic development, of which the Central corridor is one of these.

The national power corridors consisting of five transmission power corridors of 100 km in width have been gazetted by the Department of Environmental Affairs (DEA) following the outcome of the strategic environmental assessment (SEA) which aimed to identify environmentally acceptable routes over which long-term environmental impact assessment (EIA) approvals can be secured. Bulskop PV falls into the Central corridor

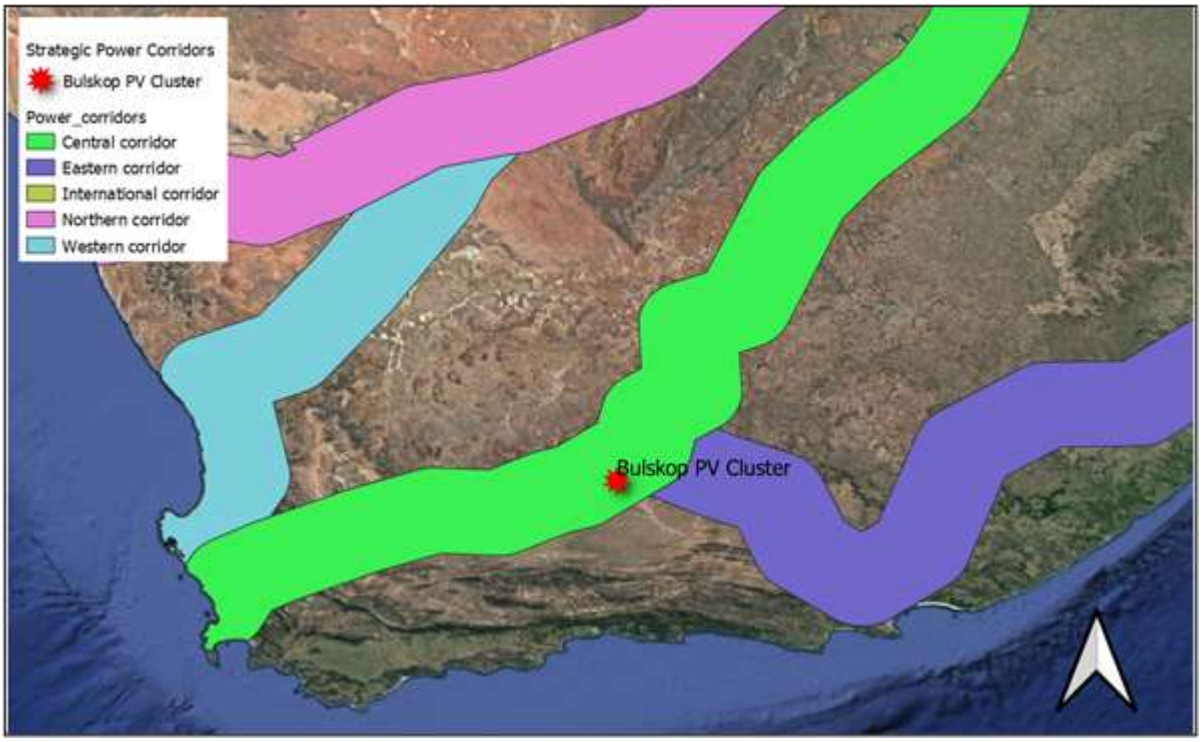


Figure 22: Eskom "Critical Power" Corridors. The Bulskop PV Cluster is located within the Central corridor as shown by the red star

2.10.1.3 Renewable Energy Development Zones (REDZ)

The Remaining Extent of Farm 423 falls entirely within the Beaufort West REDZ and has thus been highlighted at a National Strategic Level as being suitable for the Development of Large-Scale PV facilities.

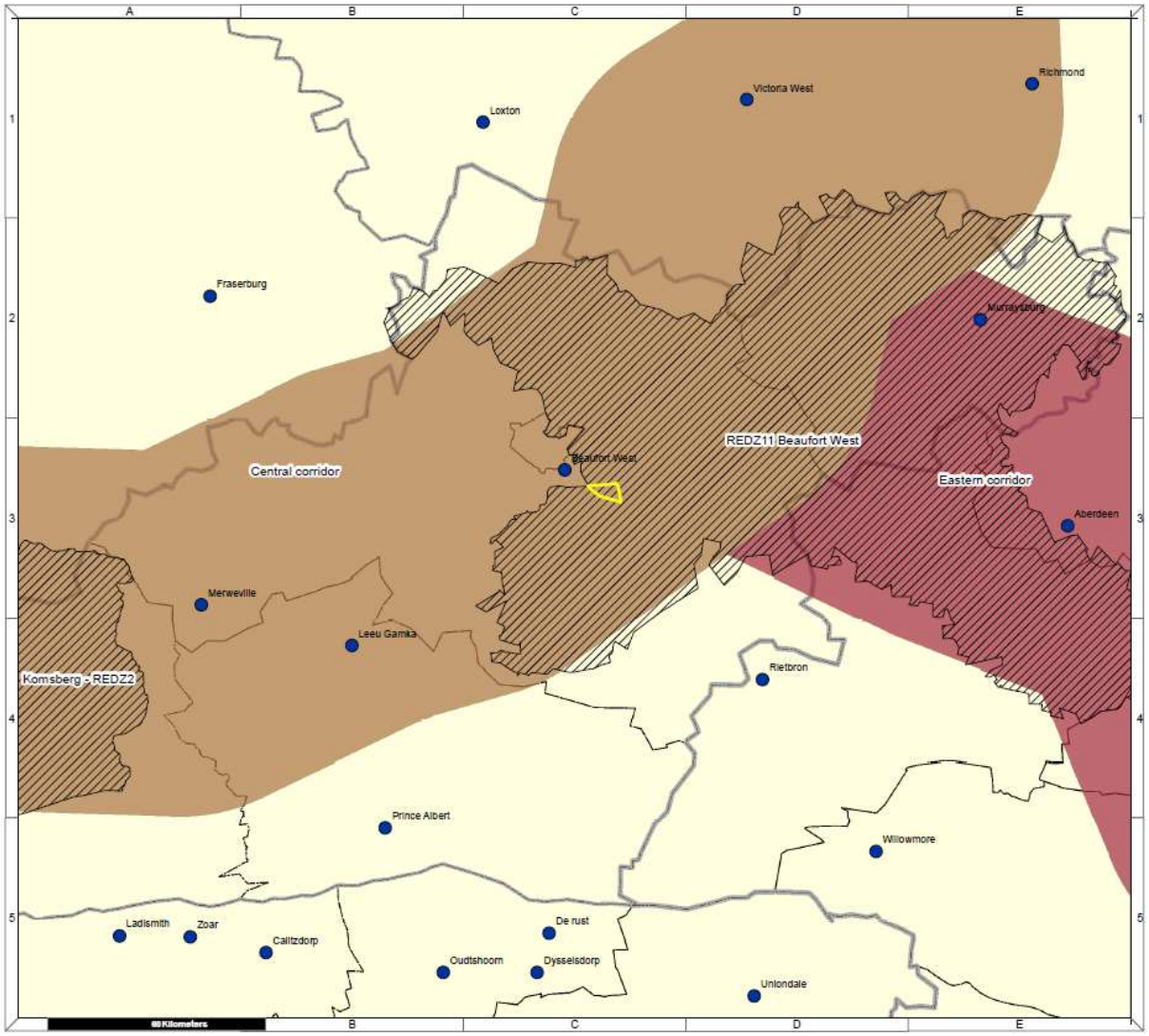


Figure 23: Renewable Energy Development Zones (REDZ), RE farm 423 falls within Beaufort West REDZ (REDZ11)

2.10.1.4 Current land use

The site is located in the Karroo Region of the Western Cape. It is within the arid zone of South Africa where the rainfall is low and erratic, and where the main farming activity is sheep and goat production. Crop production in general only takes place where there is irrigation water available. Occasionally, opportunistic cropping is practiced and then only after rainwater had been stored in the soil profile do the crops have a reasonable chance to get mature. The Remaining Extent (Portion 0) of Farm 423 is currently used for low intensity small livestock grazing.

According to the Department of Agriculture, Land Reform and Rural Development (DALRRD), the land falls into Class VII and is considered as low potential land suitable only for livestock and conservation.

2.10.1.5 The solar irradiation

The economic viability of a solar PV facility is directly dependent on the annual solar irradiation at the site. Beaufort West falls within the greater Karoo District which receives some of the highest Global Horizontal Irradiation (GHI) outside of the Northern Cape, South Africa. The GHI for the Beaufort West region varies between 2,050 and 2,080 kWh/m2/annum. More specifically, the GHI for the Bulskop PV Cluster is in the region of approximately 2,070 kWh/m2/annum. The irradiation level is an important

factor in a highly competitive bidding environment under REIPPPP; the economic viability of a project is a critical success factor.

2.10.1.6 Proximity to access road for transportation of material and components

The proximity of the site to the N1 and R61 decreases the impact on secondary roads from traffic during the construction and operation phases. As material and components would need to be transported to the project Site during the construction phase of the project, the accessibility of the Site was a key factor in determining the viability of the project, particularly taking transportation costs (direct and indirect) into consideration and the impact of this on project economics and therefore the ability to submit a competitive bid under the Department of Energy's (DoE) REIPPPP.

2.10.1.7 Landowner support

The selection of a site where the landowner is supportive of the development of renewable energy is essential for ensuring the success of the project. The landowner does not view the development as a conflict with their current land use practices. The support from the landowner for the development to be undertaken on the affected property has been solidified by the provision of the consent for the project to proceed on the property through the signing of a land lease agreement with the developer.

The applicant Bulskop PV (Pty) Ltd has an established relationship with the landowner of Remaining Extent (Portion 0) of Farm 423 due to developing several PV projects within the greater area.

2.10.2 Footprint selection

The selection of the proposed study area within the Remaining Extent of Farm 423 followed a risk adverse, bottom-up approach in order to ensure that the impacts of the proposed developments can be avoided as far as possible. This avoidance approach reduces the degree of mitigation required in order ensure that potential environmental impacts are within acceptable levels.

The initial study area consisted of the entire property being the entire Remaining Extent of Farm 423 which was selected as per the criteria identified in the previous section.

Figure 24: Initial/ Conceptual Study Area (Bulskop PV(Pty) Ltd, 2022)

The initial study area did not consider any environmental sensitive areas was driven primarily by the factors detailed in the previous section.

Following the identification of the initial/ conceptual study area, various specialists (ecology, heritage (inclusive of archaeology), palaeontology, aquatic/ freshwater and avifauna) were appointed to assist in the site selection process. Each of the specialists mapped the sensitive areas of the initial/ conceptual study area (i.e., the entire farm portion) following a site visit.

The site sensitivities indicated that an area of approximately 1,570 ha on the eastern portion of the property was suitable for the development of solar PV (this is illustrated in the green polygon in the image below). The preferred layout alternative for Bulskop PV was then determined. This preferred layout (yellow polygon in the image below) was determined in such a manner as to avoid all high and very high sensitivity areas.

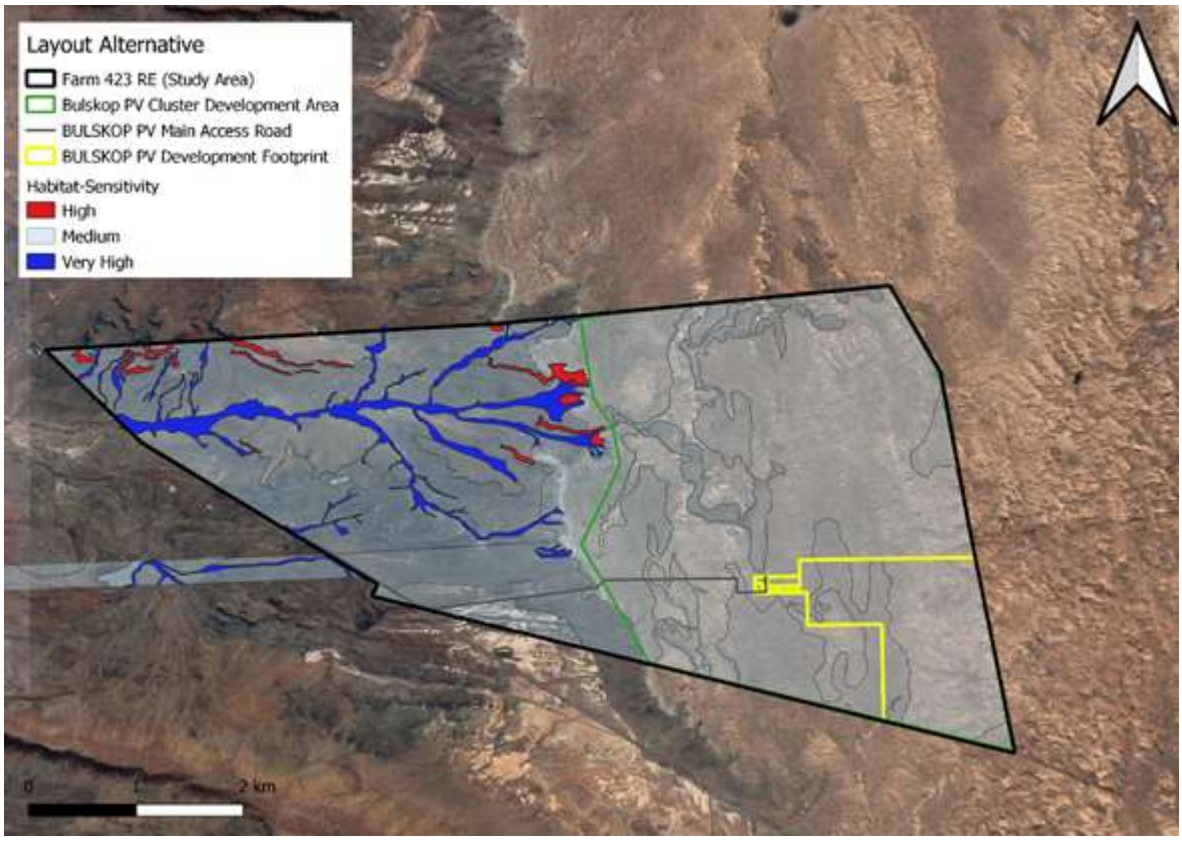


Figure 25: Ecological Sensitivity for Bulskop PV.

This extensive upfront consultation with the various specialists mitigated many of the impacts associated with the planning and design phase.

2.11 CONSIDERATION OF ALTERNATIVES

Bulskop PV will consist of solar PV technology with fixed, single or double axis tracking mounting structures, with a net generation (contracted) capacity of 120 MW_{AC} as well as associated infrastructure.

In terms of the of the guidelines on consideration of alternatives, alternatives can include:

- Site Alternatives (please refer to the site selection process detailed in section 2.10).

- Technology Alternatives (please refer to section 2 where technology alternatives are discussed in further detail).
- Layout Alternatives (discussed below).

In compliance with the regulations, as a minimum, the No-Go Alternative must be considered and assessed.

2.11.1 Layout Alternatives

As mentioned earlier in this report (when describing the site selection process), the total Farm was analysed by relevant specialists to determine the sensitivity. The layout was then developed taking into account the sensitivities identified by the participating specialists.

Therefore, the preferred layout alternative (Layout Alternative 1) within the initial/ conceptual area was the only layout alternative assessed for Bulskop PV. Layout Alternative 1 predominantly occupies only medium sensitivity areas, with only the access road crossing an area of high sensitivity.

This preferred layout proposed in this report (Layout Alternative 1) has thus gone through multiple stages of refinement until its current stage that has been accepted by all specialists as being the best practicable environmental option.

2.11.1.1 Initial Assessment Area

Portion 0 of the Farm 423, situated within the Central Karoo District Municipality of the Western Cape Province, was identified for the development of the proposed Bulskop PV (see the site selection process outlined in section 2.10).

The initial study area consisted of the entire property 2667.0374[22] ha in extent as shown in the image below.

[22] Please refer to Site Selection Matrix (October 2021) for details on the property selection process.

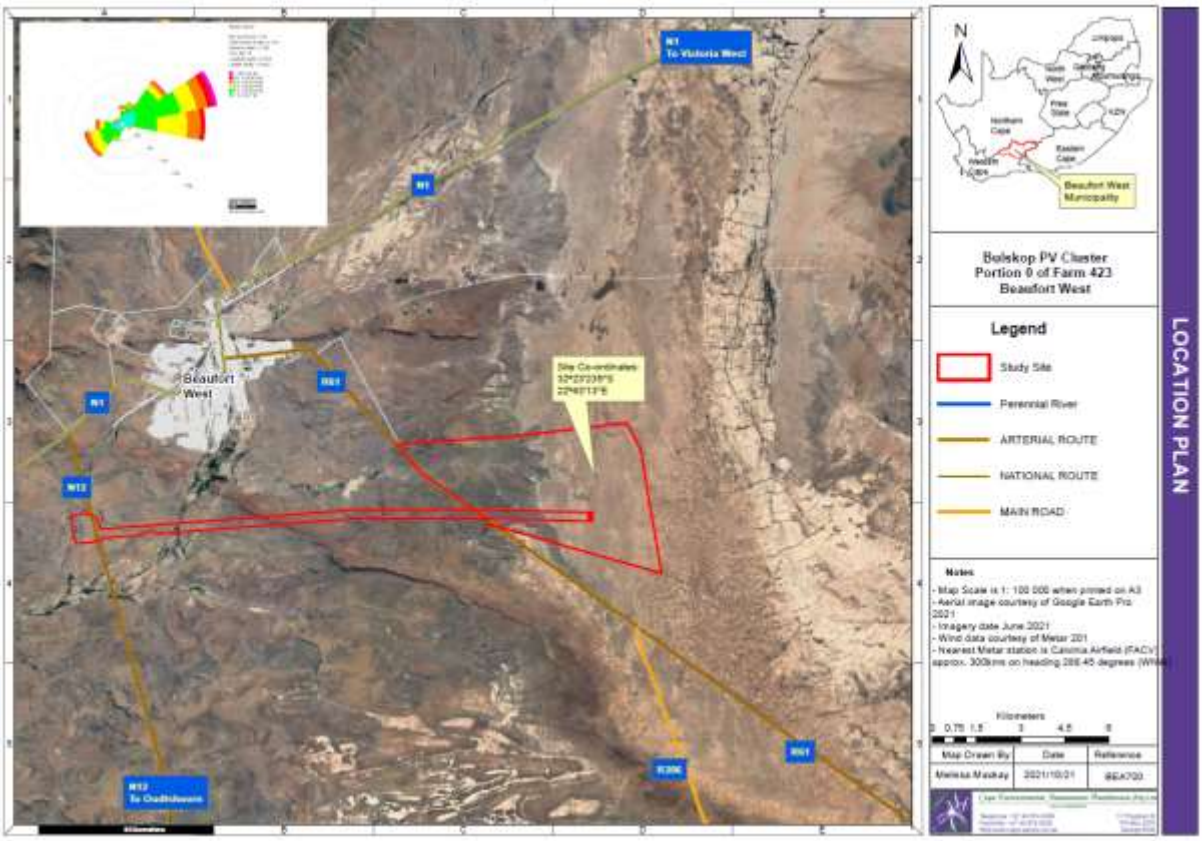


Figure 26: Initial/ Conceptual Study Area

The initial study area did not consider any environmental sensitive areas and was driven primarily by its proximity to the R61 access road as well as reduced overhead powerline (OHL) distance to connect into the Droerivier Main Transmission Substation (MTS), located ± 17.5 km to the west of Bulskop PV.

2.11.1.2 Site Sensitivity Screening

Following the identification of the initial/ conceptual study area, various specialists (ecology, heritage (inclusive of archaeology), palaeontology, aquatic/ freshwater and avifauna) were appointed to assist in the site selection process. Each of the specialists mapped the sensitive areas of the initial/ conceptual study area following a site visit. The site sensitivities indicated that an area of approximately 1,570 ha on the eastern portion of the property was suitable for the development of solar PV, as illustrated in green in the figure below. The preferred layout alternative for Bulskop PV identified during the planning and design phase, aimed to avoid all areas with a high sensitivity.

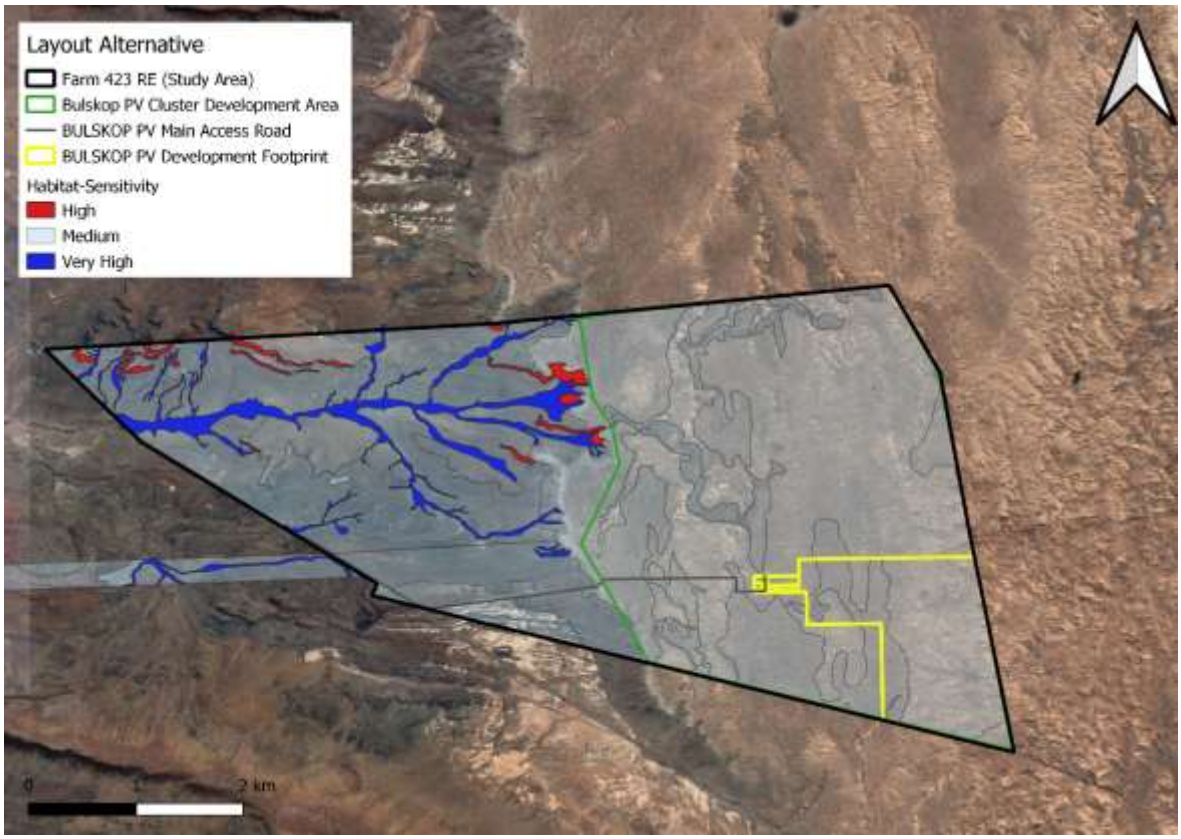


Figure 27: Ecological Sensitivity for Bulskop PV

2.11.1.3 Layout Alternative 1 (Preferred)

Based on the outcome of the site sensitivity screening, the preferred layout alternative (Layout Alternative 1) as depicted below was developed.

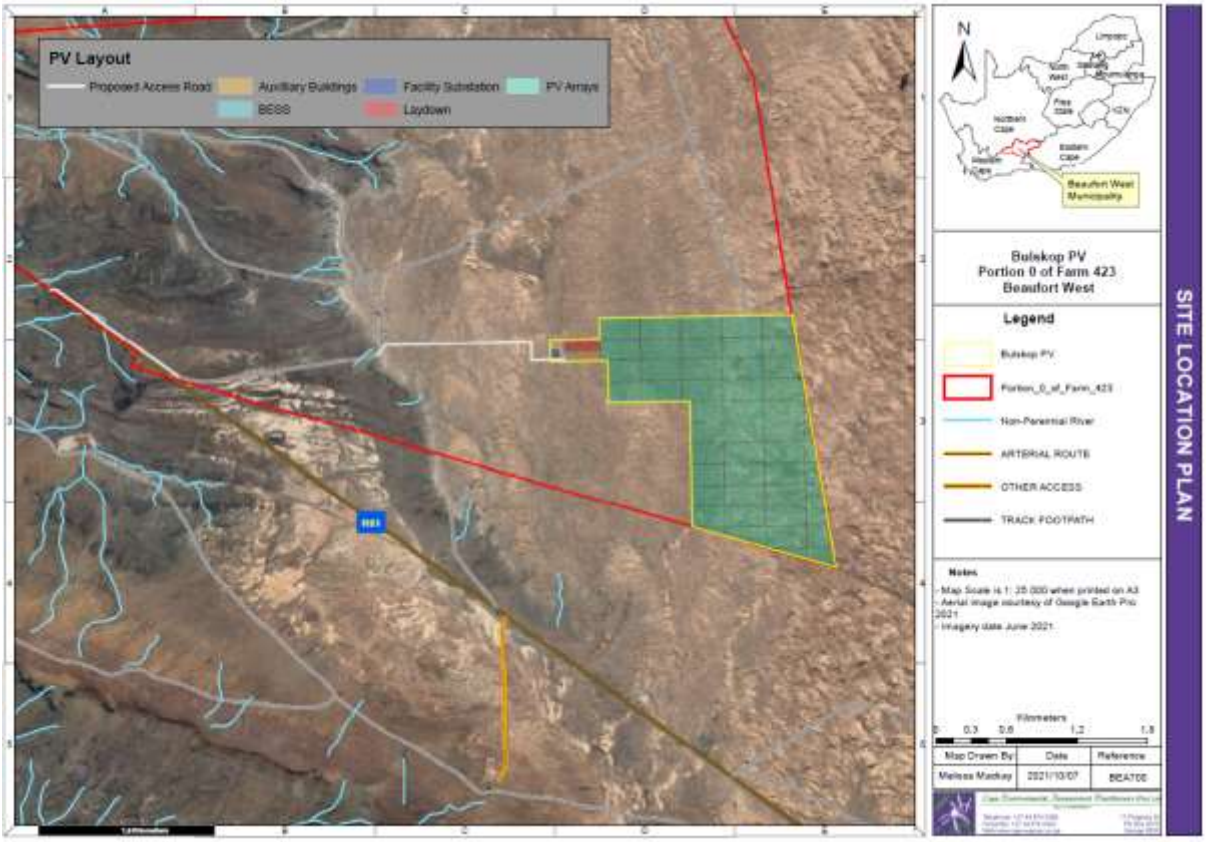


Figure 28: Layout Alternative 1 (preferred) for Bulskop PV.

2.11.2 Grid Connection Alternatives

The grid connection for Bulskop PV is being assessed as part of a separate environmental process, the alternatives in respect of the grid connection will be discussed in that environmental process.

2.11.3 Access Road Alternatives

As detailed in section 2 of this report, the existing farm access was initially proposed to access the project. The traffic specialist however confirmed that the existing access is not a feasible access option due to the inadequate sight distance.

The proposed facility will be accessed via a new proposed access point located off the R61 at Latitude: 32°23'57.47"S, Longitude: 22°40'15.36"E. The proposed access point will be located approximately 1.3 km from the existing farm access where sight lines are deemed adequate.

2.11.4 The no-go alternative

The no-go Alternative (or status quo) proposes that Bulskop PV does not go ahead and that the area in proximity to the Eskom Droerivier MTS and within a Renewable Energy Development Zone remain undeveloped as it is currently.

The land on which the Bulskop PV is proposed is currently vacant. It is currently used for limited game and livestock grazing activities, however due to a combination of factors, it has no potential for irrigated crop cultivation (this has been confirmed by the Agricultural Specialist.

The solar-power generation potential of the Beaufort West Region, particularly in proximity to the existing substations and within the REDZ is significant and will persist should the no-go alternative occur.

The no-go alternative will limit the potential associated with the land and the area as a whole for ensuring energy security locally, as well as the meeting of renewable energy targets on a provincial and national scale. Should the no-go alternative be considered, the positive impacts associated with Bulskop PV (increased revenue for the farmer, economic investment, local employment and generation of electricity from a renewable resource) will not be realised.

The no-go alternative is thus not considered a favourable option in light of the benefits associated with the proposed Bulskop PV; however, it will be used as a baseline from which to determine the level and significance of potential impacts associated with the proposed Bulskop PV.

2.11.5 Comparison of alternatives

The table below reflects the key environmental advantages and disadvantages of the two layouts (i.e., the preferred and initial assessment area and the access road alternatives including the identification of the preferred alternatives in each case[23].

Table 6: Comparison of Advantages and Disadvantages of Layout and Access Road Alternatives described above.

Alternative	Preference	Reasons (incl. potential issues)
PV Layout Alternatives		
Layout Alternative 1	Preferred	- Limited to habitat of Medium Sensitivity. - Topographically suitable. - Avoids all high and very high ecologically sensitive areas. - Avoids all high and very high hydrologically sensitive areas. - Avoids all very high avifaunal sensitive areas (namely the ridges, watercourses and their associated buffers).
Initial Assessment Area	Portions Less Preferred, eliminated from further assessment	- Portions of the initial assessment area are topographically unsuitable for the development of PV. - Portions of the initial assessment area consist of high and very high ecologically sensitive areas. - Portions of the initial assessment area high and very high hydrologically sensitive areas. - Portions of the initial assessment area are within areas with a very high avifaunal sensitivity and their buffers.
Access Road Alternatives		
New Access Point	Preferred	- Sufficient site distances
Existing Farm Access	Least Preferred	- Insufficient site distances.

Layout alternative 1 and the access road from the new proposed access road will be assessed against the no go alternative for the purposes of this Basic Assessment.

2.12 PROJECT PROGRAMME AND TIMELINES

As mentioned previously Bulskop PV is intended to be bid into the REIPPPP. The programme has definite and stringent timelines that the project needs to meet. Note that the DoE has not yet released the exact dates of the bidding schedules, so the implementation schedule below is based on the best available information we have at this time and is subject to change.

[23] The comparative assessment of the grid connection alternatives is not included in this report, as these are being assessed as part of a separate Basic Assessment Process.

Table 7: Preliminary implementation schedule.

	Description	Timeline
1	Expected REIPPPP submission date (6th round)	Third Quarter of 2022
2	Preferred bidders selected	First Quarter 2023
3	Finalisation of agreements	Second Quarter 2023
4	Procurement of infrastructure	First Quarter 2024
5	Construction	2024
6	Commissioning	2024

The table above clearly depicts the dependence of the project on the REIPPPP's timelines. Any delay or acceleration within the REIPPPP will have a corresponding effect on the timelines of the projects. Also, as mentioned, no official public submission date for Round 6 has been communicated by the DoE.

NOTE: Bulskop PV intends submitting their bid during the 6th bidding window or thereafter if unsuccessful in immediate bidding rounds. Due to the uncertainty regarding the timing of these bidding windows, the Department is herewith requested that the validity period of the environmental authorisation (if authorised) be for the full 10 year allowable in terms of the regulations.

3. LEGISLATIVE AND POLICY FRAMEWORK

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

3.1 NATIONAL LEGISLATION

This section deals with nationally promulgated or nationally applicable legislation associated with the proposed Bulskop PV[24].

3.1.1 The Constitution of the Republic of South Africa

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

The Constitution and Bill of Rights provides that:

Everyone has the right:

- to an environment that is not harmful to their health or well-being; and
- to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures:
    - prevent pollution and ecological degradation
    - promote conservation; and
    - secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.

NEMA (discussed below) is the enabling legislation to ensure this primary right is achieved.

3.1.2 National Environmental Management Act (NEMA)

[24] This section has been prepared with input from the Social Specialist (see Annexure E9)

The current assessment is being undertaken in terms of the **National Environmental Management Act** (NEMA, Act 107 of 1998)[25]. This Act makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the competent authority (in this case, the national Department of Environmental Affairs, DEA) based on the findings of an Environmental Assessment.

The proposed development entails a number of listed activities, which would normally require a Scoping & Environmental Impact Reporting process, but due to the project falling within a legislated REDZ, only requires a Basic Assessment Process. Such a process must be conducted by an independent EAP. Cape EAPrac has been appointed to undertake this process. The figure below depicts a summary of the Basic Assessment process.

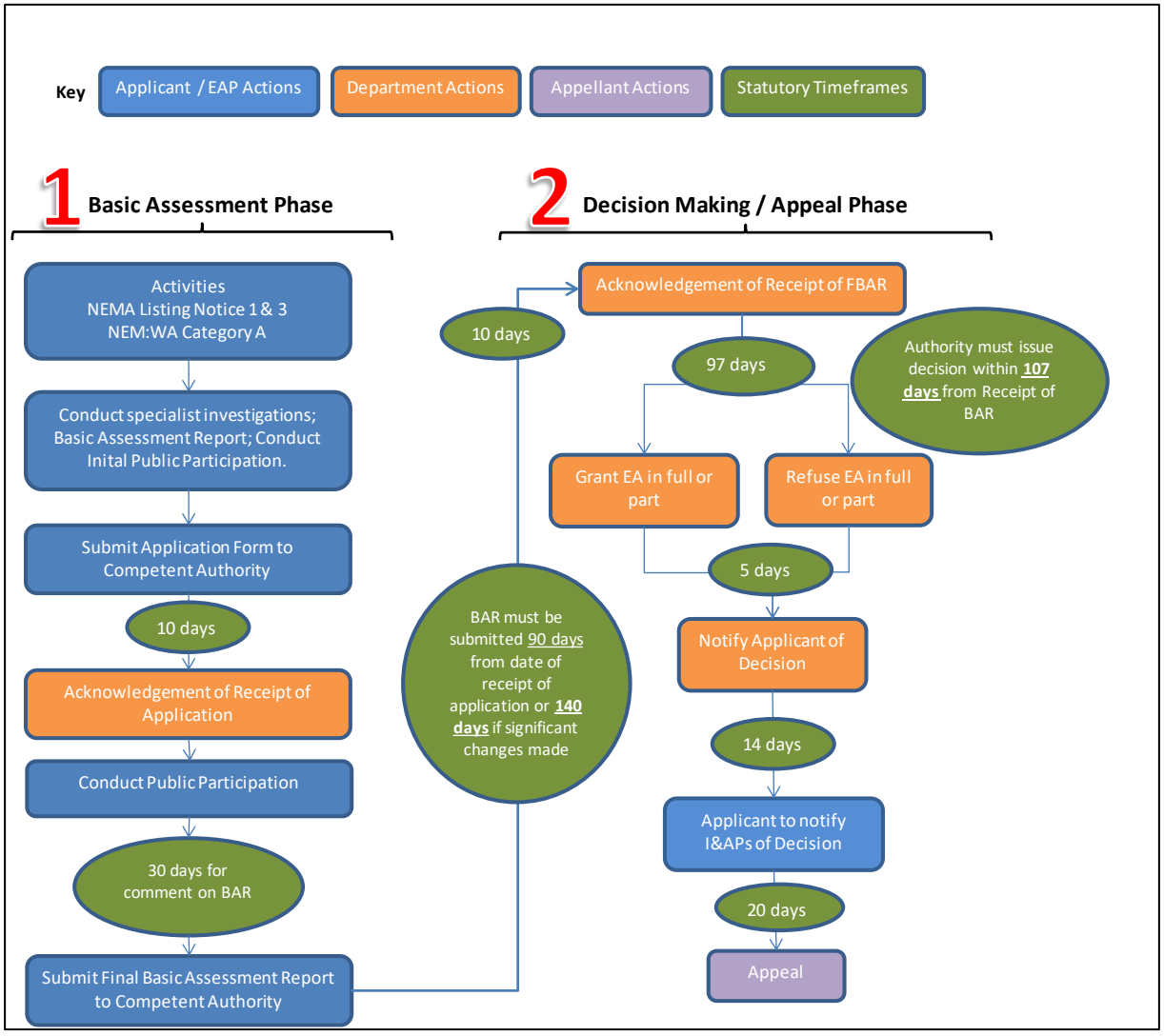


Figure 29: Summary of Basic Assessment Process in terms of the 2014 Regulations (as amended).

The listed activities associated with the proposed development, as stipulation under 2014 Regulations **327, 325 and 324** are as follows:

[25] The Minister of Water and Environmental Affairs promulgated new regulations in terms of Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998), viz, the Environmental Impact Assessment (EIA) Regulations 2014 (as amended in April 2017). These regulations came into effect on 08 December 2014 (amended on 07 April 2017) and replace the EIA regulations promulgated in 2006 and 2010.

Table 8: NEMA 2014 (As amended in April 2017) listed activities applicable to Bulskop PV.

Activity No(s):	Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Portion of the proposed project to which the applicable listed activity relates.
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	The Bulskop PV onsite substation will have a capacity of up to 132 kilovolts.
12	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The main access road for Bulskop PV crosses a watercourse. The footprint of this main access road within 32 m of the watercourse will exceed 120 square metres.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The main access road for Bulskop PV crosses a non perennial watercourse. The construction of this access road will require the movement of more than 10 cubic metres of soil from within this watercourse.
24	The development of a road— (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	The main access road for Bulskop PV will up to 10 metres in width.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	The proposed Bulskop PV is considered commercial / industrial use with a total footprint of approximately 268 ha.
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— ((ii) where no reserve exists, where the existing road is wider than 8 metres;	The Main access road to Bulskop PV follows an existing farm access (which is wider than 10 m at the intersection with the R61). This existing farm access will be lengthened by more than 1 kilometre.
Activity No(s):	**Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	**Portion of the proposed project to which the applicable listed activity relates.**
1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,	The proposed Bulskop PV will have a generation capacity of up to 120 MWac.
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The proposed Bulskop PV will have a total footprint of approximately 268 ha.
Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Portion of the proposed project to which the applicable listed activity relates.**
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation;	The main access road for Bulskop PV will be up to 10 m wide outside of an urban area containing indigenous vegetation.
12	The clearance of an area of 300 square metres or more of indigenous vegetation. i. Western Cape ii. Within critical biodiversity areas identified in bioregional plans;	Portions of the proposed Bulskop PV fall within a CBA 1 and CBA2 in terms of the Western Cape Biodiversity Spatial Plan. The clearance of more than 300 square metres will be required within these CBA's.
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. Western Cape ii. All areas outside urban areas:	The existing farm access will widened and lengthened by more than 1 km outside of an urban area.

	(aa) Areas containing indigenous vegetation;	

NOTE: Basic Assessment as well as S&EIR Activities are being triggered by the proposed development, but since the project is contained in a legislated REDZ, the Environmental Application Process will follow a Basic Assessment process.

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

3.1.3 National Environmental Management: Biodiversity (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The Draft National List of Threatened Ecosystems (Notice 1477 of 2009, Government Gazette No 32689, 6 November 2009) has been gazetted for public comment.

The list of threatened terrestrial ecosystems supersedes the information regarding terrestrial ecosystem status in the NSBA 2004. In terms of the EIA regulations, a basic assessment report is required for the transformation or removal of indigenous vegetation in a critically endangered or endangered ecosystem regardless of the extent of transformation that will occur. **However, both of the vegetation types on Bulskop PV are Least Concern.**

NEMBA also deals with endangered, threatened and otherwise controlled species. The Act provides for listing of species as threatened or protected, under one of the following categories:

- **Critically Endangered**: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered**: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- **Vulnerable**: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
- **Protected species**: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Certain activities, known as Restricted Activities, are regulated by a set of permit regulations published under the Act. These activities may not proceed without environmental authorization.

Bulskop PV is located in the Southern Karoo Riviere (Least concern) and Gamka Karoo (Least concern) vegetation types. The study area is not located in or proximity to any threatened ecosystem.

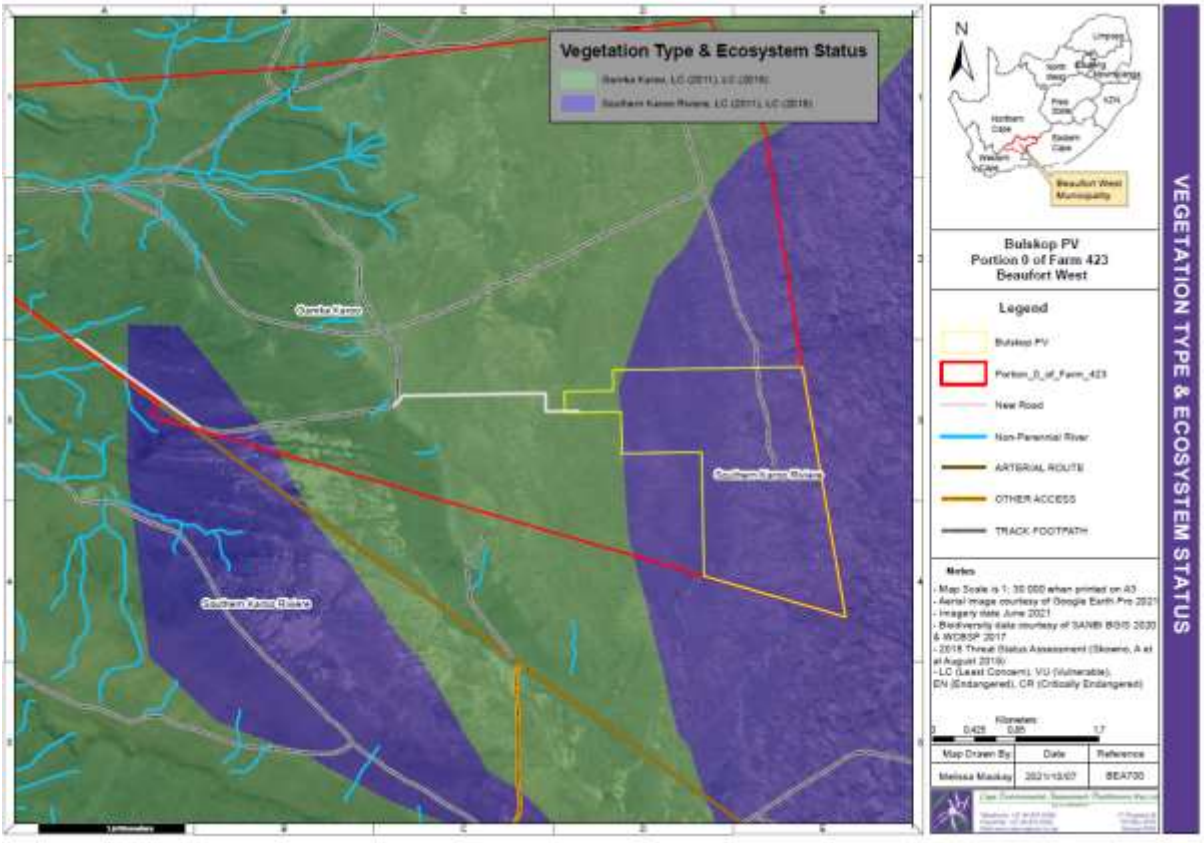


Figure 30: Vegetation Type and Ecosystem Status for Bulskop PV.

According to the Ecological Specialist (Annexure E1), Gamka Karoo vegetation type is found in the Western Cape, Eastern Cape and marginally in the Northern Cape. This vegetation type occurs on extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g., *Chrysocoma ciliata*, *Eriocephalus ericoides*) with rare low trees (e.g., *Euclea undulata*). It occurs at an altitude of 500-1100 m.

The national target for conservation protection for both these vegetation types is 16%, with about 2% statutorily conserved in the Karoo National Park and some in private reserves, such as Steenbokkie Private Nature Reserve.

The Southern Karoo Riviere vegetation type is found in the Western and Eastern Cape Provinces. This vegetation type occurs along narrow riverine flats supporting a complex of *Vachellia karroo* or *Tamarix usneoides* thickets (up to 5 m tall) and fringed by tall Salsola-dominated shrubland (up to 1.5 m high), especially on heavier (and salt-laden) soils on very broad alluvia.

The national target for conservation protection for this vegetation types is 24%, but only about 1.5% statutorily conserved in the Karoo National Park as well as in the Aberdeen, Bosberg, Commando Drift, Gamkapoort and Karoo Nature Reserves and in about 10 private reserves, mainly set up for game farming.

3.1.4 Conservation of Agricultural Resources Act – CARA (Act 43 of 1983):

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

- Category 1 - prohibited and must be controlled;
- Category 2 – must be grown within a demarcated area under permit; and

- Category 3 - ornamental plants that may no longer be planted, but existing plants may remain provided that all reasonable steps are taken to prevent the spreading thereof, except within the flood lines of water courses and wetlands.

The abundance of alien plant species on the Bulskop PV site is very low, which can be ascribed mainly to the aridity of the site.

The Department of Agriculture, Land Reform and Rural Development is guided by Act 43 of 1983.

In order to comply with their mandate in terms of this legislation, the applicant is required to take note of the following:

Article 7.(3)b of Regulation 9238: Conservation of Agriculture Resources, 1983 (Act 43 of 1983) deals with the Utilisation and protection of vleis, marshes, water sponges and water courses

- 7.(1) "no land user shall utilize the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 meters horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agriculture resources."
- (3)(b) "cultivate any land on his farm unit within the flood area of a water course or within 10 meters horizontally outside the flood area of a water course".

Kindly refer to the Aquatic Biodiversity Impact Assessment in Appendix E3 for a discussion of potential impacts on the freshwater resources on site. As confirmed in this specialist report, all the main drainage lines have been completely avoided by the proposed Bulskop PV with the exception of a single watercourse crossing associated with the main access road.

3.1.5 The Subdivision of Agricultural Land, Act 70 Of 1970

The Subdivision of Agricultural Land Act 70 of 1970 (SALA") came into operation on 2 January 1971. The Department of Agriculture administers the Subdivision of Agricultural Land Act No. 70 of 1970. Subdivision of agricultural land, therefore, requires consent from the Department of Agriculture.

The Department of Agriculture is considered a commenting authority on this environmental process, but will be a decision-making authority on the SALA application which will take place after the project receives an EA. Please refer to the Planning Statement compiled by Delplan and attached in Appendix E15.

3.1.6 National Water Act, No 36 of 1998

Section 21c & i of the National Water Act (NWA) requires the Applicant to apply for authorisation from the Department of Water and Sanitation for an activity in, or in proximity to any watercourse. Such an application would be required for any access road or PV infrastructure that crosses any watercourse.

Section 21(a) of the National Water Act is related to the abstraction of water from a water resource (including abstraction of groundwater); a Water Use Licence (WUL) would be required for such abstraction.

Water required for the construction and operation of Bulskop PV is to be sourced from the Beaufort West Local Municipality (who have been engaged to provide confirmation of availability). Should the applicant in the future, wish to utilise groundwater for the purposes of construction or operation of the facility, such use will require a licence in terms of Section 21(a) of the NWA.

The freshwater specialist has that the topographical data does not indicate the presence of water resources within the study area, however a portion of the development area overlapping an area classified as a "dry" plain. This is consistent with the habitat classification for this area, namely the Southern Karoo Riviere Plains. The freshwater specialist has confirmed that no watercourses are present on the proposed PV footprint. The proposed access road to the PV footprint does however traverse a non-perennial watercourse. Further to this there were no wetland systems within the footprint of the proposed facility.

The Department of Water and Sanitation as well as the Breede Gouritz Catchment Management Agency have been registered as a key stakeholder to provide input into in this environmental process.

The assessment of the aquatic biodiversity impacts (in Annexure E1) has been completed in accordance with the requirements of the published General Notice (GN) 509 by the Department of Water and Sanitation (DWS). Such an assessment is undertaken in the form of a Risk Assessment Matrix. Please refer to the detailed risk matrix in annexure E1 and the summary of the outcomes of this risk assessment in the table below.

Table 9: Summary of Aquatic Risk Assessment.

Impact Activity	Risk Rating without Mitigation	Risk Rating with mitigation
Construction Phase		
Clearing associated with construction of roads and laydown yards	Low	Low
Final landscaping and post-construction rehabilitation	Low	Low
Stormwater Management Infrastructure	Medium	Low
Erosion and sedimentation control measures	Low	Low
Pollution Control	Low	Low
Staff ablutions	Low	Low
Operation of machinery & equipment	Low	Low
Temporary infrastructure	Low	Low
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Medium	Low
Increased traffic and human disturbance (maintenance)	Low	Low
Alien invasive plants	Low	Low
Decommissioning of the solar facility.	Low	Low
Construction Phase		
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Medium	Low
Increased traffic and human disturbance (maintenance)	Low	Low
Alien invasive plants	Low	Low
Decomisioning Phase		
Decommissioning of the solar facility.	Low	Low

The risks associated with the proposed development area range from low to moderate, with moderate risks associated with the drainage lines in proximity to the access route. The proposed layout will avoid these drainage lines except for the crossing points associated with main Bulskop access road. It is therefore understood that a General Authorisation in terms of the National Water Act (NWA) would be appropriate in this regard.

3.1.7 National Forests Act (No. 84 of 1998):

The National Forests Act (NFA) provides for the protection of forests as well as specific tree species, quoting directly from the Act: "*no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence*

or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated".

The ecological specialist has not identified any species protected in terms of the National Forest Act on site.

3.1.8 National Heritage Resources Act, 25 of 1998

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

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

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

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- any development or other activity which will change the character of a *site* exceeding 5 000 m² in extent; and
- the re-zoning of a site exceeding 10 000 m^2 in extent.

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority (in this case, Heritage Western Cape).

- In terms of Section 36 (3), no person may destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority (in this case, Heritage Western Cape).
- In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority (In this Case, Heritage Western Cape).

Ms Jenna Lavin from CTS Heritage has undertaken a heritage impact assessment for the proposed Bulskop PV. This heritage impact assessment includes an Archaeology Impact Assessment, Cultural Landscape Assessment and a Palaeontology Impact Assessment. Please refer to Appendices E4 – E7 for copies of these studies.

In compliance with the Heritage Western Cape procedural requirements, a Notification of Intent to Develop (NID)[26] was submitted to HWC for the cluster of PV projects on 13 September 2021 (see NID application and proof of submission – Annexure G7).

In response to the NID, HWC issued a case number (CASE NUMBER: 21091004SB0913E) and specified the terms of reference for the heritage study (see NID Response – Annexure G7). As per the requirements of the HWC, an integrated Heritage Impact Assessment (HIA) including archaeology, cultural landscape (including VIA) and palaeontology was undertaken and an integrated HIA report compiled (see Appendix E4). The integrated HIA was released to registered conservation bodies (in this

[26] The NID submitted to Heritage Western Cape proposed noted the facility to have a maximum generation capacity of 100MW. This has subsequently been amended to 120MW within the same footprint. This amendment will be communicated to Heritage Western Cape by the Heritage Practitioner at the IACom meeting on 13 April 2022.

case the Simon van der Stel Foundation) for a 30-day consultation period between 2 February 2022 and 4 March 2022 (see Proof of Notification - Appendix G7) during which time no comments were received. Following the consultation period, the HIA was submitted to HWC for final comment on 8 March 2022 (see proof of submission – Appendix G7) and is scheduled to be tabled at the next available IACom meeting (13 April 2022). Once a final comment has been issued by the HWC, the recommendations will be included in the draft EMPr.

The heritage studies are included in Annexures E4 – E7 of this draft BAR are also available to other Interested and Affected Parties (I&APs) for a 30-day public comment period.

3.1.9 National Energy Act (No. 34 of 2008)

The purpose of the National Energy Act (No. 34 of 2008) is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation; while taking environmental management requirements into account. In addition, the Act also provides for energy planning, and increased generation and consumption of Renewable Energies.

The objectives of the Act, are to amongst other things, to:

- Ensure uninterrupted supply of energy to the Republic.
- Promote diversity of supply of energy and its sources.
- Facilitate energy access for improvement of the quality of life of the people of the Republic.
- Contribute to the sustainable development of South Africa's economy.

The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life. The Act provides the legal framework which supports the development of Renewable Energy facilities for the greater environmental and social good and provides the backdrop against which South Africa's strategic planning regarding future electricity provision and supply takes place.

3.2 PROVINCIAL LEGISLATION

This section deals with provincially promulgated or provincially applicable legislation associated with the proposed Bulskop PV[27].

3.2.1 Astronomy Geographic Advantage Act, 2007 (Act No 21 Of 2007)

The purpose of the Act is to preserve the geographic advantage areas that attract investment in astronomy. The entire Northern Cape Province, excluding the Tsantsabane Municipality, has been declared an astronomy advantage area. The Northern Cape optical and radio telescope sites were declared core astronomy advantage areas. The Act allowed for the declaration of the Southern Africa Large Telescope (SALT), Meerkat and Square Kilometre Array (SKA) as astronomy and related scientific endeavours that has to be protected.

Chapter 2 of the act allows for the declaration of astronomy advantage areas whilst Chapter 3 pertains to the management and control of astronomy advantage areas. Management and control of astronomy advantage areas include, amongst others, the following:

- Restrictions on use of radio frequency spectrum in astronomy advantage areas;
- Declared activities in core or central astronomy advantage area;
- Identified activities in coordinated astronomy advantage area; and

[27] This section includes input from the Social specialist (Annexure E9)

- Authorisation to undertake identified activities.

The Bulskop PV facility is not within the Geographic Advantage Area, as it is situated outside of the Northern Cape. It was furthermore found to be situated more than 150km from the closest SKA station (SKA133).

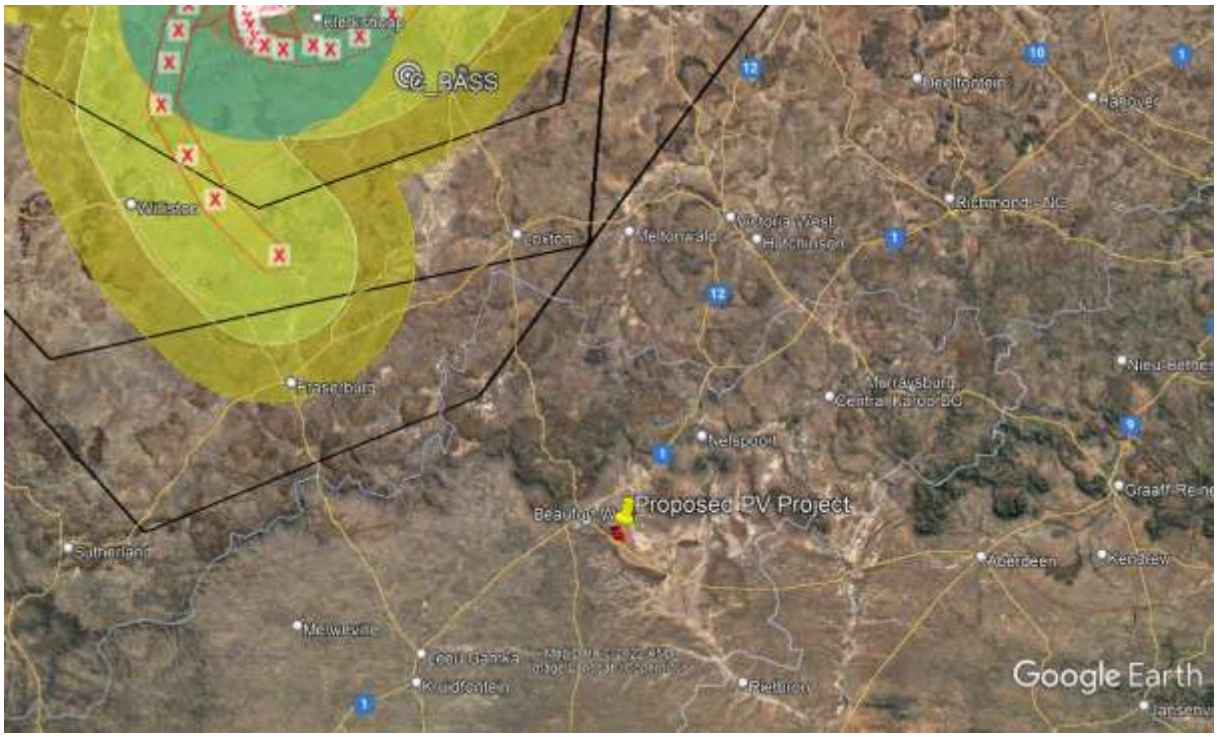


Figure 31: Proposed Bulskop PV in relation to the SKA Declared Areas

The South African SKA Project Office and the South African Radio Astronomy Observatory (SARAO) have been registered as a key stakeholder on this environmental process and have been requested to provide input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA.

3.2.2 Western Cape Land Use Planning Act (Act 16 of 2013)

In line with the Spatial Planning and Land Use Management Act, (Act 16 of 2013), the Western Cape Land Use Planning Act 2014 (LUPA) was adopted by the provincial government of the Western Cape in April 2014. Chapter III (which deals with spatial planning matters) sets out the minimum requirements for drafting a Provincial Spatial Development Framework (PSDF) for the WCP.

Of specific relevance, Section 4 requires a PSDF to (3) 'contain at least (c) provincial priorities, objectives and strategies, dealing in particular with (iii) adaptation to climate change, mitigation of the impact of climate change, renewable energy production and energy conservation'. This requirement would apply to all future revisions of the PSDF. As such, it indicates the provincial government of the Western Cape's commitment to renewable energy production in order to respond to climate change.

3.2.3 Western Cape Amended Zoning Scheme Regulations for Commercial Renewable Energy Facilities (2011).

Amendments to the Western Cape Land Use Ordinance (1985) (LUPO) were promulgated in 2011 in order to guide the development of commercial renewable energy generation facilities (REFs), mainly wind and solar. The Zoning Scheme amendments are specifically intended to provide guidance with regard to land use compatibility, and applicable development restrictions and conditions, including

provision for mandatory rehabilitation post construction and final decommissioning ("abandonment" in terms of the Provincial Notice). The ambit of the Regulations includes all REFs as well as associated ("appurtenant") infra/ structure(s) operated for commercial gain, irrespective of whether such feed into the electricity grid or not. The section below provides an overview of key points of relevance to the proposed PV Development.

3.2.3.1 Zoning status

In terms of zoning status, "renewable energy structures" are designated as a consent use in the zone Agriculture I.

3.2.3.2 Land use restrictions

Restrictions with regard to height are mainly applicable to wind energy facilities (WEFs) but associated on-site buildings for all REFs are limited to a maximum of 8,5 m (ground to highest point of roof).

Restrictions with regard to setback are only applicable to WEFs.

3.2.3.3 Establishment of a Rehabilitation Fund

Prior to authorisation, the applicant ("owner") must make financial provision for the rehabilitation or management of negative environmental impacts, as well as of negative impacts associated with decommissioning or abandonment of the facility. Such provision should be in the form of a fund to be administrated by the Municipality, and should be to the satisfaction of the competent authority (i.e. Department of Energy).

3.2.3.4 Land clearing/ erosion management

- Land clearing should be limited to areas considered essential for the construction, operation and decommissioning of a Renewable Energy Facility.
- All land cleared during construction which does not form part of the Renewable Energy Facility structural footprint, must be rehabilitated in accordance with an approved rehabilitation plan.
- Soil erosion must be avoided at all costs, and any high-risk areas should be rehabilitated.

3.2.3.5 Visual impact management

- Visual and environmental impacts must be considered, to the satisfaction of the competent authority.
- Associated structures (i.e., substations, storage facilities, control buildings, etc.) must be screened from view by indigenous vegetation, and/or located underground, or be joined and clustered to avoid adverse visual impacts. In addition, appurtenant structures must be architecturally compatible with the receiving environment.
- Lighting should be restricted to safety and operational purposes, must be appropriately screened from adjacent land units, and should also be in accordance with applicable Civil Aviation Authority requirements.

3.2.3.6 Operational management and maintenance

- REFs may not cause or give rise to any noise or pollution, deemed to be a nuisance in terms of applicable Environmental Impact Assessment (EIA) regulations or Municipal by-laws.
- The PV Facility owner/ operator is responsible for maintaining the facility in a good condition, including with regard to painting, structural repairs, on-going rehabilitation measures (e.g., erosion), as well as the upkeep of safety and security measures.

3.2.3.7 Decommissioning management

- An PV Facility which has reached the end of its lifespan or that has been abandoned must be removed. The owner (operator) is responsible for the removal of such structures in whole, no longer than 150 days after the date of discontinued operation, and the land must be rehabilitated to the condition it was in prior to construction of the facility.

- Decommissioning activities must include the removal of all PV Facility structures, associated structures, as well as transmission lines; the disposal of solid and hazardous waste according to applicable waste disposal regulations; and the stabilisation and re-vegetation of the site. In order to minimise disruptive impacts on vegetation, soils, etc., the competent authority may grant approval not to remove any underground foundations or landscaping.

3.3 REGIONAL AND MUNICIPAL LEGISLATION

This section deals with regionally and municipally promulgated or regionally or municipally applicable legislation associated with the proposed Bulskop PV[28][29].

3.3.1 Beaufort West Municipality Integrated Development Plan (2017-2022)

The vision for the Beaufort West Local Municipality as set out in the IDP (2017-2022) is “Beaufort West, economic gateway in the central Karoo, where people are developed and live-in harmony together”. The mission is “to reflect the will of the South African people as reflected in the Constitution and by Parliament. In so doing the municipality aims to:

- To provide excellent services to the residents of Beaufort West Local Municipality.
- To reduce poverty and promote the empowerment of women, youth and people living with disabilities.
- To create a crime-free, safe, and healthy environment.

The IDP lists the five Key Performance Areas, namely:

- Basic Service Delivery and Infrastructure Development (KPA 1).
- Local Economic Development (KPA2).
- Institutional Development and Municipal Transformation (KPA 3).
- Financial Viability and Management (KPA 4).
- Good Governance and Public Participation (KPA 5).

KPA 1 (Basic Service Delivery and Infrastructure Development) and KPA 2 (Local Economic Development (KPA2) are relevant to the proposed project. However, the IDP notes that the municipality does not have an LED Strategy and Implementation Plan in place.

The key challenges facing the Beaufort West Municipality include:

- Electricity capacity constraints
- Poor maintenance of existing public facilities
- High rate of the unemployment and low household income levels.
- (Identification and implementation of more labour-intensive catalytic projects)
- Sustainable Economic Growth (Speed up economic growth and transform the economy to create decent work and sustainable livelihoods, Strategy for economic growth and inclusion)

The IDP notes that the key objectives associated with KPA 2 include facilitating investment and maintenance of economic and social infrastructure to ensure infrastructure-led economic growth and development. Linked to this is the creation of an investment friendly environment to attract investment to enable growth and job creation. The proposed development has the ability to create employment and attract investment to the area.

The strategies identified to address the challenges facing the municipality include:

[28] This section includes input from the Social specialist (Annexure E9)

[29] This section includes legislation applicable to both the District (Category C) and Local (Category B) municipalities.

- Facilitate development and growth of SMME's.
- Facilitate Education and Skills Development for Cooperatives & SMME's.
- To provide SMME Support and Capacity building.

The establishment of the proposed PV development can assist to support these strategies. The 2017-2022 IDP was informed by a SWOT Analysis which identified a number of challenges facing the municipality of which the following are relevant to the proposed development:

- Access to technology and technological advances.
- Unable to attract skilled staff to the area.
- No formal policy on green energy.
- Rural area with low development opportunities.
- Water scarcity and high electricity costs.
- Revenue and cash constraints with high number of indigents.

The proposed development will not solve all of these challenges. However, the development can contribute towards addressing some of the challenges.

The IDP highlights the risks posed by climate change, noting that the risk is relatively high in Beaufort West Local Municipality as it is an arid area that has always been prone to drought situations. The sectors that are vulnerable to climate change include agriculture and tourism. In terms of renewable energy, the 2017-2022 IDP notes that innovative solutions can contribute towards growth and development of the municipality, including the introduction of solar energy. The IDP also identifies major infrastructure projects that can be implemented to develop and promote economic development in the area, including large wind and solar energy projects subject to appropriate guidelines and siting principles.

A number of community meetings were held as part of the review of the 2017-2022 IDP. The key issues identified in Ward 2 where the proposed project is located included:

- Housing project for Nelspoort, paving of roads, renovation of hall and sport fields.
- Upgrade of water supply infrastructure.
- Upgrading/fencing and provision of toilet and water at cemetery.
- Establishment of a service centre for pensioners.
- Upgrading of the stadium.
- Cleaning of river.
- Provision of school transport for children.

Some of these issues can inform the identification of SED allocations during the operational phase of PV Project.

3.3.2 Beaufort West Local Municipality Spatial Development Framework

The spatial vision for the municipality set out in the 2013 Spatial Development Framework is “Wilderness tourism and transport gateway to the people, mountains and plains of the Central Karoo”. The SDF notes that the implications of this vision are that the main rural economic resource outside of eco-tourism is extensive agriculture.

The growth of this resource depends on improving the carrying capacity of the land through good veld management practices. The SDF does not comment on the potential impact of renewable energy projects on the natural environment. However, it does refer to shale gas exploration and uranium mining and the need to ensure that key areas such as CBAs, conservancies and stewardship areas and visually sensitive landscapes contributing to long term heritage and tourism opportunities should be avoided. However, as indicated above, the site is located within the Beaufort West REDZ. The SDF was prepared in 2013 and therefore pre-dates the establishment of the REDZs in 2018.

In terms of economic function, the SDF notes that Beaufort West the most important settlement in the municipality and also plays a sub-regional role serving other small towns beyond its boundaries, particularly to the west, e.g., Victoria West, Fraserburg, and Loxton. It is also a major refuelling and service stop on the N1 highway for trucks and is an important station on the national rail route between Cape Town and Gauteng.

The SDF lists five main structuring elements, namely:

- The N1 road and adjacent rail route which is the main transport and socioeconomic artery through the municipality.
- The Nuweveld mountains to the north form an impressive scenic backdrop to the municipality. This area contains large areas of significant CBAs and most of the formal and informal conservation areas in the Beaufort West Municipality.
- The Gamka River basin which contains the settlements of Beaufort West and Merweville. This area is used for extensive small stock farming.
- The Sout River Basin to the south-east of Beaufort West which is a large area of significantly degraded land with extremely low stock carrying capacity and low concentrations of people. The proposed project is located in the South River Basin area.
- The area to the west of Murraysburg which forms an almost separate eco and social system. It is the highest, wettest, and most fertile part of the municipality where most of the small areas of intensive farming are found, particularly in the west. In the south the landscape rises up to the Sneeuberg. It is 91kms from Graaff Reinet in the Eastern Cape and 158kms from Beaufort West. This remote location creates a significant challenge as it depends on services delivered from Beaufort West.

Section 5.2.1 of the SDF lists four bioregions that can be distinguished in terms of the natural environment and economy.

The bio- regions are:

- Nuweveld Highlands.
- Gamka River Basin.
- Sout River Badlands.
- Sneeuwberg Foothills.

The project is located in the Sout River Badlands, which corresponds to the Sout River Basin area.

The Sout River bioregion has “fairly good solar and wind” potential. The carrying capacity of the area is low, and the landscape is described as “flat, desert like cosmic plain inkling to the south”. The largest town in the region is Nelspoort, which used to be located on the N1 when it followed the rail line but this section has now been bypassed. This has left the village isolated.

Section 5.2.1, Natural Systems Synthesis, notes that the Annual Horizontal Solar Radiation is fairly high – 2000 – 2100 KWh/m2, increasing towards the north. Similarly, wind speeds of 6 – 8m/s are also fairly high. The section notes that both these sources could be potential energy generators.

Section 5.4.1.6, Wind and Solar Farm Siting Principles, lists a set of siting principles that are proposed to be used as a first set of questions to guide potential developers of wind and solar farms. The focus is largely on wind farms. However, the following are also relevant to solar farms:

- Slopes by gradient classes.
- Rocky areas.
- Soil type and permeability.
- Natural watercourses and areas with high water table, Rainfall data.
- Vegetation types and sensitivity.
- Road layout and design – slopes to be considered in road layout to reduce erosion potential of road run-off, rock-fall and landslide potential.

- Re-vegetation – steep road verges and cuts require re-vegetation to reduce sedimentation from run-off.
- Soil types and potential for erosion.
- Soil types influence on road construction and re-vegetation.
- Surface Hydrology and Groundwater. Design of roads and treatment of runoff from roads and disturbed surfaces to reduce sedimentation and eliminate erosion.

As indicated above, the proposed project is located within the Sout River bioregion The carrying capacity of the area is low, and the landscape is described as “flat, desert like cosmic plain inkling to the south”. The area appears to be well suited for the establishment of PV facilities.

3.4 GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS

This section includes relevant Guidelines, Policies and Authoritative reports applicable to the proposed Bulskop PV.

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

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

The NPAES identifies 42 focus areas for land-based protected area expansion in South Africa. These are large intact and un-fragmented areas suitable for the creation or expansion of large, protected areas. Farm 423 (i.e., the study Site) is situated directly south and west of the Steenbokkie Private Nature Reserve (it must be noted that the projects within the Bulskop Cluster that border the Steenbokkie Nature Reserve have a setback line of 100m from the boundary of the Nature Reserve.

The closest focus area is the Upper Karoo Focus Area situated approximately 18kms NNE from the Study Site. The proposed Bulskop PV will not affect this or any other NPAES focus area as it is situated considerable distance from the Upper Karoo Focus Area.

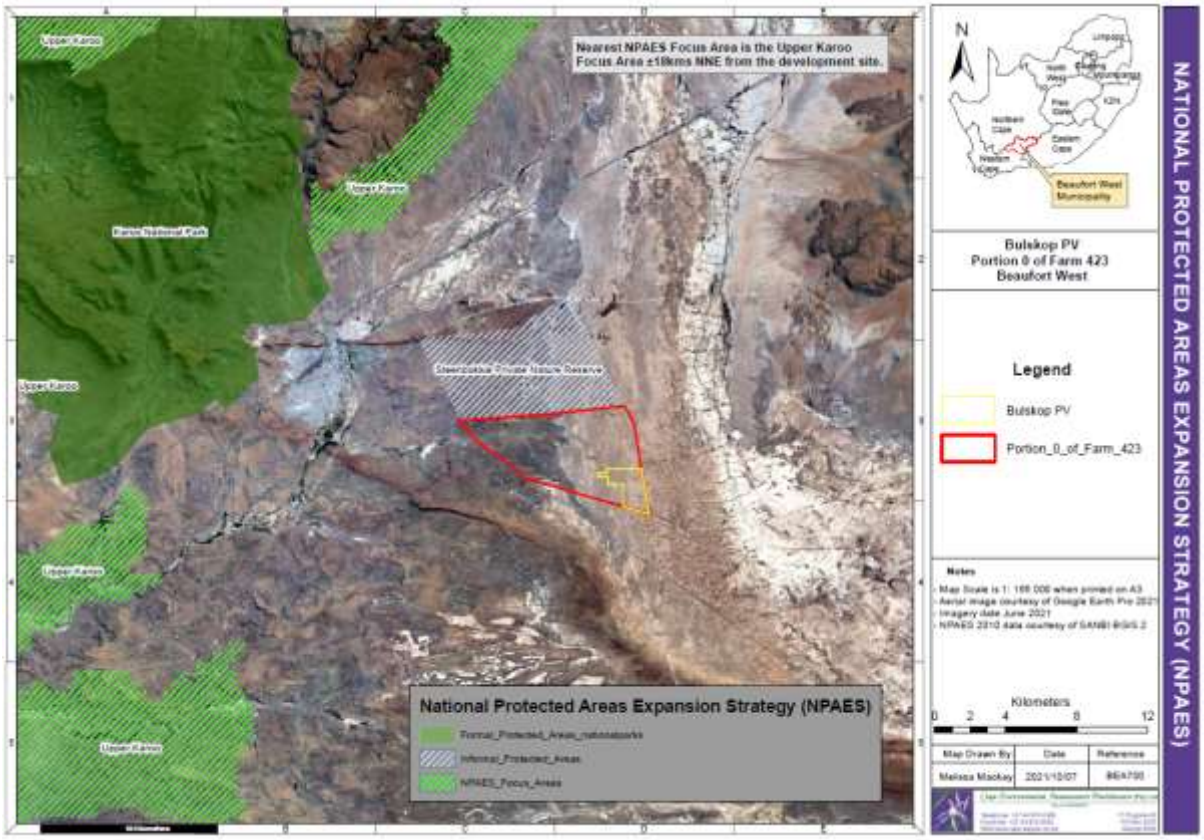


Figure 32: Bulskop PV in relation to the NPAES Expansion Areas.

3.4.2 Western Cape Biodiversity Sector Plan (2017)

A Critical Biodiversity Areas (CBA) Map is a spatial plan for ecological sustainability. It identifies a set of biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

The Western Cape Biodiversity Sector Plan gives legal status to the CBA Map through the National Environmental Management: Biodiversity Act (Act 10 of 2004),

The Western Cape Biodiversity Spatial Plan classifies areas into Critical Biodiversity Areas (CBA1), Degraded Critical Biodiversity Areas (CBA2), Ecological Support Areas (ESA1 &ESA2), Other Natural Areas (ONA) and Protected Areas (PA). The figure below shows that the Bulskop PV overlaps with areas classified as:

- CBA1;
- CBA2 degraded; and
- ONA.

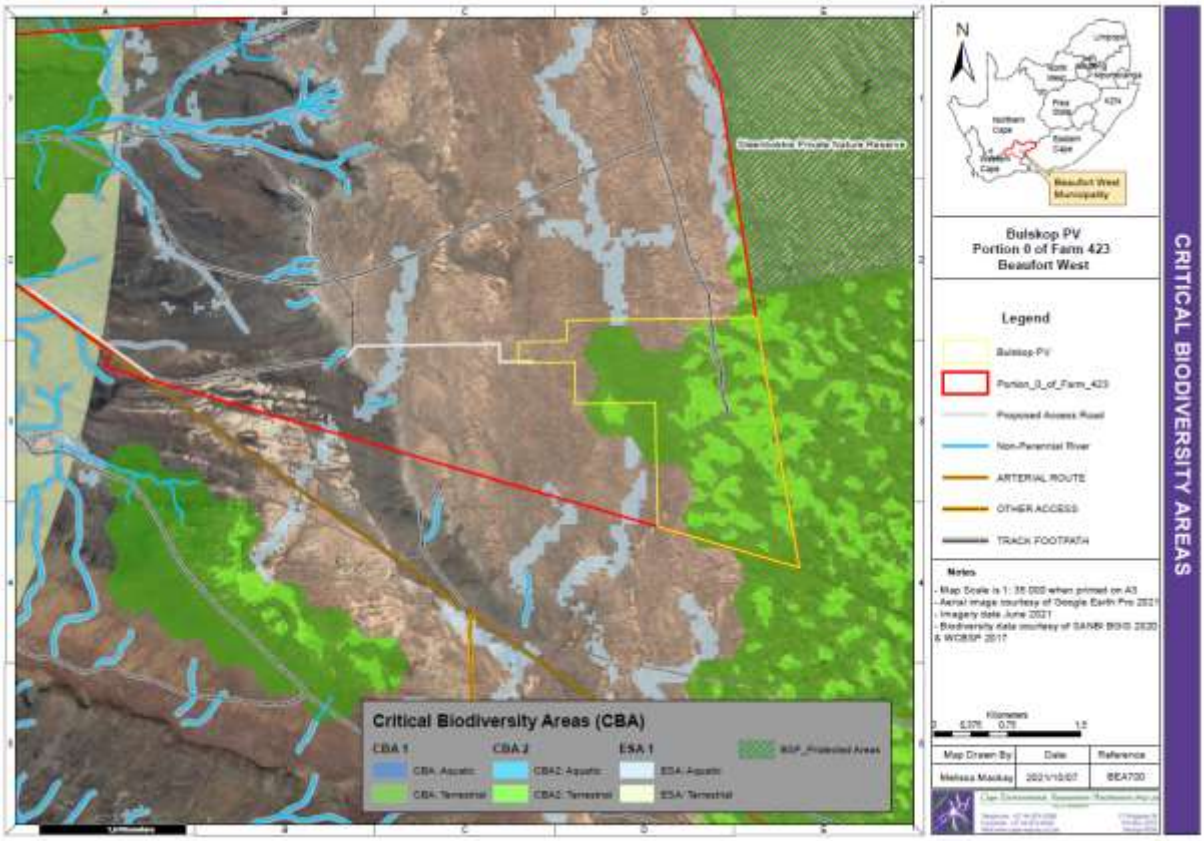


Figure 33: Bulskop PV in relation to Critical Biodiversity Areas.

The Ecological Specialist (Annexure E1) has confirmed that the area designated as a CBA1 and 2 is in a modified state, with medium functional integrity. The designated CBA areas are not in a natural nor near natural state and as such development activities can be considered favourably for development subject to the implementation of the Mitigation Measures.

3.4.3 White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)

The White Paper on Renewable Energy Policy of 2003 supplements Government's predominant policy on energy as set out in the White Paper on the Energy Policy of the Republic of South Africa (DME, 1998). The policy recognises the potential of Renewable Energy and aims to create the necessary conditions for the development and commercial implementation of Renewable Energy technologies. The position of the White Paper on Renewable Policy is based on the integrated resource planning criterion of:

"Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options."

The White Paper on Renewable Energy Policy sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing Renewable Energy in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and fairly accessible and affordable coal resources. However, massive Renewable Energy resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. The White Paper on Renewable Energy Policy fosters the uptake of Renewable Energy in the economy and has a number of objectives that include: ensuring equitable resources are invested in renewable technologies; directing public resources for implementation of Renewable Energy technologies; introducing suitable fiscal incentives for Renewable Energy and; creating an investment climate for the development of the Renewable Energy sector.

The White Paper on Renewable Energy Policy set a target of 10 000GWh to be generated from Renewable Energy by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the Renewable Energy summit of 2009. The objectives of the White Paper on Renewable Energy Policy are considered in six focal areas, namely; financial instruments, legal instruments, technology development, awareness raising, capacity building and education, and market based and regulatory instruments. The policy supports the investment in Renewable Energy facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of Renewable Energy sources.

3.4.4 White Paper on the Energy Policy of the Republic of South Africa (1998)

The White Paper on Energy Policy places emphasis on the expansion of energy supply options to enhance South Africa's energy security. This can be achieved through increased use of renewable energy and encouraging new entries into the generation market. South Africa has an attractive range of cost-effective renewable resources, taking into consideration social and environmental costs. Government policy on renewable energy is thus concerned with meeting the following challenges:

- Ensuring that economically feasible technologies and applications are implemented.
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options.
- Addressing constraints on the development of the renewable industry.

The policy states that the advantages of Renewable Energy include; minimal environmental impacts during operation in comparison with traditional supply technologies, generally lower running costs, and high labour intensities. Disadvantages include; higher capital costs in some cases; lower energy densities; and lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. Nonetheless, renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future. The White Paper on Energy Policy therefore supports the advancement of Renewable Energy sources and ensuring energy security through the diversification of supply.

3.4.5 Integrated Energy Plan, 2016

The development of a National Integrated Energy Plan was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan in the Government Gazette. The purpose of the Integrated Energy Plan is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development.

The Integrated Energy Plan notes that South Africa needs to grow its energy supply to support economi**c expansion and** in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives were identified, namely:

- Objective 1: Ensure security of supply;
- Objective 2: Minimise the cost of energy;
- Objective 3: Promote the creation of jobs and localisation;
- Objective 4: Minimise negative environmental impacts from the energy sector;
- Objective 5: Promote the conservation of water;
- Objective 6: Diversify supply sources and primary sources of energy;
- Objective 7: Promote energy efficiency in the economy; and
- Objective 8: Increase access to modern energy.

The Integrated Energy Plan provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and also take into account the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others.

Based on this information the Integrated Energy Plan then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The Integrated Energy Plan is therefore focused on determining the long-term energy pathway for South Africa, taking into account a multitude of factors which are embedded in the eight objectives.

As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios:

- The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term;
- The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy;
- The Resource Constrained Scenario in which global energy commodity prices (i.e., coal, crude oil and natural gas) are high due to limited supply;
- The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan, are met.

The Integrated Energy Plan notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of renewable energy, the document refers to wind and solar energy. The document does however appear to support solar over wind noting that solar PV and CSP with storage present excellent opportunities to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Solar technologies also present the greatest potential for job creation and localisation. Incentive programmes and special focused programmes to promote further development in the technology, as well as solar roll-out programmes should be pursued.

3.4.6 Integrated Resource Plan for Electricity (2010-2030)

The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the Integrated Energy Plan and constitutes South Africa's national electricity plan. The primary objective of the IRP is to determine the long-term electricity demand and detail how this demand should be met in terms of generating capacity, type, timing and cost. The IRP also serves as input to other planning functions, including amongst others, economic development and funding, and environmental and social policy formulation.

The current iteration of the IRP, led to the Revised Balanced Scenario (RBS) that was published in October 2010. Following a round of public participation which was conducted in November / December 2010, several changes were made to the IRP model assumptions. The document outlines the proposed generation new-build fleet for South Africa for the period 2010 to 2030. This scenario was derived based on a cost-optimal solution for new-build options (considering the direct costs of new build power plants), which was then "balanced" in accordance with qualitative measures such as local job creation.

The Policy-Adjusted IRP reflects recent developments with respect to prices for renewables. In addition to all existing and committed power plants, the plan includes 9.6GW of nuclear; 6.25GW of coal; 17.8GW of renewables; and approximately 8.9GW of other generation sources such as hydro, and gas.

3.4.7 National Development Plan 2030 (2012)

The National Development Plan 2030 is a plan prepared by the National Planning Commission in consultation with the South African public which is aimed at eliminating poverty and reducing inequality by 2030. The National Development Plan aims to achieve this by drawing on the energies of its people, growing and inclusive economy, building capabilities, enhancing the capacity of the state and promoting leaderships and partnerships throughout society. While the achievement of the objectives of the National Development Plan requires progress on a broad front, three priorities stand out, namely:

- Raising employment through faster economic growth.
- Improving the quality of education, skills development and innovation.
- Building the capability of the state to play a developmental, transformative role.

In terms of the Energy Sectors role in empowering South Africa, the National Development Plan envisages that, by 2030, South Africa will have an energy sector that promotes:

- Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.
- Social equity through expanded access to energy at affordable tariffs and through targeted, sustainable subsidies for needy households.
- Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.

The National Development Plan aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The proposed project will assist in reducing carbon emissions targets and creating jobs in the local area as well as assist in creating a competitive infrastructure based on terms of energy contribution to the national grid.

3.4.8 The New Growth Path Framework

The aim of the New Economic Growth Path Framework is to enhance growth, employment creation and equity. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water and housing.

The New Growth Path also identifies five other priority areas as part of the programme, through a series of partnerships between the State and the private sector. The Green Economy as one of the five priority areas to create jobs, including expansions in construction and the production of technologies for solar, wind and biofuels. In this regard clean manufacturing and environmental services are projected to create 300 000 jobs over the next decade.

3.4.9 National Infrastructure Plan

The South African Government adopted a National Infrastructure Plan in 2012. The aim of the plan is to transform the economic landscape while simultaneously creating significant numbers of new jobs and strengthen the delivery of basic services. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.

As part of the National Infrastructure Plan, Cabinet established the Presidential Infrastructure Coordinating Committee (PICC). The Committee identified and developed 18 strategic integrated projects (SIPS). The SIPs cover social and economic infrastructure across all nine provinces (with an emphasis on lagging regions) and consist of:

- Five geographically focussed SIPs;
- Three spatial SIPs;
- Three energy SIPs;
- Three social infrastructure SIPs;
- Two knowledge SIPs;
- One regional integration SIP;
- One water and sanitation SIP.

The three energy SIPS that are related to Bulskop PV are SIP 8, 9 and 10.

Table 10: Strategic Infrastructure applicable to Bulskop PV

SIP 8: Green energy in support of the South African economy
Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010); Support bio-fuel production facilities.
SIP 9: Electricity generation to support socio-economic development
Accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances; Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula.
SIP 10: Electricity transmission and distribution for all
Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.

Although this project aligns with these 3 SIP's, it will only receive formal SIP status once it is selected as a preferred bidder under the REIPPPP.

3.4.10 Strategic Environmental Assessment (SEA) for Wind and Solar PV energy in South Africa

The Strategic Environmental Assessment (SEA) for wind and solar PV energy in South Africa (CSIR, 2013) identified eight (8) Renewable Development Zones (REDZs). The REDZs identified areas where large scale renewable energy facilities can be developed in in a manner that limits significant negative impacts on the environment while yielding the highest possible socio-economic benefits to the country.

The Phase 2 SEA identified a further 3 REDZ, which were formally gazetted in 2021. The Bulskop PV site is located within the Beaufort West REDZ, which was formally gazetted as part of the Phase 2 REDZ in 2021. The area has therefore been identified as suitable for the establishment of renewable energy facilities, specifically large-scale solar farms.

3.4.11 Conservation of Migratory Species of Wild Animals

Conservation of Migratory Species of Wild Animals (also known as CMS or the Bonn Convention) is an intergovernmental treaty and is the most appropriate instrument to deal with the conservation of terrestrial, aquatic and avian migratory species. The convention includes policy and guidelines with regards to the impact associated with man-made infrastructure. CMS requires that parties (South Africa is a signatory) take measures to avoid migratory species from becoming endangered (Art II, par. 1 and 2) and to make every effort to prevent the adverse effects of activities and obstacles that seriously impede or prevent the migration of migratory species i.e., power lines (Art 111, par. 4b and 4c).

An Avifaunal Specialist has been appointed to consider the impact of the proposed Bulskop PV as well as the powerline connecting the facility to the Eskom Droerivier MTS[30] (Annexure E2). Birdlife Africa South Africa has also been given an opportunity to comment in this regard.

3.4.12 The Agreement on the Convention of African-Eurasian Migratory Water Birds

The Agreement on the Conservation of African-Eurasian Migratory Water birds (AEWA) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitat across Africa, Europe, the Middle East Central Asia, Greenland and the Canadian Archipelago. The AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual cycle and is a legally binding agreement by all contracting parties (South Africa included) to guarantee the conservation of migratory waterbirds within their national boundaries through species and habitat protection and the management of human activities. As mentioned above, an Avifaunal Specialist has been appointed to consider the impact of the proposed Bulskop PV as well as the powerline connecting the facility to the Eskom Droerivier MTS[31] (Annexure E2). Birdlife Africa South Africa has also been given an opportunity to comment in this regard.

3.4.13 Guidelines to minimise the impacts on birds of Solar Facilities and Associated Infrastructure in South Africa

The "Guidelines to minimise the impact on birds of Solar Facilities and Associated Infrastructure in South Africa" (Smit, 2012) is perhaps the most important (although not legally binding) document from an avifaunal impact perspective currently applicable to solar development in South Africa. The guidelines are published by BirdLife South Africa (BLSA) and detail the recommended procedure for conducting an avifaunal specialist study as well as list all of the potential impacts of interactions between birds and solar facilities and associated infrastructure. We are aware of changes to the BLSA best-practise guidelines recently published at the Birds and Renewable Energy Forum in Johannesburg (2015) and although the revised requirements are still a work in progress and have not yet been ratified, they will inform this assessment where applicable. Please refer to Annexure E1 for a copy of the Avifaunal assessment undertaken for this project.

3.4.14 Environmental Impact Assessment Guideline for Renewable Energy Projects

The Minister of Environmental Affairs published the Environmental Impact Assessment Guideline for Renewable Energy in terms of section 24J of the National Environmental Management Act, 1998 (Act No. 107 of 1998) on 16 October 2016.

In pursuit of promoting the country's Renewable Energy development imperatives, the Government has been actively encouraging the role of Independent Power Producers (IPPs) to feed into the national grid. Through its REIPPPP, the DoE has been engaging with the sector in order to strengthen the role of IPPs in renewable energy development. Launched during 2011, the REIPPPP is designed so as to contribute towards a target of 3 725 MW, and towards socio-economic and environmentally sustainable development, as well as to further stimulate the renewable industry in South Africa.

In order to facilitate the development of the first phase of IPPs in South Africa, these guidelines have been written to assist project planning, financing, permitting, and implementation for both developers and regulators. The guideline is principally intended for use by the following stakeholder groups:

- Public Sector Authorities (as regulator and/or competent authority);
- Joint public sector authorities and project funders, e.g., Eskom, IDC, etc.

[30] The powerline to the MTS is being assessed as part of as separate basic assessment process.

[31] The powerline is being assessed as part of a separate Basic Assessment Process

- Private Sector Entities (as project funder/developer/consultant);
- Other interested and affected parties (as determined by the project location and/or scope).

This guideline aims to ensure that all potential environmental issues pertaining to renewable energy projects are adequately and timeously assessed and addressed as necessary so as to ensure sustainable roll-out of these technologies by creating a better understanding of the environmental approval process for renewable energy projects.

The guidelines list the following possible environmental impacts associated with the development of solar energy facilities.

Table 11: Potential environmental impacts of solar energy projects (Adapted from DEA, 2015) showing where they have been considered in this report

Impact Description	Relevant Legislation	Applicability to this project
Visual Impact	NEMA	Specialist input attached in Annexure E8.
Noise Impact (CSP)	NEMA	Not applicable, as CSP is not considered as a technology alternative.
Land Use Transformation (fuel growth and production)	NEMA, NEMPAA, NHRA	Not Applicable to PV. Agricultural specialist input however attached in Annexure E3
Impacts on Cultural Heritage	NEMA, NHRA	Heritage impact assessment attached in Annexure E4, E5, E6 and E7.
Impacts on Biodiversity	NEMA, NEMBA, NEMPAA, NFA	Biodiversity specialist input attached in Annexure E1 and E2 (Terrestrial Biodiversity and Aquatic Biodiversity)
Impacts on Water Resources	NEMA, NEMICMA, NWA, WSA	The project will obtain water directly from the local municipality. A freshwater ecologist has assessed the potential impacts on freshwater resources (Annexure E1) which are limited to a single crossing of a watercourse by the main access road.
Hazardous Waste Generation (CSP and PV)	NEMA, NEMWA, HAS	The EMPr makes provision for damaged and defunct PV infrastructure for dismantling and re-use.
Electromagnetic Interference	NEMA	The nearest SKA station has been identified as SKA 133, at approximately 150 km from the proposed Bulskop PV. SKA have been given an opportunity to provide comment in this regard.
Aircraft Interference	NEMA, MSA	The SA CAA have been automatically registered as an interested and affected party on this environmental process. There are no airports nor landing strips in the vicinity of the proposed site.

Impact Description	Relevant Legislation	Applicability to this project
Loss of Agricultural Land	SALA	Agricultural specialist input is attached in Annexure E3
Sterilisation of mineral resources	MPRDA	The Department of Mineral Resources has been registered as an I&AP on this environmental process.

Assuming an IPP project triggers the need for BA or S&EIR under the EIA regulations (which in this case is a Basic Assessment), included in the assessment process is the preparation of an environmental management programme (EMPr). Project-specific measures designed to mitigate negative impacts and enhance positive impacts should be informed by good industry practice and are to be included in the EMPr. Potential mitigation measures for solar energy projects include but are not limited to:

- Conduct pre-disturbance surveys as appropriate to assess the presence of sensitive areas, fauna, flora and sensitive habitats;
- Plan visual impact reduction measures such as natural (vegetation and topography) and engineered (berms, fences, and shades, etc.) screens and buffers;
- Utilise existing roads and servitudes as much as possible to minimise project footprint;
- Site projects to avoid construction too near pristine natural areas and communities;
- Locate developments away from important habitat for faunal species, particularly species which are threatened or have restricted ranges, and are collision-prone or vulnerable to disturbance, displacement and/or habitat loss;
- Fence sites as appropriate to ensure safe restricted access;
- Ensure dust abatement measures are in place during and post construction;
- Develop and implement a storm water management plan;
- Develop and implement waste management plan; and
- Re-vegetation with appropriate indigenous species to prevent dust and erosion, as well as establishment of alien species.

The recommendations of these guidelines have been explicitly considered in this scoping process and where necessary, additional specialist input has been obtained. Please see section 6 of this BAR for a full assessment of impacts.

3.4.15 Sustainability Imperative

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

"Man-land relationships require a holistic perspective, an ability to appreciate the many aspects that make up the real problems. Sustainable planning has to confront the physical, social, environmental and economic challenges and conflicting aspirations of local communities. The imperative of sustainable planning translates into notions of striking a balance between the many competing interests in the

ecological, economic and social fields in a planned manner. The 'triple bottom line' objectives of sustainable planning and development should be understood in terms of economic efficiency (employment and economic growth), social equity (human needs) and ecological integrity (ecological capital)."

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

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

In terms of NEMA sustainable development requires the integration of the relevant factors, the purpose of which is *to ensure that development serves present and future generations.*[32]

It is believed that the proposed 120MW Bulskop PV supports the notion of sustainable development by presenting a reasonable and feasible alternative to the existing vacant land use type, which has limited agricultural potential due the lack of water and infrastructure.

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

3.4.16 National Freshwater Ecosystem Priority Area Status

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa's scarce water resources. This database guides how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998). This directly applies to the National Water Act, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel *et al*., 2011). The NFEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's biodiversity goals (NEM:BA) (Act 10 of 2004), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel *et al.,* 2011). No FEPA rivers nor wetlands are within the PV Development Footprint. The main access road to the facility does however cross a non-perineal river.

32 Refer to definition of "sustainable development" in section 1 of NEMA.

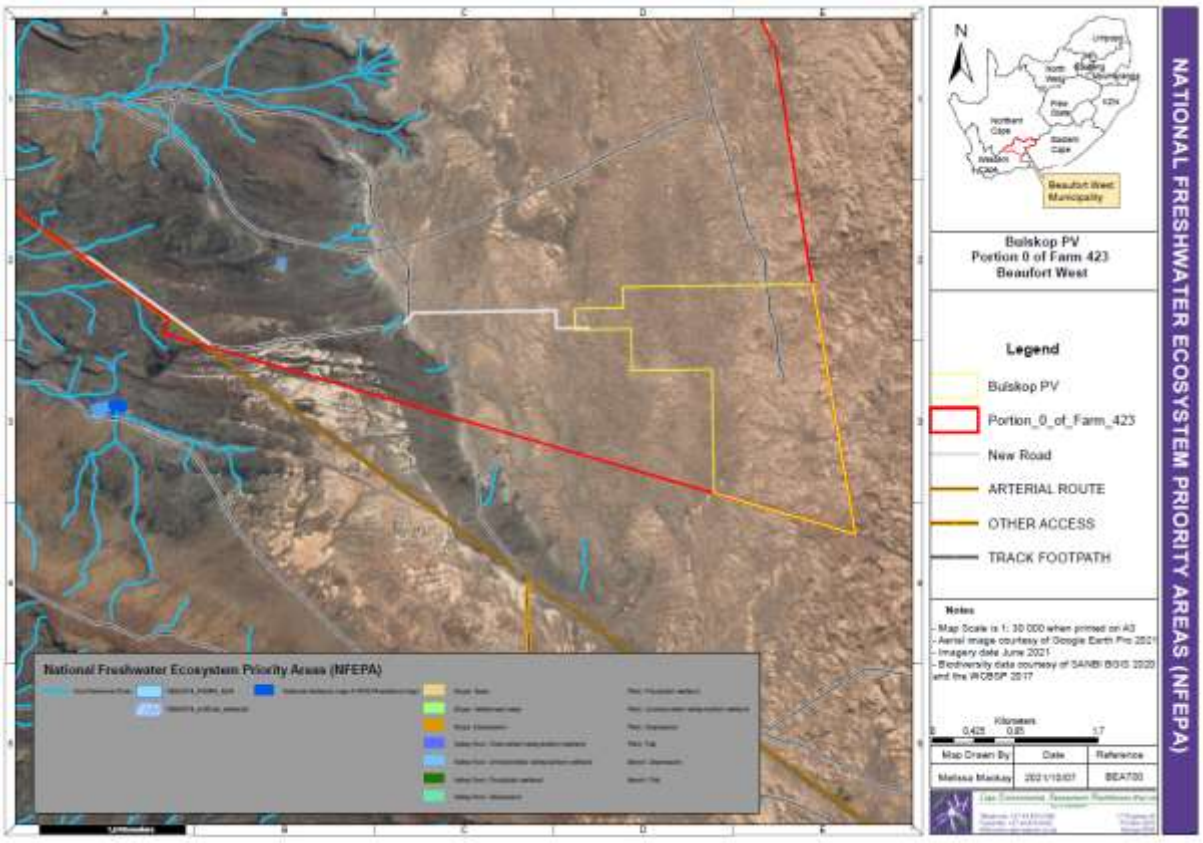


Figure 34: Bulskop PV in relation to the National Freshwater Ecosystem Priority Areas.

3.4.17 DFFE Screening Tool and Protocols

A screening tool report was generated for the proposed Bulskop PV and is attached in Appendix I. The outcomes of the various environmental theme's sensitivity as well as the level of study required by the protocols, are summarised in the table below.

Table 12: Sensitivity of the environmental themes and studies to be undertake in terms of these sensitivities.

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
Agriculture Theme	High	Agricultural Impact Assessment	An Agricultural Impact Assessment has been undertaken and is attached in Annexure E3
Animal Species Theme	High	Animal Species impact assessment.	This forms part of the Terrestrial Biodiversity Impact Assessment attached in Annexure E1.
Aquatic Biodiversity Theme	Low	Aquatic compliance statement.	This forms part of the Terrestrial Biodiversity Impact Assessment attached in Annexure E1.
Archaeological and Cultural Heritage Theme	Low	Heritage Compliance Statement.	Notwithstanding the low theme sensitivity, a Heritage Impact Assessment has been undertaken and is attached in Annexure E4.
Civil Aviation (Solar PV) Theme	Low	Compliance Statement	The South African Civil Aviation Authority will be provided an opportunity to comment in this regard.

Environmental Theme	Sensitivity	Required investigation	Discussion / Compliance
Landscape (Solar) Theme	Very High	Visual and Landscape Impact Assessment	A Visual Impact Assessment has been undertaken and is attached in appendix E8.
Plant Species Theme	Medium	Compliance Statement	This forms part of the Terrestrial Biodiversity Impact Assessment attached in Annexure E1.
RFI Theme	Low	Compliance Statement	The South African Square Kilometre Array SKA-SA and SARAO will be requested to provide professional comment in this regard.
Terrestrial Biodiversity Theme	Very High	Terrestrial Biodiversity Impact Assessment	The terrestrial biodiversity assessment is attached in annexure E1.

The table below reflects the specialist studies recommended in the DEA Screening tool and whether they will be included in the Draft EIR.

Table 13: Specialist Studies recommended in the DEA Screening Tool.

Study Recommended	Discussion
Agricultural Impact Assessment	Has been undertaken. See Annexure E3 of this BAR
Landscape/Visual Impact Assessment	Has been undertaken. See Annexure E8 of this BAR
Archaeological and Cultural Heritage Impact Assessment	Has been undertaken. See Annexures E4, E5 and E6. of this BAR
Palaeontology Impact Assessment	Has been undertaken. See Annexure E7 of this BAR
Terrestrial Biodiversity Impact Assessment	Has been undertaken. See Annexure E1 of this BAR
Aquatic Biodiversity Impact Assessment	Has been undertaken. See Annexure E1 of this BAR
Avian Impact Assessment	Has been undertaken. See Annexure E2 of this BAR
Civil Aviation Assessment	Has not been undertaken – The closest airstrip was identified as the Karoo Gateway Airport situated approximately 10 km to the North of the Site. The South Avian Civil Aviation Authority and the Karoo Gateway Airport will be given an opportunity to comment on this Basic Assessment Process. The applicant has submitted an obstacle application (Part 30-27) to the South African Civil Aviation Authority.
Defence Assessment	Has Not been undertaken – the South African National Defence Force will be provided with an opportunity to comment on this Basic Assessment Process.
RFI Assessment	Has not been undertaken – The Bulskop PV facility is not within the Geographic Advantage Area, as it is situated outside of the Northern Cape. It was furthermore found to be situated more than 150km from the closest SKA station (SKA133). The South African SKA Project Office and the South African Radio Astronomy Observatory (SARAO) have been registered as a key stakeholder on this environmental process and have been requested to provide input in terms of the Astronomy Geographic Advantage Act and potential impact to SKA.

Geotechnical Assessment	Has not been undertaken – The Council for Geoscience will be approached for comment in this regard.
Socio-Economic Assessment	Has been undertaken. See Annexure E9 of this BAR
Plant Species Assessment	Has been undertaken. See Annexure E1 of this BAR
Animal Species Assessment	Has been undertaken. See Annexure E1 of this BAR

4. PLANNING CONTEXT

Please refer to the planning statement compiled by Townscape Planning Solutions attached in Appendix E15.

The land use planning process involves the following:

- Application for consent use in terms of the Spatial Planning and Land Use Management Act, Act 16 of 2013, submitted to the Beaufort West Local Municipality, in terms of the Beaufort West Municipal Standard Zoning Scheme By-law, 2020.

In terms of the Beaufort West Municipal Standard Zoning Scheme By-law, 2020 a renewable energy structure is permitted as a consent use of Agricultural 1 Zoned land. The following figure provides an extract from the Beaufort West Municipal Standard Zoning Scheme By-law, 2020 indicating the consent uses of Agricultural 1 Zoned land.

1	2	3
Zoning	**Primary use**	**Consent use**
AGRICULTURAL ZONES		
Agricultural Zone I (AZI)		
The objective of this zone is to promote and protect agriculture on farms as an important economic, environmental and cultural resource. Limited provision is made for non-agricultural uses to provide rural communities in more remote areas with the opportunity to increase the economic potential of their properties, provided these uses do not present a significant negative impact on the primary agricultural resource.	**Primary use** • Agriculture	**Consent uses** • Abattoir • Additional dwelling units • Agricultural industry (>2000m²) • Airfield • Animal care centre • Aqua-culture • Camping site • Farm shop • Farm grave yard • Freestanding base telecommunication station • Function venue • Guest house • Helicopter landing pad • Off-road trail • Plant nursery • Quarry • Renewable energy structure • Shooting range • Tourist facilities • Utility service

The following planning statement outlines the details of the planning process, as well as the responsibilities of the land use planning specialist, specifically pertaining to the projects envisioned on the abovementioned property:

- The property is located within the Beaufort West Local Municipality and any process of land use change will be subject to the Scheme Regulations and Municipal Planning By-laws of the said Municipality.
- The property is currently zoned as Agricultural Zone 1 in terms of Beaufort West Municipal Standard Zoning Scheme By-law, 2020. In order to allow for the development of a Renewable Energy Facility thereon, application for a consent use on the applicable portion of the property will have to be launched.
- The application for consent use will be compiled and submitted in terms of the Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA), as well as the Beaufort West Local Municipal Standard Zoning Scheme By-law, 2020.
- SPLUMA retracts the Removal of Restrictions Act, Act 84 of 1967, and any title deed restrictions on the property may be removed at the discretion of the local authority in terms of SPLUMA.

Additional to attaining the land use rights at the Local Authority, Townscape Planning Solutions as town planning firm also provides the service of applying for a long-term lease at the Department of Agriculture Forestry and Fisheries (DAFF). It must be critically stated that these processes cannot run in parallel anymore, since DAFF will only consider a long-term lease application after it has granted a no-objection letter to the consent use, as well as the consent use approval, has been received.

The town planning process may therefore be summarized in the following table:

Task	Detail	Outcome
1	Pre application information gathering (Application requirements)	All the documentation is available and signed off by client and other professionals.
2	Compilation of applications	Application ready for submission
3	Submission of applications	Beaufort West Municipality confirms that a complete and compliant application has been submitted
4	Statutory requirements of the applications	Successful in complying with all requirements in terms of Section 11 of the Beaufort West Municipal Standard Zoning By-law, 2020.
5	Follow the application through Beaufort West Municipality	To ensure that all relevant departments commended on application.
6	Approval application	That positive approvals are granted
7	Complying to conditions in approval document	To ensure that the client knows of any limitations on the Conditions of Approval (PCP) and extent of timeframes allowed to proclaim the amendment scheme.

5. SITE DESCRIPTION AND ATTRIBUTES

The following sections provide a description of the natural environment, built environment and social and economic context of Portion 0 of the farm 423, with particular focus on the site location for the proposed Bulskop PV.

5.1 LOCATION & BUILT ENVIRONMENT

The target property, Portion 0 of the Farm 426, is located in the Central Karoo District of the Western Cape Province, within the jurisdiction area of the Beaufort West Local Municipality. The property is approximately 2667.0374 hectares in size and is located approximately Southeast of Beaufort West.

The proposed Bulskop PV is accessed from the R61 between Beaufort West and Aberdeen.

According to the heritage specialist, no buildings, ruins or any other structures were noted on or within the direct proximity of the proposed Bulskop PV site[33].

5.2 GEOLOGY & CLIMATE

According to the palaeontology specialist, Dr John Almond (Annexure E7), the PV facility and grid connection is underlain at depth or at surface by Permian continental sediments of the Teekloof Formation (Lower Beaufort Group / Adelaide Subgroup, Karoo Supergroup)

According to the Agricultural Specialist, Johan Lanz (Annexure E3) dominant soils are deep soils of the Oakleaf soil form.

The region is classified as an arid zone moderate climate. Specific parameters are shown in the figures below.

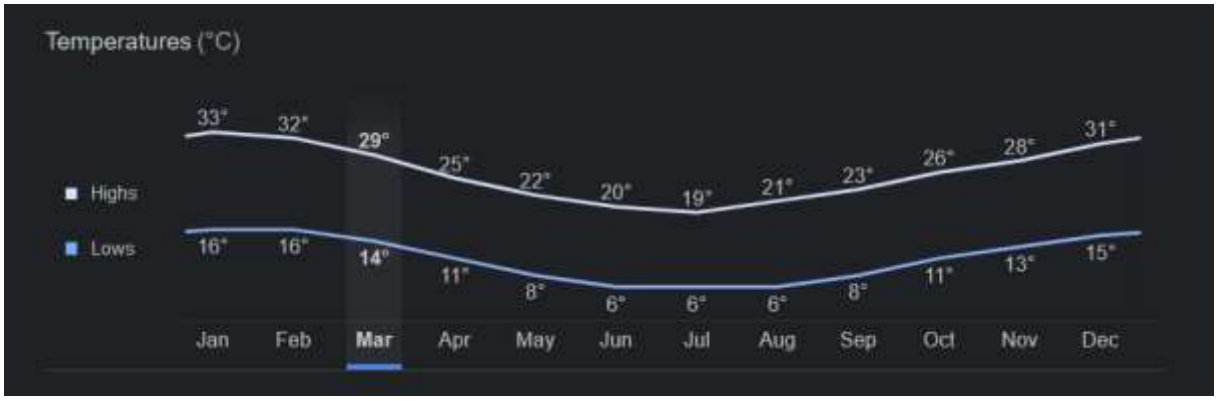


Figure 35: Average monthly minimum and maximum temperatures for the Beaufort West Area.

Figure 36: Average Monthly Rainfall for the Beaufort West Area.

[33] The only significant heritage structures present were situated in close proximity to the proposed Grid connection, which is being assessed as part of a separate environmental process.

5.3 TOPOGRAPHY

According to the Visual Specialist, Mr Stephen Stead (Annexure E8), the terrain is predominantly flat with excluding the escarpment located 15km to the northwest. The North to South Profile ranges from 950mamsl in the north, to 875mamsl in the south, while the East to West Profile ranges from 764mamsl in the West to 890mamsl in the East

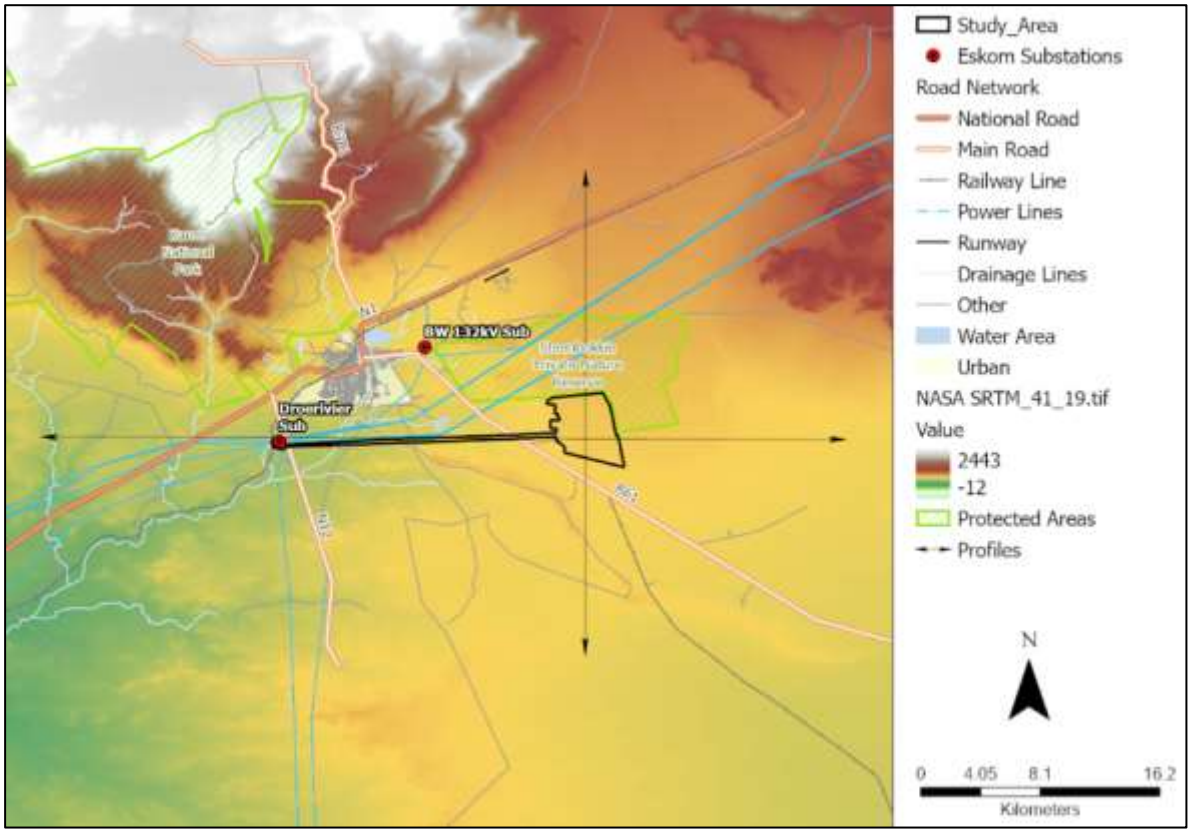


Figure 37: Regional Digital Elevation Model (Stead, 2022)

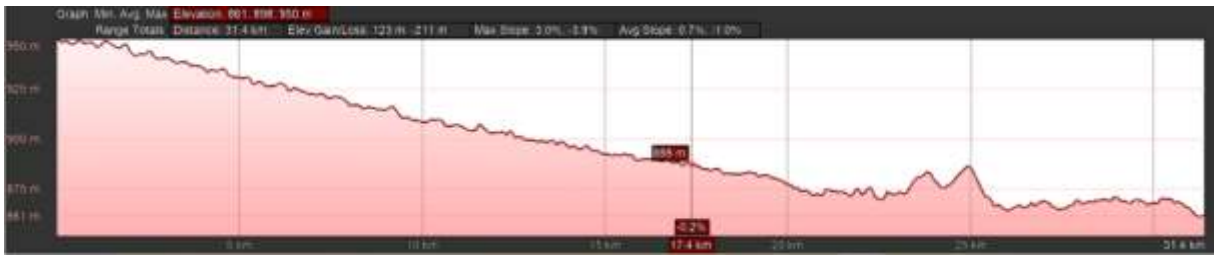


Figure 38: North to South Terrain Profile (Stead, 2022).

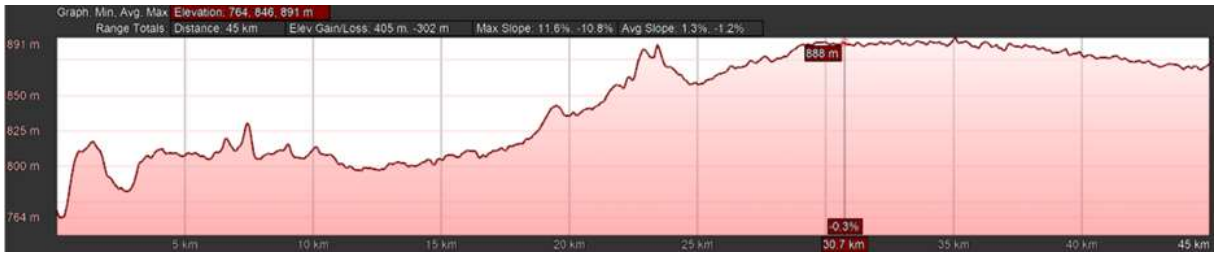


Figure 39: West to East Terrain Profile (Stead, 2022)

5.4 BOTANICAL COMPOSITION OF THE SITE

The Biodiversity Company undertook a Botanical Impact Assessment which formed part of larger Terrestrial Ecosystems Impact Assessment. Please refer to the Terrestrial Ecological Impact Assessment attached in **Annexure E1** from which the following has been drawn.

5.4.1 Broad-Scale Vegetation Patterns

Site is situated in the Gamka Karoo and the Southern Karoo Riviere vegetation types as per the image below.

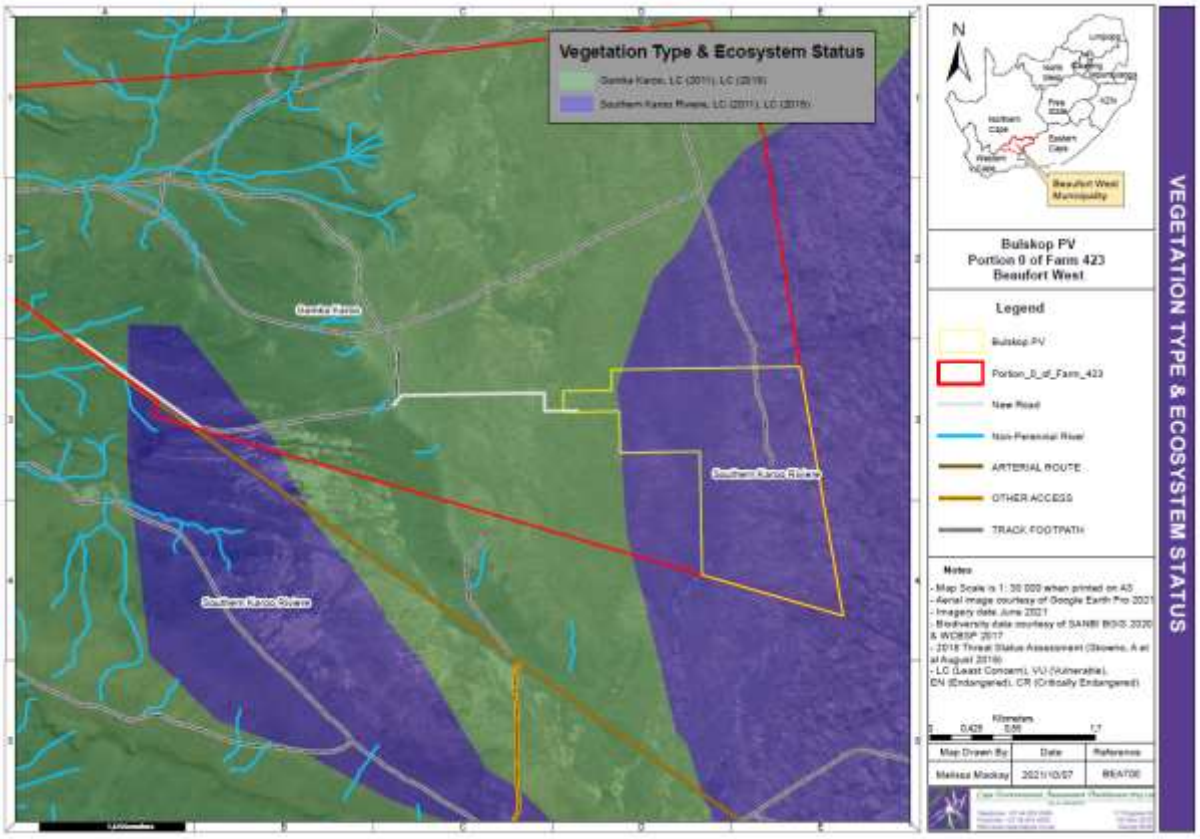


Figure 40: Broad Scale Vegetation Types Associated with Bulskop PV.

5.4.1.1 Gamka Karoo

Gamka Karoo vegetation type is found in the Western Cape, Eastern Cape and marginally in the Northern Cape. This vegetation type occurs on extremely irregular to slightly undulating plains covered with dwarf spiny shrubland dominated by Karoo dwarf shrubs (e.g. *Chrysocoma ciliata*, *Eriocephalus ericoides*) with rare low trees (e.g. *Euclea undulata*). It occurs at an altitude of 500-1100 m.

According to Mucina & Rutherford (2006), this vegetation type is classified as Least Threatened. The national target for conservation protection for both these vegetation types is 16%, with about 2% statutorily conserved in the Karoo National Park and some in private reserves, such as Steenbokkie Private Nature Reserve.

5.4.1.2 Southern Karoo Riviere

The Southern Karoo Riviere vegetation type is found in the Western and Eastern Cape Provinces. This vegetation type occurs along narrow riverine flats supporting a complex of Vachellia karroo or Tamarix usneoides thickets (up to 5 m tall), and fringed by tall Salsola-dominated shrubland (up to 1.5 m high), especially on heavier (and salt-laden) soils on very broad alluvia. (Mucina & Rutherford, 2006).

The Southern Karoo Riviere vegetation type is classified as Least Threatened. The national target for conservation protection for this vegetation types is 24%, but only about 1.5% statutorily conserved in

the Karoo National Park as well as in the Aberdeen, Bosberg, Commando Drift, Gamkapoort and Karoo Nature Reserves and in about 10 private reserves, mainly set up for game farming

5.4.2 Habitats & Plant Communities

The ecological specialist identified two habitat type within the development area namely:

- Southern Karoo Riviere Plains, and
- Southern Karoo Riviere Grassland

The Southern Karoo Riviere Plains type is dominant and only the access route traverses the Southern Karoo Riviere Grassland habitat type.

Southern Karoo Riviere is a delta where the surface wash of the rain events flows in a generally south-western direction, following the main river channel through the rocky/stony substrate and deposits clay material on the alluvial plains. These rocky areas are characteristically darker areas where grasses and small/low shrubs dominate the species composition, these areas are called Southern Karoo Riviere Grassland. As part of these surface wash areas the Southern Karoo Riviere Sandy Plains are encountered to the east of the study area where a sandy substrate dominates. These areas are heavily disturbed from a grazing and trampling perspective but is still regarded as playing a crucial role in lateral water flow.

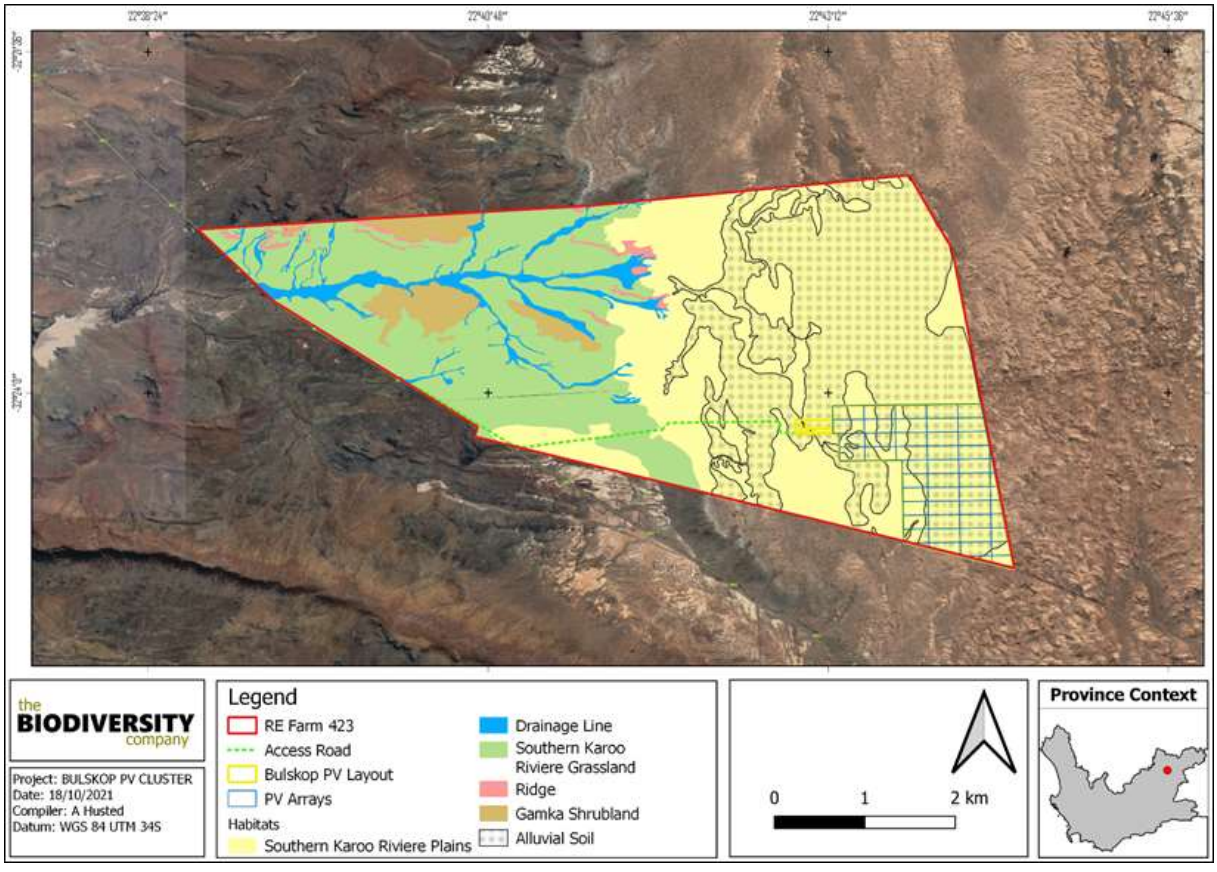


Figure 41: Habitat types within the study site and on the proposed Bulskop PV.

5.4.3 Species of conservation concern.

Based on the Plants of Southern Africa database, 602 plant species have the potential to occur in the study area and its surroundings. Of these 602 plant species, 3 species is listed as being Species of Conservation Concern as per the table below.

Table 14: Plant Species of Conservation Concern with the potential to occur in the study area (The Biodiversity Company, 2022)

Family	Taxon	IUCN	Ecology	Likelihood of occurrence
Aizoaceae	*Drosanthemum calycinum*	Near Threatened	Indigenous; Endemic	Moderate
Bruniaceae	*Audouinia esterhuyseniae*	Vulnerable	Indigenous; Endemic	Moderate
Rosaceae	*Cliffortia arborea*	Vulnerable	Indigenous; Endemic	Moderate

The National Web based Environmental Screening Tool indicated four medium sensitive species for the study area, none of which were recorded by the specialist during the field assessment.

Table 15: National Screening Tool sensitive species

Sensitivity rating	Species Name
Medium	*Ruschia beaufortensis*
Medium	Sensitive species 383
Medium	*Peersia frithii*
Medium	Sensitive species 1212

5.5 TERRESTRIAL FAUNAL COMPONENT OF THE SITE

The Biodiversity Company undertook a Animal Species Assessment which formed part of larger Terrestrial Ecosystems Impact Assessment. Please refer to the Terrestrial Ecological Impact Assessment attached in **Annexure E1** from which the following has been drawn.

5.5.1 Mammals

The IUCN Red List Spatial Data lists 59 mammal species that could be expected to occur within the study area and surrounds.

Of the 59 mammal species, ten (10) are listed as being of conservation concern on a regional or global basis. Two of the species are expected to have a low likelihood of occurrence due to a lack of suitable habitat and the proximity to urban areas and pressures.

Table 16: List of mammal Species of Conservation Concern that may occur in the study area and surrounding landscape as well as their global and regional conservation statuses.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
Aonyx capensis	Cape Clawless Otter	Near Threatened	Near Threatened	Moderate
Bunolagus monticularis	Riverine Rabbit	Critically Endangered	Critically Endangered	Moderate
Felis nigripes	Black-footed Cat	Vulnerable	Vulnerable	Moderate
Graphiurus ocularis	Spectacular Dormouse	Near Threatened	Least Concern	Moderate
Leptailurus serval	Serval	Near Threatened	Least Concern	Low
Panthera pardus	Leopard	Vulnerable	Vulnerable	Low
Parahyaena brunnea	Brown Hyaena	Near Threatened	Near Threatened	Moderate
Parotomys littledalei	Littledale's Whistling Rat	Near Threatened	Least Concern	High
Pelea capreolus	Grey Rhebok	Near Threatened	Near Threatened	Low

Poecilogale albinucha	African Striped Weasel	Near Threatened	Least Concern	High

Of particular importance here is the Critically Endangered Riverine Rabbit. The Terrestrial Biodiversity Specialist has confirmed that the field assessment of the site indicated that there is minimal suitable habitat for the Riverine Rabbit present within the site as the only drainage lines located within Bulskop development footprint are along with main access road, which are gravelly in nature with limited hydrophytic vegetation or silty banks that provide habitat for this species. The EWT Riverine Rabbit records database indicates that there have not been any historical sightings from the site or immediate surrounds. As such, the site is considered low suitability for this species and an impact on this species is not expected to occur within the site development footprint.

5.5.2 Herpetofauna

Based on the IUCN Red List Spatial Data and the ReptileMap database provided by the Animal Demography Unit. 61 reptile species have the potential to occur in the study area. One of the expected species is a species of conservation concern.

Based on the IUCN Red List Spatial Data and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2020) 13 amphibian species have the potential to occur in the study area. No amphibian SCCs are expected to occur in the study area.

Table 17: Reptile SCC expected in the study area

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2017)	
Psammobates tentorius verroxii	Tent Tortoise	Near Threatened	Near Threatened	Confirmed

Psammobates tentorius veroxii (Tent Tortoise) is categorised as near threatened both locally and internationally. This species can be found in low densities in the Karoo and semi-desert areas of South Africa and Namibia. It is threatened because of the pet trade and destruction of its habitat. This species was confirmed in the development area, which can be attributed to the presence of mesembryanthemums plant, which is suitable food sources for this species.

5.6 AVIFAUNAL COMPONENT OF THE STUDY SITE

The Biodiversity Company undertook an Avifaunal Assessment for the proposed Bulskop PV. Please refer to the Avifaunal Impact Assessment attached in **Annexure E2** from which the following has been drawn.

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 236 bird species have the potential to occur in the vicinity of the project area. Of the potential bird species, twenty (20) species are listed as Species of Conservation Concern as per the table below.

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Aquila verreauxii	Eagle, Verreaux's	Vulnerable	Least Concern	High
Ardeotis kori	Bustard, Kori	Near Threatened	Near Threatened	High
Calidris ferruginea	Sandpiper, Curlew	Least Concern	Near Threatened	Low
Ciconia nigra	Stork, Black	Vulnerable	Least Concern	Moderate

Species	Common Name	Conservation Status		Likelihood of occurrence
		Regional (SANBI, 2016)	IUCN (2021)	
Circus maurus	Harrier, Black	Endangered	Endangered	High
Coracias garrulus	Roller, European	Near Threatened	Least Concern	Low
Cursorius rufus	Courser, Burchell's	Vulnerable	Least Concern	High
Eupodotis vigorsii	Korhaan, Karoo	Near Threatened	Least Concern	High
Falco biarmicus	Falcon, Lanner	Vulnerable	Least Concern	High
Glareola nordmanni	Pratincole, Black-winged	Near Threatened	Near Threatened	Low
Grus paradisea	Crane, Blue	Near Threatened	Vulnerable	High
Leptoptilos crumenifer	Stork, Marabou	Near Threatened	Least Concern	Low
Neotis ludwigii	Bustard, Ludwig's	Endangered	Endangered	High
Numenius arquata	Curlew, Eurasian	Near Threatened	Near Threatened	Low
Oxyura maccoa	Duck, Maccoa	Near Threatened	Endangered	Moderate
Phoeniconaias minor	Flamingo, Lesser	Near Threatened	Near Threatened	High
Phoenicopterus roseus	Flamingo, Greater	Near Threatened	Least Concern	High
Polemaetus bellicosus	Eagle, Martial	Endangered	Endangered	High
Sagittarius serpentarius	Secretary bird	Vulnerable	Endangered	High
Spizocorys sclateri	Lark, Sclater's	Near Threatened	Near Threatened	High

Thirty-eight (38) bird species were recorded in the winter survey. Two of the species recorded were Species of Conservation Concern.

Table 18: Species of Conservation Concern observed in the winter survey.

Common Name	Species	Conservation Status	
		Regional (SANBI, 2016)	IUCN (20121)
Eupodotis vigorsii	Korhaan, Karoo	Near Threatened	Least Concern
Neotis ludwigii	Bustard, Ludwig's	Endangered	Endangered

Seventy-one (71) bird species were recorded in the summer survey, after the area received some rainfall. Four of the species recorded in the summer survey were species of conservation concern, a further four species are classified as near-endemic species.

Table 19: Species of conservation concern and near endemic species observed in the summer survey.

Common Name	Scientific Name	Regional (SANBI, 2016)	IUCN (2021)	Endemism in South Africa (E)
Blue Crane	*Grus paradisea*	Near Threatened	Vulnerable	
Karoo Korhaan	*Eupodotis vigorsii*	Near Threatened	Least Concern	
Lanner Falcon	*Falco biarmicus*	Vulnerable	Least Concern	
Sclater's Lark	*Spizocorys sclateri*	Near Threatened	Near Threatened	Near Endemic
Cape Clapper Lark	*Mirafra apiata*	Unlisted	Least Concern	Near Endemic
Karoo Prinia	*Prinia maculosa*	Unlisted	Least Concern	Near Endemic
Large-billed Lark	*Galerida magnirostris*	Unlisted	Least Concern	Near Endemic
Namaqua Warbler	*Phragmacia substriata*	Unlisted	Least Concern	Near Endemic

The aquatic specialist identified the ridges and watercourses within the study area as having a very High Site Ecological Importance, with the remainder of the site having a High Site Ecological Importance. The proposed Bulskop PV site avoided all watercourses and ridges. The main access to the site crosses a non perennial watercourse, and the impacts of this crossing have been assessed.

5.7 AQUATIC COMPOSITION OF THE STUDY SITE

The Biodiversity Company undertook an Aquatic Ecosystems Assessment. Please refer to the Aquatic Ecosystems Impact Assessment attached in **Annexure E1** from which the following has been drawn.

Topographical data for the quaternary degree squared (QDS 3222) does not indicate the presence of water resources within the footprint of the PV facility. The proposed access road does however cross a non perennial watercourse.

A portion of the development area was classified as a “dry” plain. This is consistent with the habitat classification for this area, namely the Southern Karoo Riviere Plains.

No watercourses are overlapped by the PV area. Further to this, this dataset does not indicate the presence of any wetland systems which must have one or more of the following attributes to meet the NWA wetland definition namely:

- A high-water table that results in the saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil;
- Wetland or hydromorphic soils that display characteristics resulting from prolonged saturation, i.e. mottling or grey soils; and
- The presence of, at least occasionally, hydrophilic plants, i.e. hydrophytes (water loving plants).

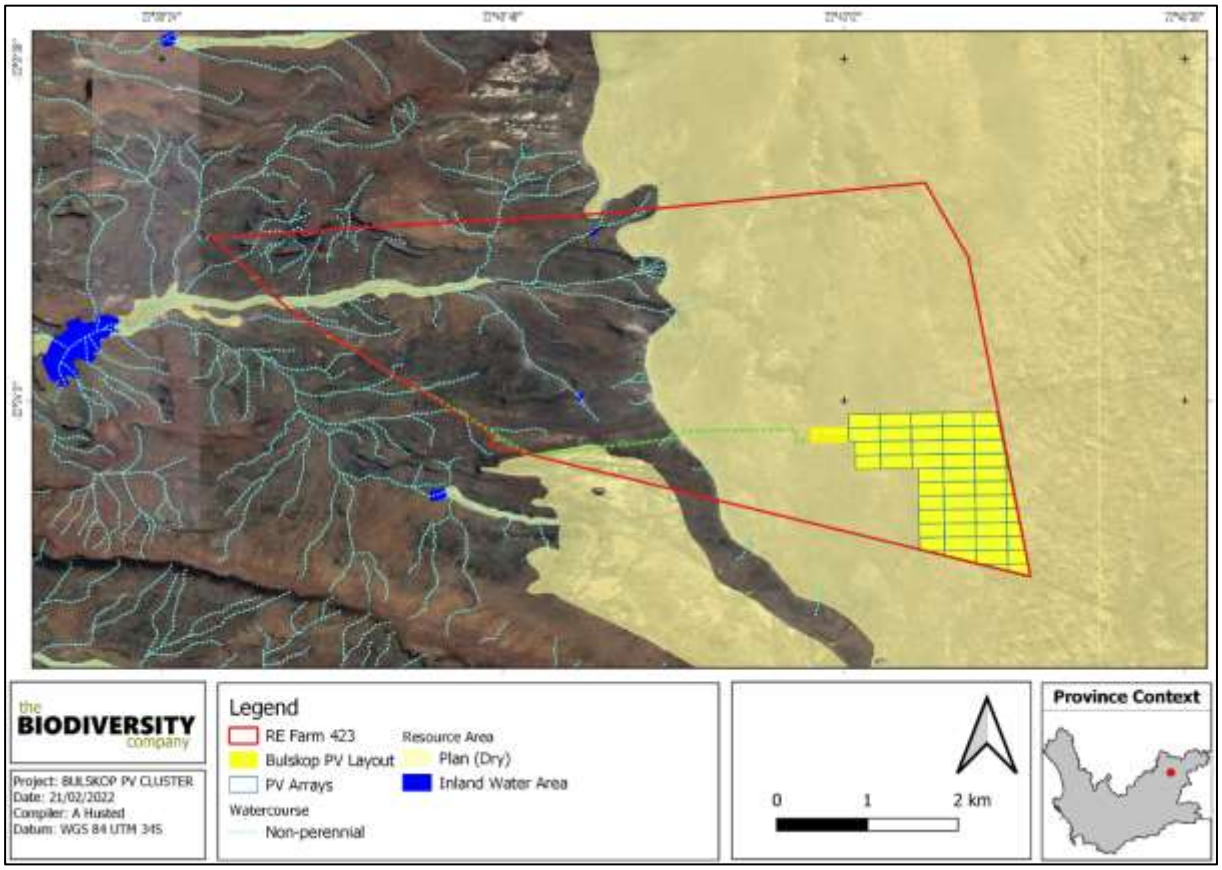


Figure 42: The inland water features and river lines / areas for QDS 3222 (The Biodiversity Company, 2022)

The study area is predominantly located in the Breede-Gouritz Water Management Area (WMA8) (NWA, 2016), and the Great Karoo ecoregion. However, the eastern part of the study area drains into the Mzimvubu-Tsitsikamma WMA (WMA8). The greater study area is located across the J21A quaternary catchment, which drains numerous drainage lines including the Hansrivier River in a south westerly direction into the Gamka River, which eventuates into the Gouritz River. The development area is situated on a non-perennial plain within the Southern Karoo Rivière vegetation types, which drains in a northernly direction into the L11F Platdoring catchment.

The development area falls along the watershed between the two J21A and L11F catchments. Rainfall patterns indicate a mean annual precipitation of 210 mm (weatherbase.com), with summer and winter rainfall periods and peak rainfall periods occurring between December and March. Rainfall averages indicate poor rainfall between June 2017 and October 2019.

Most of the development area falls within the L11F-7198 sub-quaternary reach (SQR). The Platdoring catchment is represented by the L11F-7198 SQR, which is classed as largely natural (class B) with few modifications occurring within the catchment. Ecological importance and sensitivity of the catchment is rated as moderate, with high habitat continuity, however, low to moderate ecological importance of riparian and wetland taxa, and which are adapted to no flow conditions and flooding events.

Figure 43: Ecological condition and classification of the Platdoring catchment (The Biodiversity Company 2022)

River	Platdoring
SQR	L11F-7198
Present Ecological Status	Largely Natural (class B)
Ecological Importance	Moderate
Ecological Sensitivity	Moderate
Catchment impacts contributing to PES (DWS, 2021)	General, habitat & continuity (fish): V arid area; numerous anti-erosion berms. Habitat (invertebrates) & flow: Erosion berms result in alteration of channel form. Riparian/wetland zone & continuity: Alluvial floodplain.
Ecological Importance Comments	Geomorph zone is a E (low gradient river typically characterised by mixed alluvial substrate pool-run/riffles): habitat-flow sensitivity = low; mean low-flow width approx. 5m, which is considered a medium-sized river (5 to 10m): width-flow sensitivity = medium. Reach length 19.5 km: length-flow sensitivity = low. Overall size/habitat-flow sensitivity = low. Species are either common/abundant within the region.
Ecological Sensitivity Comments	Instream verts are either highly mobile/not solely dependent on water within the region. Plant species are mostly tolerant + are adapted to both no/low flows + flooding events.
Longitudinal Zonation	Geomorph Zone E (lower foothills)
River Flow type	Ephemeral

The closest river to the site is the Hansrivier is as shown in the image below.

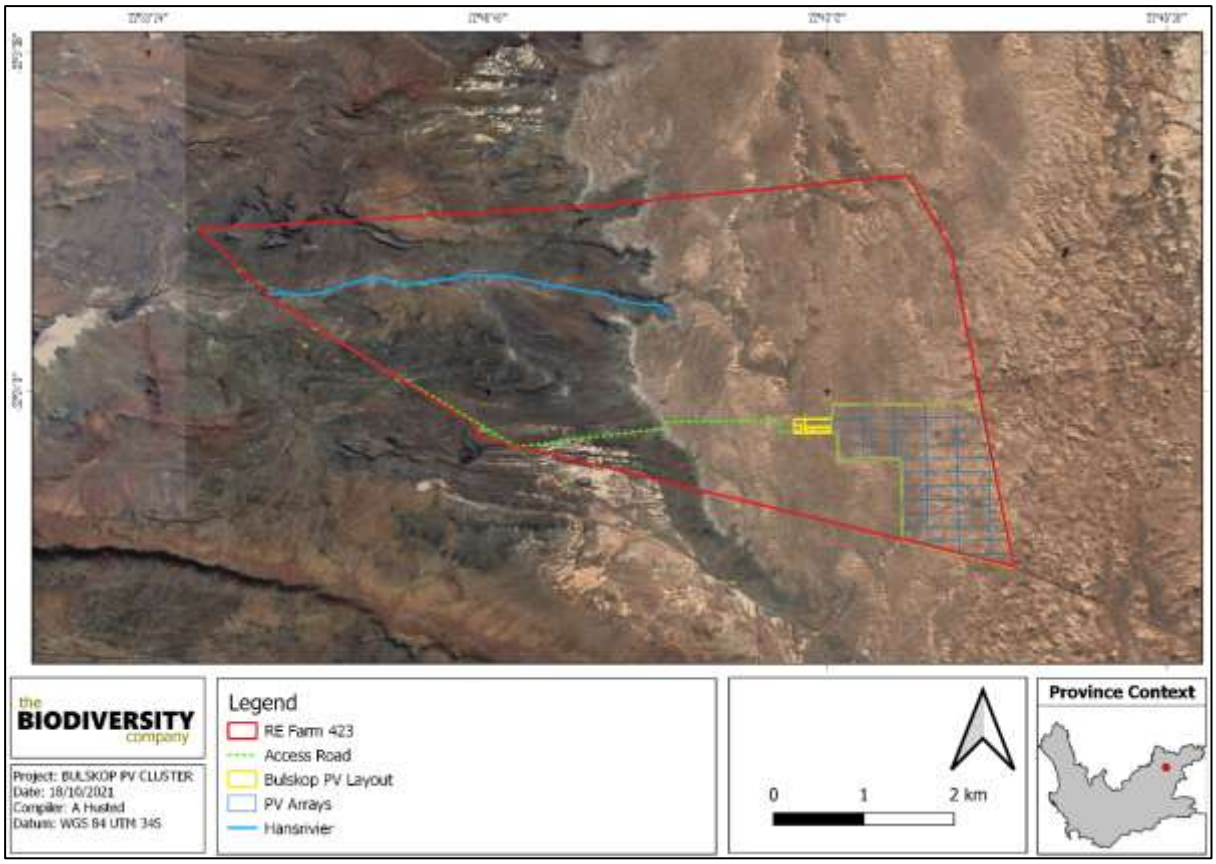


Figure 44: The Hansrivier in relation to the study site and Bulskop PV (The Biodiversity Company,2022)

The vegetation types of the development area are predominantly Southern Karoo Riviere types. Riverine features include valley floors and wide plains. Typical riparian thickets occur along the defined drainage lines of study area outside of the Bulskop PV development footprint as seen in the image below. An extensive network of 1st and 2nd order watercourses occur throughout the study area but outside of the development footprint. No drainage lines are recorded for the development footprint.

Figure 45: Well defined drainage line and riparian vegetation thicket situated outside of the development footprint within the study site (The Biodiversity Company, 2022)

Figure 46: First order drainage line with few vegetation indicators situated outside of the development footprint within the study site.

The development falls within a designate dry plain adjacent to the Platdoring River. The plain drains in a northernly direction into the L11F quaternary catchment. The plain area presented barely perceptible identifiers at ground levels. However, alluvial deposits were observed within the area as water remains stagnant and evaporates, leaving areas of deposition of finer clays. Areas washed of alluvial soils lie adjacent to these areas and the absence of alluvial soils is apparent.

Figure 47: Few identifying features at ground level within the development footprint (The Biodiversity Company, 2022)

Figure 48: The dry plain area presenting alluvial deposits (The Biodiversity Company, 2022)

Figure 49: The dry plain area washed of alluvial soils (The Biodiversity Company, 2022)

5.8 SOCIO ECONOMIC CONTEXT

This section is summarised from the Social Impact Assessment undertaken by Mr Tony Barbour (Appendix E9) and provides an overview of the spatial context of the Province, District Municipality, and Local Municipality within which Bulskop PV is proposed, and furthermore provides the socio-economic basis against which potential social issues have been identified and assessed.

5.8.1 Demographic Overview of the Beaufort West Municipality

The population of the Beaufort West Municipality in 2016 was 51 080. Of this total, 36.4% were under the age of 18, 56.7% were between 18 and 64, and the remaining 7% were 65 and older.

The population of Ward 2 (where the proposed Bulskop PV is proposed) in 2011 was 6 975. Ward 2 is therefore a large, sparsely populated area with no large settlements. Of this total, 28.2% were under the age of 18, 64.9% were between 18 and 64, and the remaining 6.9% were 65 and older. The Beaufort West Municipality has a relatively high percentage of people under the age of 18 and over the age of 65. This implies that a larger percentage of the population is dependent on the economically productive sector.

In terms of race groups, Coloureds made up 75.1% of the population on the Beaufort West Municipality (2016), followed by Black Africans (17.7%) and Whites, 7%. In Ward 2 (2011), Coloureds made up 60.8%, followed by Whites (27%) and Black Africans (10.8%). The main first language spoken in the Beaufort West Municipality and Ward 2 was Afrikaans (83% and 82.9% respectively), followed by isXhosa (13.1%) in the Beaufort West Municipality and English (2.9%) in Ward 2.

5.8.1.1 Households and house types

There are a total number of 14 945 (2016) and 2 020 (2011) households in the Beaufort West Municipality and Ward 2 respectively. Of these 99% (Beaufort West Municipality) and 81.4% (Ward 2) were formal houses. Only 0.3% of structures in the Beaufort West Municipality were shacks. The majority of dwellings in the Beaufort West Municipality and Ward 2 are therefore formal structures. Approximately 39.8% of the households in the Beaufort West Municipality and 24.2% of the households in Ward 2 were headed by women. The figures are lower than the district level, namely 40.8%, and similar to the provincial level (38%). Despite being lower than the district averages, women headed households tend to be more vulnerable and reflect a lack of employment opportunities in the area, which result in the men leaving to seek work in larger, urban areas.

5.8.1.2 Household income

Based on the data from the 2011 Census, 9.9% of the population of the Beaufort West Local Municipality had no formal income, 3.3% earned less than R 4 800, 5.8% earned between R 5 000 and R 10 000 per annum, 21.6% between R 10 000 and R 20 000 per annum and 23.7% between R 20 000 and 40 000 per annum (2016). For Ward 2, 8.2% of the population had no formal income, 1.9% earned less than R 4 800, 3.1% earned between R 5 000 and R 10 000 per annum, 16.3% between R 10 000 and 20 000 per annum and 19.4% between R 20 000 and 40 000 per annum (Census 2011).

The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 64.3% of the households in the Beaufort West Municipality and 48.9% in Ward 2 live close to or below the poverty line. The current figures for both the Beaufort West Municipality and Ward 2 are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

The low-income levels reflect the reliance on season employment in the agricultural sector and limited formal employment opportunities in the Beaufort West Municipality. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the Beaufort West Municipality. This in turn impacts on the ability of the Beaufort West Municipality to maintain and provide services.

5.8.1.3 Employment

The official unemployment rate in the Beaufort West Local Municipality in 2016 was 12.2%, while 44.1% were regarded as not economically active and 8.3% were discouraged work seekers. The figures for Ward 2 in 2011 were 6.2% and 37.1% respectively. These figures are significantly lower than the official unemployment 2011 rates for the Western Cape Province (21.6%) and National (29.8%). These lower rates do not however reflect seasonal unemployment which represents a significant challenge in the agricultural sector in the area.

The 2020 Socio-economic profile of the Beaufort West Municipality prepared by the Provincial Government notes that the Beaufort West Municipality (24.2%) had the highest unemployment area in the CKDM (22%) in 2019. The rate was also higher than the provincial rate (19.4%). The report notes that the high unemployment rate is particularly concerning given that this estimate is based on the narrow definition of unemployment i.e., the percentage of people that are able to work, but unable to find employment. In turn, the broad definition generally refers to people that are able to work, but not actively seeking employment. The current unemployment rates are likely be higher due to impact of COVID-19 pandemic on the national, provincial, and local economy.

5.8.1.4 Education

In terms of education levels, the percentage of the population over 20 years of age in the Beaufort West Municipality and Ward 2 with no schooling was 5.5% (2016) and 6.8% (2011) respectively, compared to 2.4% for the Western Cape (2016). The percentage of the population over the age of 20 with matric was 32.3% and 28.3% respectively, compared to 35.2% for the Western Cape. The education levels in the Beaufort West Municipality and Ward 2 are therefore marginally lower than the provincial levels. This reflects the rural nature of the area and the highlights the vulnerability of the local communities in these areas.

5.8.2 Municipal Service Levels in Beaufort West Municipality

5.8.2.1 Access to water

Based on the 2016 Household Community Survey, 78.4% of households in the Beaufort West Local Municipality have piped water inside their houses, while 17.7% relied on piped water in their yards. Based on the 2011 Census, 58.1% of households in Ward 2 were provided water by a service provider and 36.6% relied on boreholes. The figures for Ward 2 reflect the rural nature of the area. In addition, due to the rural, dispersed nature of the area, it is both difficult and costly to provide municipal services, hence the reliance on boreholes.

5.8.2.2 Sanitation

98% of the households in the Beaufort West Municipality had flush toilets, while only 0.3% had no access to sanitation facilities. In Ward 2, 82.4% of households had flush toilets and 7.5% had no access to sanitation facilities.

5.8.2.3 Refuse collection

94.9% of the households in the Beaufort West Municipality had their waste collected by a service provider on a regular basis, while 3% relied on their own dump. In Ward 2, 61% had their waste collected by a service provider on a regular basis and 30.3% relied on their own dump. The figures for Ward 2

reflect the rural nature of the area. In addition, due to the rural, dispersed nature of the area, it is both difficult and costly to provide municipal services, hence the reliance on their own dump.

5.8.3 Socio-Economic Overview of the Beaufort West Local Municipality[34]

In 2018 the economy of the Beaufort West municipal area was valued at R2.2 billion (current prices) and employed 12 515 people. Historical trends between 2014 and 2018 indicate that the municipal area realised an average annual growth rate of 0.6%. While growth within the primary sector remained relatively stagnant between 2014 and 2018 (0.1%), the secondary and tertiary sectors grew at 0.4 and 0.8 % respectively. The economy is overall expected to contract by 1.1% in 2019. Like the rest of South Africa, economic growth in 2020 and 2021 will be negatively impacted by COVID 19. This is expected to affect each of the key economic sectors.

In terms of sectoral contributions, general government (R475.5million), transport, storage, and communication (R369.8million) and the wholesale and retail trade, catering, and accommodation (R329.3million) sectors were the main contributors to growth in the municipal area.

The latter two sectors are however both expected to contract in 2019 (0.6 and 0.1 % respectively). Although the agriculture, forestry and fishing sector contributed a significant number of additional jobs in the CKD between 2014 and 2018 (47jobs), it is estimated that this sector suffered the largest GDPR contraction (8.7percent) in 2019. The contribution in terms of generating new employment opportunities will therefore be limited

5.9 VISUAL CONTEXT

Mr Stephen Stead of Visual Resource Management Africa (VRMA) undertook a Visual Impact Assessment of the proposed Bulskop PV (See Appendix E8). The following visual context was determined from this study.

The following landscape value issues were flagged by the specialist during his site investigation.

- No significant landscape features on the proposed development sites with the majority of the site viewed rated Medium to Low for scenic appeal.
- The background views of the great Escarpment do add to the regional scenic quality.
- Landscape resources are being used for tourism, including the Karoo National Park landscapes (Very Low Exposure), and the Steenbokkie Private Nature Reserve (High Exposure)
- Eskom power line infrastructure to the north of the site degrades the local scenic quality (including this portion of the Steenbokkie Private Nature Reserve.
- There are limited High Exposure Receptors due to the rural agricultural context.

5.9.1 Regional Locality

Existing development has been historically restricted to settlement nodes located close to water resources. The town of Beaufort West lies south of the Nuweveld Mountains range which forms part of the Great Escarpment which divides South Africa into two distinct basins. The town lies between the Gamka and Kuils Rivers (normally dry) and on the outskirts of Beaufort West lies the 75 000 ha Karoo National Park.

[34] Based on 2020 Socio-economic Profile: Beaufort West Municipality, prepared by the Western Cape Government

5.9.2 Vegetation

Vegetation type has a large factor in determining the scenic quality or the site in terms of colour and texture, as well as influencing the local ability of the landscape to absorb the landscape change.

The Bioregion where the development is proposed is Lower Karoo Bioregion with the Biome described as Nama-Karoo. The SANBI vegetation data reflects two vegetation types, the Southern Karoo Riveriere, and the Gamka Karoo.

It is important to note that the area is arid, with high summer temperature averages. The low rainfall of the region results in vegetation being low in profile, which in relation to the flat terrain creates a uniform vegetated landscape that has a low visual absorption capacity for flatter terrain areas. As there is very little vegetation variation, the landscape will be described as Nama-Karoo.

5.9.3 Mountain and Hill Features

As depicted in the photograph below, the Great Escarpment of the Great Karoo is visible to the north and reaches approximately 1000m above sea level above the plains to the south of the town of Beaufort West. This creates a significant visual resource which is located in 14km to the north of the solar plant.

Figure 50: View of the Escarpment as seen from the N1 National Highway (Stead, 2022).

5.9.4 Infrastructure and Road Access

The N1, the main transport route from the Western Cape to Gauteng, is located 13km north of the PV area. The route passes through some of the most scenic areas of South Africa and is well used by tourists. As depicted in the photograph below, taken from the N1 in a SW direction, the views of the great escarpment are a significant feature in the landscape and do add value to the landscape character. The proposed Bulskop PV is well set back from the N1 National Road, and any landscape changes on site would not be visible from these receptors. The other main road infrastructure is the R61. The R61 is located 3.5km to the west of the proposed PV site, where the receptor would be able to see the landscape change. As this route could include tourist traffic, it should be included as a Key Observation Point.

Figure 51: Photograph of N1 scenic route (Stead, 2022)

With the location of the Eskom Droerivier Substation in the vicinity, a significant number of Transmission Power Lines are located in the area. On the western boundary of the proposed PV sites, is a double 400kV power line corridor. The lattice type structures do assist in reduce the visual intrusion, but the size and scale of the pylons clearly dominate the attention of the casual observer and degrade the local sense of place.

Figure 52: Eskom Droerivier substation and transmission power line corridors (Stead, 2022)

5.9.5 Other Renewable Energy Projects

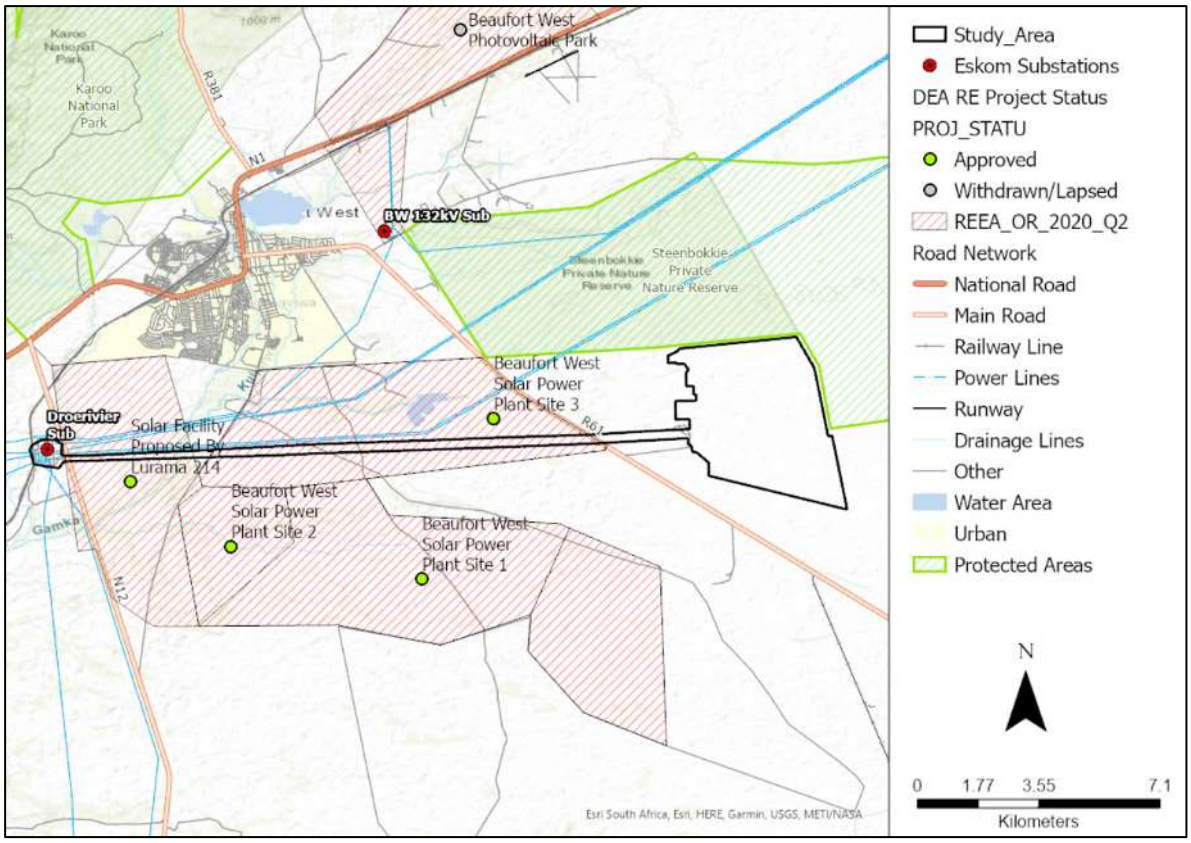


Figure 53: Map depicting DEA REEA Renewable Energy project status (Stead, 2022)

Numerous other projects have been attracted to the site due to the solar energy potential of the region. The Beaufort West Solar Park is indicated on the map with the status lapsed. There are four other solar energy projects located around the town of Beaufort West that have been approved and none of them have been constructed. None are located within the proposed solar park zone of visual influence which reduced the potential for cumulative visual effects from combined views. Located further to the north is the proposed Beaufort West Wind Farm. As this wind farm is located more than 15 km to the north, the combined views of the wind farm and the proposed solar plant are unlikely to result in visual clutter. None of the proposed developments that were authorised have been constructed. However, once these projects are developed, it is likely that the existing arid Karoo agricultural landscape will change to one more associated with renewable energy. This change is aligned with National Renewable Energy policy planning, with the area falling with the Beaufort West REDZ.

5.9.6 Nature and Tourism Activities

Two conservation areas are located around the proposed PV Development. The Karoo National Park is located approximately 17 km to the west, with the Steenbokkie Private Nature Reserve located adjacent to the north. While the Steenbokkie Private Nature Reserve is a minor conservation area, the Karoo National Park is a large national protection area and a major tourist attraction for the area. As depicted in the photographs below, the scenic vistas of the karoo national park have aesthetic value. . However, the viewshed analysis indicates that this area falls outside of the project Zone of Visual Influence.

Figure 54: Karoo National Park *(Stead, 2022)*

Located directly to the north of the proposed PV area, is the Steenbokkie Private Nature Reserve. The area is a proclaimed conservation area and offers recreational facilities including overnight and caravan accommodation. The reserve also offer walking and trails are posted along the low ridgeline that runs through the site. There is some game enclosed which can be viewed by vehicle. As mentioned, two 400kV power lines corridors, each with 2 routings, is located to the east of the conservation area. There is also a servitude in place for an additional 400kv powerline from a windfarm cluster 80km north of Bulskop PV. This does degrade the local sense of place, dominating the attention of the casual observer. The other key factor in protecting the western portion of the conservation area is the low ridgeline aligned north-south through the centre of the property. The accommodation areas are all located to the west of the ridgeline, screening the receptors from the power lines. The ridgeline would also obscure views of the proposed PV project. However, views from the hiking path along the ridgeline would allow for clear, medium exposure views of the PV site. However, the powerlines located within the foreground do reduce the scenic quality of this eastern vista.

Figure 55: View from the Steenbokkie Private Nature Reserve ridgeline towards the PV site with the multiple Eskom power lines in the foreground (Stead, 2022)

The map below depicts the location of the power lines in relation to the proposed PV and the Steenbokkie Private Nature Reserve. Also depicted is the boundary of the proposed Beaufort West PV3 development, authorised but not yet built, that will also influence the sense of place of the reserve.

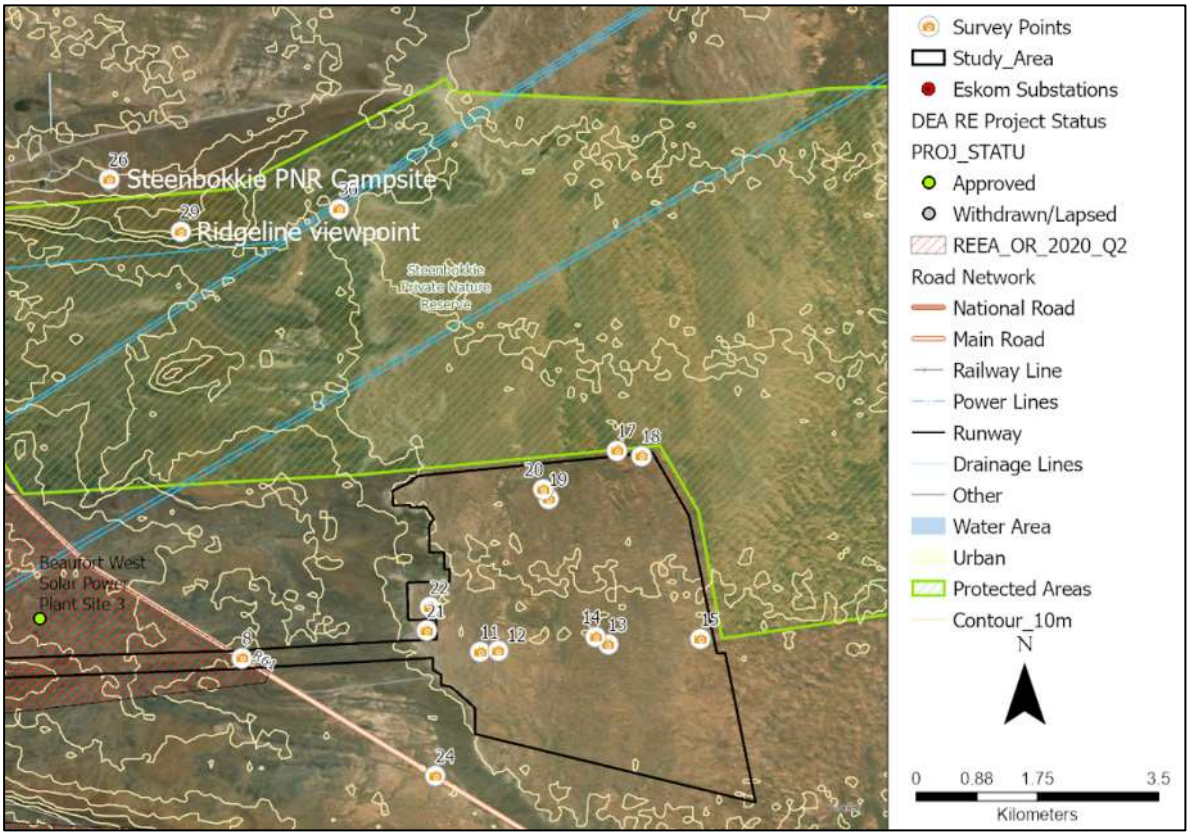


Figure 56: Steenbokkie Private Nature Reserve accommodation centre (Point 26), ridgeline (Point 28), Eskom power lines (Point 30) and other proposed PV developments that could influence the nature reserve sense of place (Stead, 2022)

6. IMPACT ASSESSMENT

This section was of the report was completed with input from the following specialists:

- Terrestrial Biodiversity (The Biodiversity Company, 2022)
- Avifauna (The Biodiversity Company, 2022)
- Plant Species (The Biodiversity Company, 2022)
- Animal Species (The Biodiversity Company, 2022)
- Aquatic Biodiversity (The Biodiversity Company, 2022)
- Agricultural (Johan Lanz 2022)
- Palaeontology (John Almond, 2022)
- Archaeology and Heritage (Jenna Lavin, 2022)
- Visual (Stephen Stead, 2022)
- Socio Economic (Tony Barbour, 2022)
- Traffic Impact Assessment (JG Afrika, 2022)
- Town and Regional Planning (Townscape Planning Solutions, 2022)

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The impacts will firstly be discussed per specialist discipline and then summarised in the impact summary and statement below.

6.1 ASSESSMENT METHODOLOGY

All possible impacts need to the assessed – the **direct, in-direct as well as cumulative impacts**. The following general assessment methodology has been applied:

- **Nature of the impact:** impacts associated with the proposed Bulskop PV have been described in terms of whether they are negative or positive and to what extent.
- **Duration of impacts**: Impact were assessed in terms of their anticipated duration:
    - Short term (e.g., during the construction phase – 0 – 2 years)
    - Medium term (e.g., during part or all of the operational phase – 2 - 20 years)
    - Long term (e.g., > 20 years)
    - Permanent (e.g., where the impact is for all intents and purposes irreversible)
    - Discontinuous or intermittent (e.g., where the impact may only occur during specific climatic conditions or during a particular season of the year)
- **Intensity or magnitude**: The size of the impact (if positive) or its severity (if negative):
    - Low, where the receiving environment (biophysical, social, economic, cultural etc) is negligibly affected or where the impact is so low that the remedial action is not required;
    - Medium, where the receiving environment (biophysical, social, economic, cultural etc) is altered, but not severely affected, and the impact can be remedied successfully; and
    - High, where the receiving environment (biophysical, social, economic, cultural etc) would be substantially (i.e., to a very large degree) affected. If a negative impact, could lead to irreplaceable loss of a resource and/or unacceptable consequences for human wellbeing.
- **Probability**: Should describe the likelihood of the impact actually occurring indicated as:
    - Improbable, where the possibility of the impact is very low either because of design or historic experience;
    - Probable, where there is a distinct possibility that the impact will occur;
    - Highly probable, where it is most likely that the impact will occur; or
    - Definite, where the impact will occur regardless of any prevention measures.
- **Significance:** The significance of impacts can be determined through a synthesis of the assessment criteria. Significance can be described as:
    - Low, where it would have negligible effect on the receiving environment (biophysical, social, economic, cultural etc), and on the decision;
    - Medium, where it would have a moderate effect on the receiving environment (biophysical, social, economic, cultural etc), and should influence the decision;
    - High, where it would have, or there would be a high risk of, a large effect on the receiving environment (biophysical, social, economic, cultural etc). These impacts should have a major influence on the decision;
    - Very high, where it would have, or there would be a high risk of, an irreversible negative impact on the receiving environment (biophysical, social, economic, cultural etc) and irreplaceable loss of natural capital/resources or a major positive effect on human well-being. Impacts of very high significance should be a central factor in decision-making.
    - Provision should be made for with and without mitigation scenarios.

- Reversibility:
    - Reversible, the impact can be managed to a low to high degree and is not permanent; or
    - Irreversible, the impact can only be managed to a limited degree and is permanent.
- **Confidence**: The level of confidence in predicting the impact can be described as:
    - Low, where there is little confidence in the prediction, due to inherent uncertainty about the likely response of the receiving ecosystem, or inadequate information;
    - Medium, where there is a moderate level of confidence in the prediction, or
    - High, where the impact can be predicted with a high level of confidence
- **Consequence**: What will happen if the impact occurs
    - Insignificant, where the potential consequence of an identified impact will not cause detrimental impact to the receiving environment;
    - Significant, where the potential consequence of an identified impact will cause detrimental impact to the receiving environment.
    - Provision must be made for with and without mitigation scenarios.

The impacts should also be assessed in terms of the following aspects:

- **Status of the impact**

The specialist should determine whether the impacts are negative, positive or neutral ("cost – benefit" analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

- **Cumulative impact**

Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments planned and already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.

Care must be taken to ensure that where cumulative impacts can occur that these impacts are considered and categorised as **additive** (incremental or accumulative); **interactive**, **sequential** or **synergistic**.

Based on a synthesis of the information contained in the above-described procedure, the specialists assessed the potential impacts in terms of the following significance criteria:

- **No significance**: The impacts do not influence the proposed development and/or environment in any way.
- **Low significance**: The impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.
- **Moderate significance**: The impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.
- **High significance**: The impacts will have a major influence on the proposed development and/or environment.

Where relevant, all specialists have assessed the preferred footprint (Layout Alternative 1) and the No-Go Alternative 1 using the abovementioned general methodology as a Basis. Please note that each

specialist utilises rating and waiting criteria specific to their discipline in order to determine the significance of specific impacts.

6.2 IDENTIFICATION OF IMPACTS ASSESSED

This section simply lists the potential key impacts identified and assessed by the various specialists (more details on the significance and ratings of these impacts are provided in section 6.4 – 6.11 below and in the specialist reports attached in Appendix E).

6.2.1 Terrestrial Biodiversity Impacts Assessed

6.2.1.1 Construction Phase Impacts

- Destruction, fragmentation and degradation of habitats and ecosystems;
- Spread and/or establishment of alien and/or invasive species;
- Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration);
- Mortalities and displacements of fauna and flora SCCs; and
- Chemical pollution associated with dust suppressants for roads and laydown areas

6.2.1.2 Operational Phase Impacts

- Continued fragmentation and degradation of habitats, ecosystems and CBA1 and 2 areas;
- Spread of alien and/or invasive species;
- Displacement, direct mortalities and reduced dispersal/migration of faunal community (including SCC) due to disturbance (road collisions, collisions with solar panels and substation/powerlines, noise, light, dust, vibration); and
- Chemical pollution associated with measures to keep PV clean

6.2.1.3 Decommissioning Phase Impacts

- Continued fragmentation and degradation of habitats and ecosystems; and
- Spread of alien and/or invasive species.

6.2.2 Agricultural Impacts Assessed[35]

- Loss of agricultural potential by occupation of land
- Loss of agricultural potential by soil degradation
- Dust impact.
- Enhanced agricultural potential through increased financial security for farming operations (positive impact)

6.2.3 Avifaunal Impacts Assessed

6.2.3.1 Pre-construction Phase Avifaunal Impacts

- Temporary disturbance of avifauna due to increased human presence and possible use of machinery and/or vehicles.

6.2.3.2 Construction Phase Avifaunal Impacts

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, dust, vibrations);
- Collection of eggs and poaching;

[35] The agricultural impacts identified apply equally to all phases of the development.

- Roadkill by the construction vehicles (some birds gets blinded by lights or has a freeze response to disturbance ;
- Chemical pollution associated with dust suppressants; and
- Displacement or death of SCCs.

6.2.3.3 Operational Phase Avifaunal Impacts

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, light, dust, vibrations);
- Collection of eggs and poaching;
- Roadkill;
- Collisions with PV panels and associated infrastructure;
- Electrocution by infrastructure and connections to PV;
- Chemical pollution associated with measures to keep PV clean;
- Fencing of PV site, especially a risk for larger birds; and
- Displacement or death of SCCs.

6.2.3.4 Decommissioning Phase

- Habitat Loss (Destroy, fragment, and degrade habitat, ultimately displacing avifauna);
- Sensory disturbances (e.g. noise, dust, vibrations);
- Roadkill;
- Collisions with PV and associated infrastructure; and
- Fencing of PV site, especially a risk for larger birds.

6.2.4 Aquatic Biodiversity Impacts Assessed

6.2.4.1 Construction Phase Aquatic Biodiversity Impacts

- Increased runoff and sediment input into the water courses
- Smothering and subsequent loss of instream habitat due to sediment inputs
- Flow path modification
- Input of toxicants
- Alteration to flow patterns and velocities
- Erosion of exposed surfaces
- Physical changes (e.g., turbidity)
- Chemical changes (e.g., pH, salinity toxicants and heavy metals)
- Indiscriminate dumping of rubble and construction material
- Improper re-establishment of flow paths
- Increased sedimentation
- Increased erosion from exposed surfaces

6.2.4.2 Operational Phase Aquatic Biodiversity Impacts

- Flow alteration/concentrations during heavy precipitation events
- Flow concentration leading to increased erosion and scouring downstream systems
- Increased runoff and flow velocities entering the watercourse
- Increased flow concentration
- Increased erosion and scouring of bed and banks, especially in discharge areas
- Increased sedimentation and turbidity
- Watercourse and water quality impairment
- Increased exposed and hardened surfaces
- Degradation of watercourse flora and fauna through the spread of alien and invasive species
- Increased litter and refuse within the channel
- Input of toxicants

- Nutrient loading

6.2.4.3 Decommissioning Phase Aquatic Biodiversity Impacts

The decommissioning impacts are deemed to be similar to those outlined for the construction phase.

6.2.5 Heritage Impacts Assessed[36]

- Impacts on Cultural Landscape
- Impacts on Archaeology Resources
- Impact on Palaeontology Resources

6.2.6 Visual Impacts Assessed

6.2.6.1 Construction Phase Visual Impacts:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

6.2.6.2 Operational Phase Visual Impacts

- Massing effect in the landscape from a large-scale modification.
- On-going soil erosion.
- On-going windblown dust.

6.2.6.3 Decommissioning phase Visual Impacts

- Movement of vehicles and associated dust.
- Wind-blown dust from the disturbance of cover vegetation / gravel.

6.2.6.4 Cumulative visual Impacts

- A long-term change in land use setting a precedent for other similar types of solar energy projects.

6.2.7 Traffic Impacts Assessed

6.2.7.1 Construction phase Traffic Impacts

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching for electrical cables and other ancillary construction works that will temporarily generate the most traffic.

6.2.7.2 Operational phase Traffic Impacts

The traffic generated during the operational phase will be minimal and will not have an impact on the surrounding road network.

6.2.7.3 Cumulative Traffic Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

[36] Impact on heritage resources will occur in the construction phase and that impact will remain.

6.3 SITE SENSITIVITY CONSTRAINTS AND POTENTIAL RISKS & IMPACTS

The following spatial site-specific constraints were identified by various specialists and the EAP during the initial stage of the environmental process.

Table 20: Summary of potential site constraints identified during the initial phase of the BAR Process, and which are assessed in the section below.

Specialist Discipline	Site Constraints
Terrestrial Biodiversity.	Drainage Lines and Ridges
Animal Species	Sensitive habitat associated with Drainage Lines and Ridges.
Plant Species	Sensitive habitat associated with Drainage Lines and Ridges
Aquatic Biodiversity	Drainage Lines and Valley Bottomed Wetlands
Avifauna	Watercourses and Ridges
Agricultural	No specific spatial constraints identified.
Heritage	No specific spatial constraints identified
Visual	Scenic receptors, namely the R61 and Steenbokkie Nature Reserve.
Traffic	Insufficient line of site distance at existing farm access point.

The preferred layout alternative was developed to exclude the Drainage Lines, Ridges and as well as their buffers determined by the Terrestrial and Aquatic Specialists. The visual buffers on the Steenbokkie Nature Reserve as recommended by the Visual Specialist were also incorporated into the preferred alternative.

Furthermore the preferred access point into the farm was relocated 2.3 kilometres to the Northwest of the existing farm entrance to ensure the sufficient site distances identified by the Traffic Specialist.

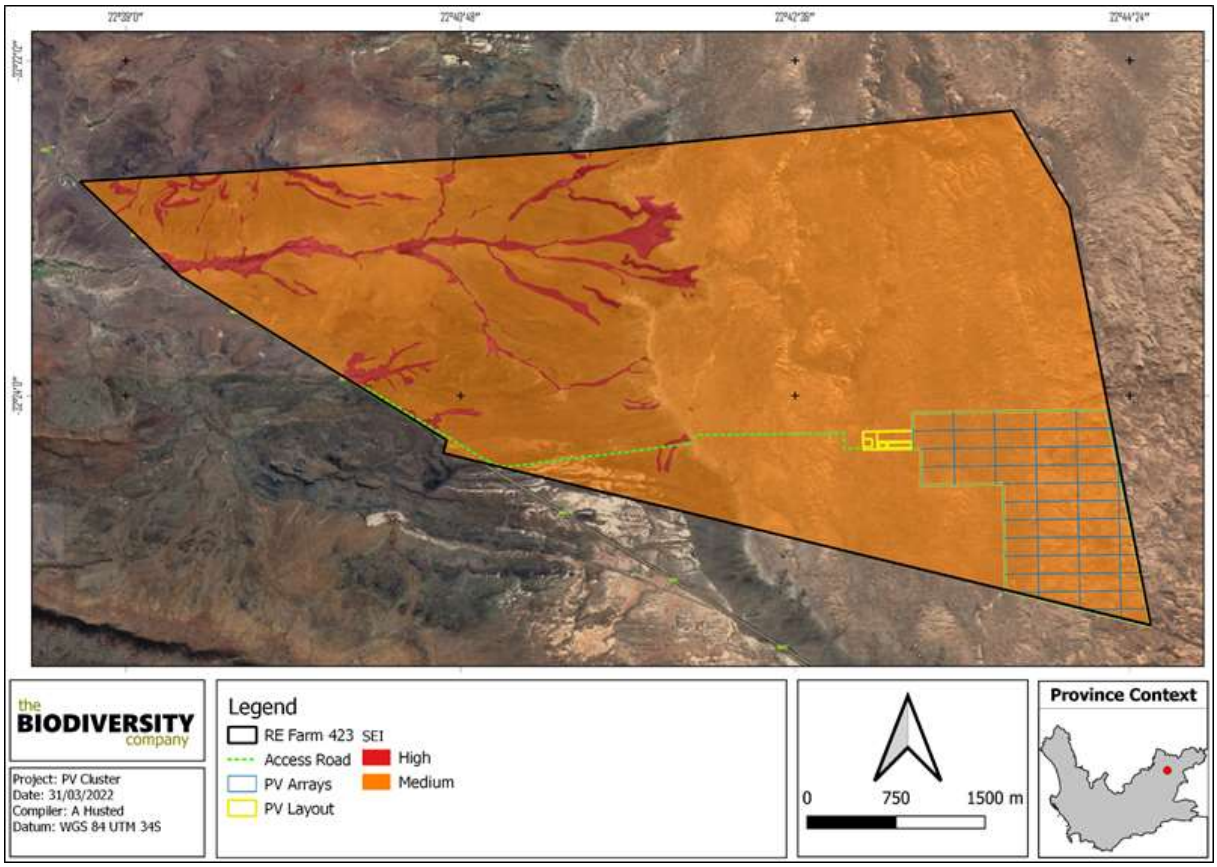

Figure 57: Site Ecological Importance (Terrestrial Biodiversity) of Bulskop PV (The Biodiversity Company 2022)

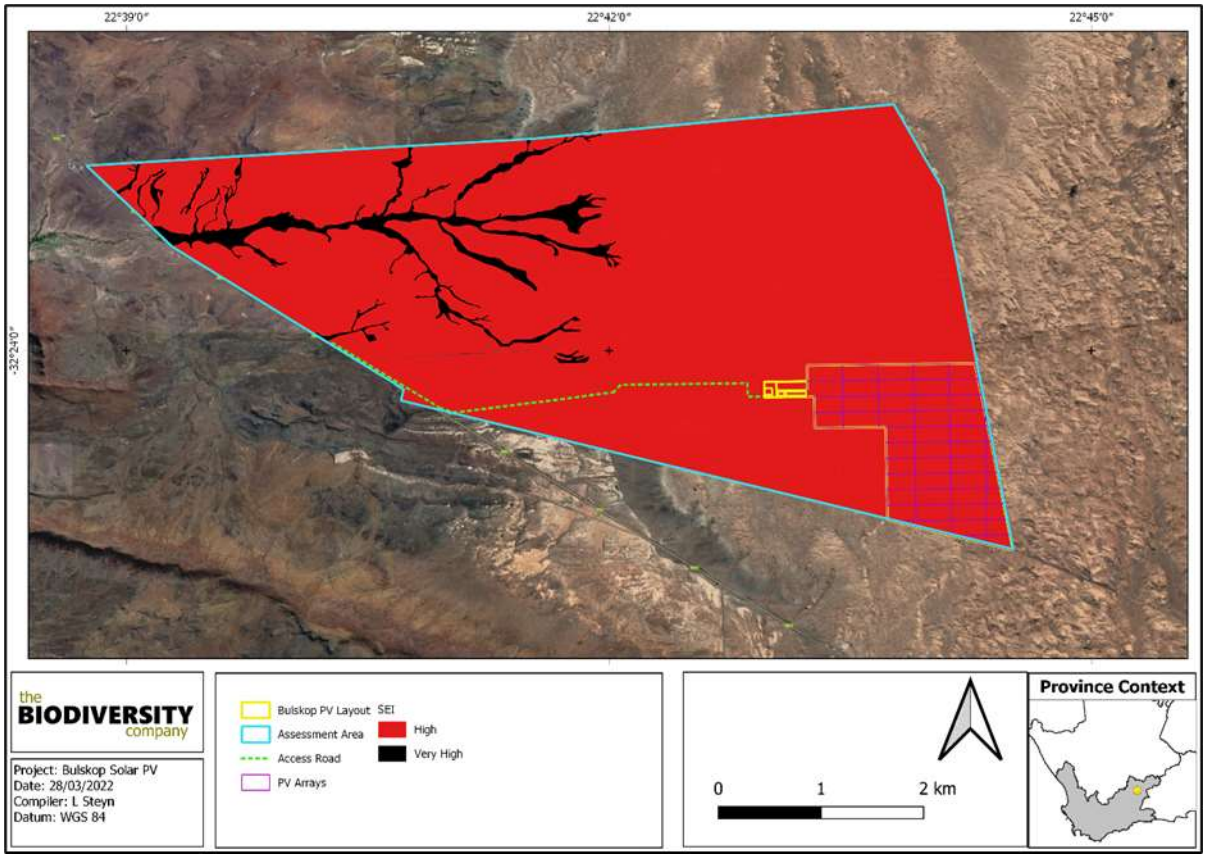

Figure 58: Site Ecological Importance (Avifaunal) of Bulskop PV (The Biodiversity Company 2022)

As seen in the image below, the watercourses are considered to have a very High Site Ecological Importance. The remainder of the site is deemed to have a high importance due to confirmed or occurrence of populations of near threatened species, threatened species or the Presence of range-restricted species.

Kindly refer to section 2.9 and section 2.10 above and the detailed layout plan in Appendix D for details as to how the preferred alternative incorporated these sensitive features.

All high sensitivity terrestrial biodiversity features were avoided and excluded from the preferred footprint of the PV. The proposed main access road does cross a non perineal watercourse considered to be of high terrestrial biodiversity importance. All very high avifaunal sensitive areas were avoided by the footprint of the PV development. Due this avoidance approach all overall Impacts were able to be effectively mitigated to an extent that no Critical, Very-High or High Impacts remain after mitigation. All impacts assessed range from High Positive to Moderate Negative, with a single Moderate – High impact associated with visual massing during the operational phase.

6.4 TERRESTRIAL BIODIVERSITY IMPACTS

A Terrestrial Biodiversity Impact Assessment (covering Animal Species, Plant Species and Terrestrial Biodiversity) was undertaken by the Biodiversity Company and is attached in Annexure E1**.** The following has been summarised from this assessment.

6.4.1 Construction Phase Terrestrial Biodiversity Impacts[37]

As can be seen in the table below loss of habitat and the degradation of habitat were rated as **High** significance prior to mitigation measurers. Through the implementation of mitigation measures this can be reduced to **Moderate**.

The risk of the spread of alien invasive species was rated **High** prior to the implementation of an alien management plan. Should the alien spread be successfully mitigated the risk can be reduced to **Low**.

Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration) was rated as **Moderately High** prior to mitigation and **Low** after mitigation.

Mortalities and displacements of fauna and flora species of conservation concern which could occur within the development site was rated as **Moderate** prior to mitigation and **Low** significance after mitigation.

Table 21: Assessment of Construction Phase Terrestrial Biodiversity Impacts.

Nature: Destruction, fragmentation and degradation of habitats, and ecosystems		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000 ha impacted / Linear features affected < 1000 m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100 m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Small / ecosystem structure and function largely unchanged	Small / ecosystem structure and function largely unchanged
Probability	Definite	Highly likely

[37] The impact tables in this section reflect those of the preferred alternative ?(Layout Alternative 1. Cumulative and no-go impacts assessed in following separate sections.

Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Irreversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment.	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Spread and/or establishment of alien and/or invasive species		
	Without Mitigation	**With Mitigation**
Extent/ Spatial Scope	Local area/ within 1 km of the site boundary / < 5000 ha impacted / Linear features affected < 1000 m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100 m
Duration	Permanent	One year to five years: Medium Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Irreversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology with limited sensitivity/importance
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Displacement of faunal community (Including possible SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration);		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000 ha impacted / Linear features affected < 1000 m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100 m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology critically sensitive /important
Can impact be mitigated?	Yes	

Mitigation:	See Section 7 where mitigation is discussed separately

Nature: Mortalities and displacements of fauna and flora SCCs		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000 ha impacted / Linear features affected < 1000 m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100 m
Duration	One year to five years: Medium Term	One month to one year: Short Term
Magnitude / Severity	Small / ecosystem structure and function largely unchanged	Small / ecosystem structure and function largely unchanged
Probability	Highly likely	Likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Significant / ecosystem structure and function moderately altered	Ecology highly sensitive /important
Can impact be mitigated?	yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

6.4.2 Operational Phase Terrestrial Biodiversity impacts[38]

The tables below summarise the significance of the operational phase impacts on biodiversity before and after implementation of mitigation measures.

The impact significance of displacement and direct mortalities of fauna were rated as **Moderate** prior to mitigation. Implementation of mitigation measures reduced the significance of the impact to a **Low** level.

The construction of fences can lead to the animals getting trapped or cut off from resources such as water sources. This can be mitigated by the construction of fences with small access points to allow for faunal movement.

The continued fragmentation and degradation of habitats, ecosystems and CBA1 and CBA2 areas, was rated as Moderately **High** prior to mitigation and **Moderate** after mitigation.

Unchecked the spread of alien and/or invasive species was rated as **moderately high** prior to mitigation and **Low** with mitigation.

The effect of chemical pollution associated with measures to keep PV clean, is rated as **moderate** prior to mitigation and **Low** after mitigation.

Table 22: Assessment of Operational Phase Terrestrial Biodiversity Impacts.

Nature: Continued fragmentation and degradation of habitats and ecosystems		
	Without Mitigation	**With Mitigation**

[38] The impact tables in this section reflect those of the preferred alternative ?(Layout Alternative 1. Cumulative and no-go impacts assessed in following separate sections.

Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Significant / ecosystem structure and function moderately altered
Probability	Highly likely	Likely
Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Irreversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology highly sensitive /important
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Spread and/or establishment of alien and/or invasive species		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Highly likely	Likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology highly sensitive /important
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000 ha impacted / Linear features affected < 1000 m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100 m
Duration	Life of operation or less than 20 years: Long Term	One year to five years: Medium Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged

Probability	Likely	Possible
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Reduced dispersal of fauna		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology with limited sensitivity/importance
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Chemical pollution		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Permanent	Permanent
Magnitude / Severity	Small / ecosystem structure and function largely unchanged	Insignificant / ecosystem structure and function unchanged
Probability	Highly likely	Highly likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Irreversible	Irreversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology with limited sensitivity/importance	Ecology with limited sensitivity/importance
Can impact be mitigated?	Yes	

Mitigation:	See Section 7 where mitigation is discussed separately

6.4.3 Decommissioning Phase Terrestrial Biodiversity Impacts

The tables below summarise the significance of the decommissioning phase impacts on Terrestrial Biodiversity before and after implementation of mitigation measures.

The fauna and flora would have become accustomed to the changed habitat and the disturbance of this habitat would now result in a further fragmentation. The significance of this impact prior to mitigations were rated as **Moderate** and **Low** after mitigation.

Alien invasive species will flourish in the now newly disturbed areas, and this will need to be monitored quarterly for two years post decommissioning.

Table 23: Assessment of Decommissioning Phase Terrestrial Biodiversity Impacts.

Nature: Continued fragmentation and degradation of habitats and ecosystems		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Significant / ecosystem structure and function moderately altered
Probability	Highly likely	Likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

Nature: Spread and/or establishment of alien and/or invasive species		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Highly likely	Likely
Significance	**Moderate**	**Low**

Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology with limited sensitivity/importance
Can impact be mitigated?	Yes	
Mitigation:	See Section 7 where mitigation is discussed separately	

6.4.4 Cumulative impacts on Terrestrial Biodiversity

Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers. These include dust deposition, noise and vibration, disruption of wildlife corridors or habitat, groundwater drawdown, groundwater and surface water quality, and transport.

Bulskop development area will affect 286 ha of Southern Karoo Riviere vegetation types, through infrastructure placement, however the entire study area will potentially affect 1,471 ha of vegetation. It was demonstrated that this vegetation type is disturbed through land use and well represented in the general area and region, with no species of conservation concern encountered. The facility is situated in the Phase 2 REDZ, and none of the vegetation types within the development area regarded as threatened.

The latest South African Renewable Energy EIA Application (REEA) database contains spatial data for renewable energy applications for environmental authorisation. It includes spatial and attribute information for both active (in process and with valid authorisations) and non-active (lapsed or replaced by amendments) applications.

Taking into account the five additional 120 MW PV facilities planned for the area, the grid connection and also the surrounding developments, the overall cumulative impact is expected to be high.

Figure 59: Assessment of Cumulative Terrestrial Biodiversity Impacts for Bulskop PV

Impact Nature: Loss / Degradation to Local Ecology		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Low	High
Duration	Long term	Long term
Magnitude	Moderate	High
Probability	Probable	Highly probable
Significance	Moderate	High
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

6.4.5 Impacts of the no go alternative on Terrestrial Biodiversity.

The table below summarise the significance of the no go alternative on Terrestrial Biodiversity.

The development area is associated with two vegetation types, both of which are classified as Least Threatened. The plains are prone to extensive lateral surface flow during periodic rainfall events. The overall sensitivity for these areas is determined to be medium. The no-go option is likely to result in the

continued grazing of the development area. The loss in vegetation cover could also contributed to erosion of the area, albeit limited due to the relatively flat topography[39].

Table 24: Impacts of the No-Go Alternative on Terrestrial Biodiversity.

Nature: Destruction, fragmentation and degradation of habitats and ecosystems due to grazing and trampling by livestock		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Not applicable
Duration	Permanent	Not applicable
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Not applicable
Probability	Definite	Not applicable
Significance	**Moderately High**	Not applicable
Status	Negative	Not applicable
Reversibility	Irreversible	Not applicable
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Not applicable
Can impact be mitigated	Not applicable.	
Mitigation:	Not applicable	

Nature: Spread and/or establishment of alien and/or invasive species		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Not applicable
Duration	Permanent	Not applicable
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Not applicable
Probability	Highly likely	Not applicable
Significance	**Moderately High**	Not applicable
Status	Negative	Not applicable
Reversibility	Irreversible	Not applicable
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Not applicable
Can impact be mitigated	Not applicable	
Mitigation:	Not applicable	

[39] Please note that the specialist has assessed the impact no go alternative with and without mitigation. Considering that the no-go alternative would be the option of not continuing with the activity, there is no scope for mitigation on the no go alternative that can be enforced on the current applicant. The assessment reflected in this section therefore only considers the unmitigated impacts.

Nature: Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, hunting, dust, vibration);		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Not applicable
Duration	Permanent	Not applicable
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Not applicable
Probability	Highly likely	Not applicable
Significance	**Moderately High**	Not applicable
Status	Negative	Not applicable
Reversibility	Irreversible	Not applicable
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Not applicable
Can impact be mitigated	Not applicable	
Mitigation:	Not applicable	

Nature: Mortalities and displacements of fauna and flora SCCs.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Not applicable
Duration	Permanent	Not applicable
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Not applicable
Probability	Highly likely	Not applicable
Significance	**Moderately High**	Not applicable
Status	Negative	Not applicable
Reversibility	Irreversible	Not applicable
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Not applicable
Can impact be mitigated	Not applicable	
Mitigation:	Not applicable	

6.4.6 Concluding Statement – Terrestrial Biodiversity Impacts

The Terrestrial Biodiversity Specialist has confirmed that the land within proposed study area has been altered both currently and historically. The Drainage lines, Rocky Ridges, Southern Karoo Riviere and Gamka Shrubland vegetation types, present across the entire study area can be regarded as important, not only within the local landscape, but also regionally; as they are used for habitat, foraging and movement corridors for fauna within a fragmented landscape. All the vegetation types encountered are well represented on a regional scale and the impact to them from this development is not regarded as

a serious negative impact. No protected plant or animal species were encountered on site. Soil disturbance where construction is to take place is regarded as having a potential impact that will take decades to recover from.

Of particular importance here is the Critically Endangered Riverine Rabbit. The Terrestrial Biodiversity Specialist has confirmed that the field assessment of the site indicated that there is minimal suitable habitat for the Riverine Rabbit present within the site as the only drainage lines located within Bulskop development footprint are along with main access road, which are gravelly in nature with limited hydrophytic vegetation or silty banks that provide habitat for this species. The EWT Riverine Rabbit records database indicates that there have not been any historical sightings from the site or immediate surrounds. As such, the site is considered low suitability for this species and an impact on this species is not expected to occur within the site development footprint.

The Bulskop PV development area is in a medium sensitivity area, with only the access road traversing the Very High sensitivity drainage lines. It is evident from the assessment that the area designated as a CBA1 and 2 is in a modified state, with medium functional integrity. The designated CBA areas are not in a natural nor near natural state. Development activities within the medium sensitivity areas can be considered favourably for development with mitigation.

The Terrestrial Biodiversity specialist concluded that no fatal flaws are evident for the proposed project and is of the opinion that the project, may be favourably considered, on condition all prescribed mitigation measures are implemented.

6.5 AVIFAUNAL IMPACTS

An Avifaunal Impact Assessment was undertaken by the Biodiversity Company and is attached in Annexure E2**.** The following has been summarised from this assessment.

6.5.1 Pre Construction Phase Avifaunal Impacts

The impact of disturbance pre-construction was rated as ‘Low’ prior to the mitigation and was ‘Absent’ post mitigation.

Table 25: Assessment of Avifaunal Impacts during the pre construction phase.

Nature: Temporary disturbance of avifauna due to increased human presence and possible use of machinery and/or vehicles.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One month to one year: Short Term	One month to one year: Short Term
Magnitude / Severity	Small / ecosystem structure and function largely unchanged	Small / ecosystem structure and function largely unchanged
Probability	Likely	Possible
Significance	**Low**	**Absent**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology with limited sensitivity/importance	Ecology with limited sensitivity/importance
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.5.2 Construction Phase Avifaunal Impacts

The construction will impact both a CBA1 area as well as a CBA2 area, the CBA was found to be somewhat disturbed therefore the impact was rated as 'Moderately High' pre-mitigation and 'Moderate" post mitigation.

By installing signs and including a toolbox talk regarding environmental awareness during meetings, collection of eggs and poaching can successfully be mitigated. These impacts can then be reduced from 'Moderate' to 'Low'.

Based on the known occurrence of 5 SCCs of which some are likely breeding in the assessment area the pre-mitigation impact was rated as 'Moderately High'. This impact can be mitigated in spite of the displacement of species, their habitat being fragmented/lost, and their breeding success being influenced. This can be reduced to a "Moderate" level if the remaining farm portion is not proposed for development and managed in support of conservation.

Table 26: Assessment of Avifaunal Impacts during the construction phase.

Nature: Habitat Loss (Destroy, fragment and degrade CBA1 and CBA2 habitat, ultimately displacing avifauna)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Life of operation or less than 20 years: Long Term	One year to five years: Medium Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Significant / ecosystem structure and function moderately altered
Probability	Definite	Highly likely
Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Sensory disturbances (e.g. noise, dust, vibrations)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One year to five years: Medium Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Possible
Significance	**Moderate**	**Low**

Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Collection of eggs and poaching		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One month to one year: Short Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Possible
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Roadkill		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Highly likely	Likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Chemical pollution associated with dust suppressants		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m.	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One month to one year: Short Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Highly likely	Highly likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Displacement or death of SCCs.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Significant / ecosystem structure and function moderately altered
Probability	Highly likely	Highly likely
Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.5.3 Operational Phase Avifaunal Impacts

The impact significance of electrocution and collisions were rated as 'Moderately High' prior to mitigations, this was rated based on the large number of risk species known to occur in the area. Implementation of mitigation measures reduced the significance of these impacts to a 'Moderate' level. It cannot be reduced completely as the risk will still persist, the addition of white stripes on the edges of the PV panels and nest proofing will reduce the impact but will not completely remove it.

The impact significance of the fencing was rated as 'Moderately High', based on the high number of species at risk that are present. Implementation of mitigation measures as specified by Birdlife South

Africa (2017) reduced the significance of the impact to a 'Low" level. Even with the implementation of all these mitigations there is still a likelihood that the species would be impacted.

The continued displacement and death of SCCs were rated as "Moderately High" pre-mitigations, the development would still likely disrupt breeding sites and new nest locations could take a number of years to be established. During that time the development will continue to pose a risk of collisions and death of the species. The rating is lowered to "Moderate" based on the minimisation of the habitat loss, and management of the remaining areas not proposed for development.

Table 27: Assessment of Avifaunal Impacts During the operational phase

Nature: Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Regional within 5 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Permanent	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Significant / ecosystem structure and function moderately altered
Probability	Likely	Highly likely
Significance	**Moderate**	**Moderate**
Status	Negative	Negative
Reversibility	Irreversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology moderately sensitive/ /important
Can impact be mitigated	No	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Sensory disturbances (e.g. noise, dust, vibrations)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Collection of eggs and poaching		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One year to five years: Medium Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Possible
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Roadkill		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Likely
Significance	Moderate	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Collisons with PV and associated infrastructure		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Life of operation or less than 20 years: Long Term	One year to five years: Medium Term

Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Great / harmful/ ecosystem structure and function largely altered
Probability	Highly likely	Likely
Significance	Moderately High	Moderate
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology critically sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Electrocution by infrastructure and connections to PV		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Life of operation or less than 20 years: Long Term.	One year to five years: Medium Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered.	Significant / ecosystem structure and function moderately altered
Probability	Highly likely	Possible
Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Chemical pollution associated with measures to keep PV clean		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Possible
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible

Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Fencing of PV site		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Definite	Likely
Significance	**Moderately High**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Displacement or death of SCCs.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	Life of operation or less than 20 years: Long Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Significant / ecosystem structure and function moderately altered
Probability	Highly likely	Highly Likely
Significance	**Moderately High**	**Moderate**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.5.4 Decommissioning Phase Avifaunal Impacts

The habitat will be disturbed again and will need to be rehabilitated post removal of the infrastructure. The impact of habitat loss and disturbance were rated as “Moderate” pre-mitigations and “Low’ post-mitigations.

The removal of the infrastructure and more specifically the solar panels will reduce the impact of collisions from “Moderately” to “Absent”. The risk of fencing becoming slack and causing birds to become entangled is “Moderate”, should this be removed along with all the other infrastructure the impact can successfully be reduced to “Absent”.

Table 28: Assessments of Avifaunal Impacts during the decommissioning phase.

Nature: Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Possible
Significance	Moderate	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology moderately sensitive/ /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Sensory disturbances (e.g. noise, dust, vibrations)		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Development specific/ within the site boundary / < 100 ha impacted / Linear features affected < 100m
Duration	Life of operation or less than 20 years: Long Term	One month to one year: Short Term
Magnitude / Severity	Significant / ecosystem structure and function moderately altered	Small / ecosystem structure and function largely unchanged
Probability	Likely	Likely
Significance	**Moderate**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Roadkil		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Activity specific/ < 5 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One day to one month: Temporary
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Insignificant / ecosystem structure and function unchanged
Probability	Likely	Highly unlikely
Significance	Moderate	Absent
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Collisons with PV and associated infrastructure		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Activity specific/ < 5 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One day to one month: Temporary
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Insignificant / ecosystem structure and function unchanged
Probability	Likely	Highly Unlikely
Significance	Moderate	Absent
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Fencing of PV site, especially a risk for Greater Flamingos		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Activity specific/ < 5 ha impacted / Linear features affected < 100m
Duration	One year to five years: Medium Term	One day to one month: Temporary

Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	Insignificant / ecosystem structure and function unchanged
Probability	Likely	Highly unlikely
Significance	**Moderate**	**Absent**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	Ecology highly sensitive /important
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.5.5 Cumulative Impacts on Avifauna

Cumulative impacts are assessed in context of the extent of the proposed assessment area; other developments in the area; and general habitat loss and transformation resulting from other activities in the area.

Localised cumulative impacts include the cumulative effects from operations that are close enough to potentially cause additive effects on the environment or sensitive receivers (such as nearby solar farm activities within the area). These include dust deposition, noise and vibration, disruption of corridors or habitat.

The six proposed facilities are predominantly located in Southern Karoo Riviere Grassland habitat type, as delineated (and refined) for this assessment. The total footprint area proposed to be developed for the six PV facilities measures 1,471 ha. A total area of the Southern Karoo Riviere Grassland habitat type within the 30 km radius farm portion equates to approximately 52.000 ha of very similar habitat. The total combined size of the footprint taken up by solar facilities equates to 2.8% of similar habitat.

Further to this, considering the number of known and planned PV facilities and the associated powerlines in the area the cumulative impact is expected to be moderate.

Table 29: Assessment of Cumulative Avifaunal Impacts.

Nature: Cumulative Avifaunal Impacts as a result of dust deposition, noise and vibration, disruption of corridors or habitat.		
Extent / Spatial Scope	Within 30km of the site	
Duration	Long Term	
Magnitude / Severity	Great / harmful/ ecosystem structure and function largely altered	
Probability	Probable	
Significance	**Moderate**	
Status	Negative	
Reversibility	Reversible	
Irreplaceable loss of resources / Sensitivity of receiving environment	Ecology highly sensitive /important	
Can impact be mitigated	To a degree	
Mitigation:	See section 7 for required mitigation measures.	

6.5.6 Concluding Statement – Avifauna

The assessment area consisted of four avifauna habitats; Ridges, Karoo Riviere-Shrubland, Karoo Riviere Grassland and Water Resources, these habitats were still mostly in a natural state with the exception of some areas that have been disturbed by livestock grazing.

Five species of conservation concern (SCC), Karoo Korhaan (Eupodotis vigorsii), Blue Crane (Grus paradisea), Lanner Falcon (Falco biarmicus), Sclater's Lark (Spizocorys sclateri) and Ludwigs Bustard (Neotis ludwigii) were confirmed in the assessment area. The Sclater's Lark, Ludwigs Bustard and Karoo Korhaan are all very likely to have nests in the assessment area, they nest on the ground in scraped areas between scrubs or scattered rocks.

The Blue Crane could also possibly nest in the assessment area, but it is less likely, as they tend to nest near water in open veld, the assessment area is some distance away from the closest perennial water source. The Lanner Falcon breeds on cliff ledges it is thus less likely to have a permanent nest in the assessment area. Based on the nesting behaviour and the habitat type in the assessment area, it can be said that three of the five SCCs are permanent residents in the assessment area.

The project will result in habitat loss and degradation of an area where five species of conservation concern are known to occur. Three of which have a very high likelihood of breeding in the assessment area. The development will lead to the clearing of vegetation and an altering in the undeveloped/isolated nature of the area. Based on the low receptor resilience and the high functional integrity, the assessment area was given a high site ecological importance (SEI), with the exception of the water sources that were assigned a very high SEI based on the importance in this dry area.

The 'average' post-mitigation impact significance for the respective phases ranges from low to moderate. The impacts considered could be mitigated to an acceptable level of significance. A total area of the Southern Karoo Riviere Grassland habitat type taken up by solar facilities equates to 2.8% of similar habitat within a 30 km radius. Further to this, considering the number of known and planned PV facilities and the associated powerlines in the area the cumulative impact is expected to be moderate.

The Avifaunal Specialist confirmed that no fatal flaws were identified for the project. Taking into consideration the extent of 'avoidance' and "mitigated" impact significances achieved for the project, it is the opinion of the specialist that the authorisation of the proposed project may be favourably considered and that the prescribed mitigation measures be considered for authorisation

6.6 AGRICULTURAL IMPACTS

Mr Johann Lanz completed a specialist assessment (agricultural compliance Statement[40]) of the potential impacts of Bulskop PV on the agricultural environment. A copy of this assessment is attached in Annexure E3, and the outcome of the assessment is summarised below.

The agricultural specialist identified 3 potential direct negative impacts on agricultural resources:

- **Loss of agricultural potential by occupation of land** - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use, with consequent potential loss of agricultural productivity and employment. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.

[40] An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

- **Loss of agricultural potential by soil degradation** – This impact only becomes relevant once the land is returned to agricultural land use after decommissioning. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact occurs only during the construction and decommissioning phases. Due to the very low slope of the land, the site has a low susceptibility to soil erosion.
- **Dust impact** – The disturbance of the soil surface, particularly during construction, will generate dust that can negatively impact surrounding veld and farm animals.

The specialist furthermore identified one positive agricultural impact:

- **Enhanced agricultural potential through increased financial security for farming operations** - Reliable income will be generated through the lease of the land to the energy facility. This is likely to increase cash flow and financial security of landowners and could improve farming operations and productivity through increased investment into farming.

6.6.1 Assessment of Agricultural Impacts

All agricultural impacts of this proposed development are assessed as being of **low significance.** For the following reasons:

- The proposed development will occupy land that is of very limited land capability and is totally unsuitable for the production of cultivated crops. There is not a scarcity of such agricultural land in South Africa and its conservation for agriculture is not therefore a priority.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.
- The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as wider, societal benefits.

6.6.2 Cumulative agricultural impacts

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. The defining question for assessing the cumulative agricultural impact is this:

There are 6 such other renewable energy projects present in the immediate area that could contribute to cumulative impact.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of these 6 projects plus this one, and the others associated with it (total generation capacity of 1,319 MW) will amount to a total of approximately 3,298 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30km radius (approximately 282,700 ha), this amounts to only 1.17% of the surface area. That is considered to be within an acceptable limit in terms of loss of agricultural land that is only suitable for grazing, of which there is no scarcity in the country.

As discussed above, the risk of a loss of agricultural potential by soil degradation is low and can effectively be mitigated for renewable energy developments. If the risk for each individual development is low, then the cumulative risk is also **low.**

Furthermore, there are no significant other land uses, apart from renewable energy, which are competing for agricultural land in the area, and so the total cumulative loss of agricultural land from all competing land uses is not significantly higher than what has been considered above.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use **will not have an unacceptable negative impact on the agricultural production** capability of the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

6.6.3 Concluding Statement - Agriculture

The agricultural specialist has concluded that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. As such, from an agricultural impact point of view, it is recommended that the development be approved.

6.7 HERITAGE IMPACTS

A detailed Heritage Impact Assessment including and Archaeological Impact Assessment, Cultural Heritage Impact Assessment and Palaeontology Impacts Assessment was undertaken Ms Jenna Lavin of CTS Heritage (with input from Dr John Almond on Palaeontology). A copy of these assessments are attached in Annexures E4, E5, E6 and E7 and the outcome of the various assessments are summarised below.

6.7.1 Impacts on Cultural Landscape

The Cultural Landscape Assessment identified the R61 as having some cultural value as a linking route through the flat Karoo landscape.

The PV facility is located ~1.5 km to the east of the R61 at the nearest point and is located within a 'sand pan area' where a slight change in topography will provide visual screening.

The project will have minimal impact on the Karoo National Park and associated escarpment due to distance, the location of the Beaufort West in between the project and Park and the existing infrastructural corridor as a dominant visual component in this immediate landscape.

No negative impact to any cultural landscape resources of heritage value are anticipated given the low heritage significance of the landscape directly affected by the project and the low impact on the broader landscape context.

6.7.2 Impacts on Archaeology Resources

The proposed development **will not have a negative impact** on the archaeological resources identified within the proposed development area for the PV facility. The majority of the lithic material identified is of low significance (not conservation-worthy), and even though the resources may be destroyed during construction, the impact is insignificant.

Only one archaeological resource of contextual significance was identified (BLK030). This site has been sufficiently recorded and no further mitigation is recommended. Furthermore, no impact to this site is anticipated as it is located well away from the Bulskop PV development footprint.

6.7.3 Impact on Palaeontology Resources

No fossils of any sort- were recorded within the PV footprint.

Bulskop PV facility is of LOW paleo sensitivity and no impact to significant palaeontological heritage resources is anticipated.

6.7.4 Cumulative Heritage Impacts

At this stage, there is the potential for the cumulative impact of proposed renewable energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial. Based on the available information, a number of renewable energy facilities have been approved in the immediate vicinity of the proposed development, as well as presently proposed for this immediate environment.

While the cumulative impacts associated with this proposed development are therefore likely to be **high**, it is noted that it is preferable to have renewable energy facility development focussed in an area such as a REDZ.

6.7.5 Concluding Statement - Heritage

Based on the outcome of the heritage assessment, the proposed development is not anticipated to have a significant negative impact on heritage resources and as such, the anticipated socio-economic benefits to be derived from this project outweigh the anticipated negative impacts to heritage resources.

6.8 VISUAL IMPACTS

Mr Steven Stead of Visual Resource Management Africa (VRMA) undertook a detailed visual impact assessment of the proposed Bulskop PV. A copy of this assessment is attached in Annexure E8 of the BAR and a summary outcome thereof is provided below.

6.8.1 Construction Phase Visual Impacts

The Visual specialist considered and assessed the following visual impacts associated with the construction phase of the development:

- Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure.
- Wind-blown dust due to the removal of large areas of vegetation.
- Possible soil erosion from temporary roads crossing drainage lines.
- Wind-blown litter from the laydown and construction sites.

Table 30: Assessment of Visual Impacts during the construction phase.

Nature: Construction Phase Visual Impacts Associated with: - Loss of site landscape character due to the removal of vegetation and the construction of the PV structures and associated infrastructure. - Wind-blown dust due to the removal of large areas of vegetation. - Possible soil erosion from temporary roads crossing drainage lines. - Wind-blown litter from the laydown and construction sites.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Short Term	Short Term
Magnitude / Severity	Medium	Low
Probability	Probable	Probable
Significance	**Medium**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	

Mitigation:	See Section 7 for required mitigation measures

6.8.2 Operational Phase Visual Impacts

The Visual specialist considered and assessed the following visual impacts associated with the operational phase of the development:

- Massing effect in the landscape from a large-scale modification.
- On-going soil erosion.
- On-going windblown dust.

Table 31: Assessment of Visual Impacts during the Operational phase.

Nature: Operational Visual Impacts Associated with": - Massing effect in the landscape from a large-scale modification. - On-going soil erosion. - On-going windblown dust		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Long Term	Long Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Medium - High	Medium - High
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Not effectively. However impact will occur within a REDZ where visual massing on the landscape is likely over the long-term	
Mitigation:	See section 7 for required mitigation measures.	

6.8.3 Decommissioning Phase Visual Impacts

The Visual specialist considered and assessed the following visual impacts associated with the decommissioning phase of the development:

- Movement of vehicles and associated dust.
- Wind-blown dust from the disturbance of cover vegetation / gravel.

Table 32: Assessment of Visual Impacts during the decommissioning phase.

Nature: Decommissioning Visual Impacts Associated with: - Movement of vehicles and associated dust. - Wind-blown dust from the disturbance of cover vegetation / gravel.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Short Term	Short Term

Magnitude / Severity	Medium	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.8.4 Cumulative Visual Impacts

The Visual specialist considered and assessed the following cumulative visual impacts of the development:

- A long-term change in land use setting a precedent for other similar types of solar energy projects.

Table 33: Assessment of cumulative Visual Impacts.

Nature: Cumulative visual impacts associated with a long-term change in land use setting a precedent for other similar types of solar energy projects.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Long Term	Long Term
Magnitude / Severity	Medium	Medium
Probability	Probable	Probable
Significance	Medium	Medium
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	No	
Mitigation:	See section 7 for required mitigation measures.	

6.8.5 Concluding Statement – Visual

The visual specialist concluded that the proposed PV project should be authorised with Mitigation, due to the following reasons:

- The site visual resources are limited with a Low rating for Scenic Quality and Medium rating for Receptor Sensitivity to landscape change.
- Regionally, the viewshed is contained to some degree from topographic screening.
- The predominantly flat terrain, result in receptor views having similar height and as such, the outside areas of the PV landscape modification will be mainly visible with the massing effects

from the combined views of all the PV projects limited. The exception is Steenbokkie PNR, were there is a small ridgeline that would afford some 3D views, but at a distance.

- While the adjacent Steenbokkie PNR does fall within the property ZVI, the accommodation centre is topographically screened, views from the main ridgeline viewpoint are 5.3km distance, and the western portions of the have limited visual exposure. The central areas (closest to the PV site) are strongly associated with Eskom transmission line power lines.
- National energy objectives for renewable energy and job creation will be met with the site located within the REDZ11 area and there is a good alignment with regional and local planning.

Mitigation is required and would need to be implemented. With mitigation, the benefits of the PV related landscape change are likely to outweigh the landscape status quo, where scenic resources are limited. The area falls with the Beaufort West REDZ, and there is a strong alignment to the planning.

6.9 AQUATIC BIODIVERSITY IMPACTS

An Aquatic Biodiversity Impact Assessment was undertaken by the Biodiversity Company and is attached in Annexure E1.

6.9.1 Construction Phase Aquatic Biodiversity Impacts

The construction phase impacts identified by the Aquatic Biodiversity Specialist were considered to be:

- Impacts on Habitat integrity & Sediment balance from clearing associated with construction of roads and laydown yards
- Impacts on Flow dynamics from construction of stormwater management infrastructure around the PV Area
- Impacts on Water quality from contamination due to improper storage of chemicals, construction materials, fuel and machinery leaks
- Impacts of Rehabilitation Activities

The specialist undertook the assessment in accordance with the requirements of the published General Notice (GN) 509 by the Department of Water and Sanitation (DWS). This notice was published in the Government Gazette (no. 40229) under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016, for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 509 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application (WULA). A water use (or potential) qualifies for a GA under GN 509 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM). A copy of the full Risk Assessment Matrix is included in Table 8-11 of he Aquatic Biodiversity Assessment (Appendix E1) The following assessment on the impacts on Aquatic Biodiversity has been adapted from this Risk Assessment Matrix.

Table 34: Assessment of Aquatic Biodiversity Impacts during the Construction Phase.

Nature: Impacts on Habitat integrity & Sediment balance from clearing associated with construction of roads and laydown yards		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore >	Habitat that can recover relatively quickly (~ 5–10 years) to restore >

	75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Probable	Unlikely
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts on Flow dynamics from construction of stormwater management infrastructure around the PV Area		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Probable	Probable
Significance	**Medium**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts on Water quality from contamination due to improper storage of chemicals, construction materials, fuel and machinery leaks.

	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Probable	Unlikely
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts of Rehabilitation Activities associated with Indiscriminate dumping of rubble and construction material, Improper re-establishment of flow paths, increased sedimentation and Increased erosion from exposed surfaces.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Probable	Probable
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible

Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

6.9.2 Operational Phase Aquatic Biodiversity Impacts

The operational phase impacts identified by the Aquatic Biodiversity Specialist were considered to be:

- Impacts on Flow dynamics & Stormwater management due to increased hard surfaces from solar panels, roads and stormwater infrastructure.
- Impacts on Flow dynamics & Stormwater management due to reduced vegetation on ground as a result of decreased light penetration.
- Increased traffic and human disturbance.
- Establishment of alien plants on disturbed areas.
- Impacts on Water quality due to Contamination, dumping of solid wastes and input associated with surface runoff from roads

The specialist undertook the assessment in accordance with the requirements of the published General Notice (GN) 509 by the Department of Water and Sanitation (DWS). This notice was published in the Government Gazette (no. 40229) under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016, for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 509 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application (WULA). A water use (or potential) qualifies for a GA under GN 509 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM). A copy of the full Risk Assessment Matrix is included in Table 8-11 of he Aquatic Biodiversity Assessment (Appendix E1) The following assessment on the impacts on Aquatic Biodiversity has been adapted from this Risk Assessment Matrix.

Table 35: Assessment of Aquatic Impacts during the Operational Phase

Nature: Impacts on Flow dynamics & Stormwater management due to increased hard surfaces from solar panels, roads and stormwater infrastructure.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Likely	Highly Likely
Significance	**Medium**	**Low**

Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts on Flow dynamics & Stormwater management due to reduced vegetation on ground as a result of decreased light penetration		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Likely	Possible
Significance	**Medium**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Increased traffic and human disturbance		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at

	a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Likely	Likely
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Establishment of alien plants on disturbed areas.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Likely	Possible
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts on Water quality due to Contamination, dumping of solid wastes and input associated with surface runoff from roads		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m

Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Likely	Possible
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

6.9.3 Decommissioning and Closure Phase Aquatic Biodiversity Impacts

The decommissioning impacts are related to the removal of all infrastructure after the period of the Power Purchase Agreement. The decommissioning impacts in this instance are deemed to be similar to the construction phase impacts and include:

- Impacts on Habitat integrity & Sediment balance from clearing associated with the removal of roads and laydown yards
- Impacts on Flow dynamics from removal of stormwater management infrastructure around the PV Area
- Impacts on Water quality from contamination due to improper storage of chemicals, construction materials, fuel and machinery leaks
- Impacts of Rehabilitation Activities

The specialist undertook the assessment in accordance with the requirements of the published General Notice (GN) 509 by the Department of Water and Sanitation (DWS). This notice was published in the Government Gazette (no. 40229) under Section 39 of the National Water Act (Act no. 36 of 1998) in August 2016, for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 509 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application (WULA). A water use (or potential) qualifies for a GA under GN 509 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM). A copy of the full Risk Assessment Matrix is included in Table 8-11 of he Aquatic Biodiversity Assessment (Appendix E1) The following assessment on the impacts on Aquatic Biodiversity has been adapted from this Risk Assessment Matrix.

Table 36: Assessment of Aquatic Biodiversity Risks during the decommissioning phase.

Nature: Impacts on Habitat integrity & Sediment balance from clearing associated with decomisioning of roads and laydown yards

	Without Mitigation	With Mitigation
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Probable	Unlikely
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts on Flow dynamics from decommissioning of stormwater management infrastructure around the PV Area		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Highly Probable	Probable
Significance	**Medium**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity

Can impact be mitigated	Yes
Mitigation:	See section 7 for required mitigation measures.

Nature: Impacts on Water quality from contamination due to improper storage of chemicals, construction materials, fuel and machinery leaks.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.
Probability	Probable	Unlikely
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Impacts of Rehabilitation Activities associated with Indiscriminate dumping of rubble and construction material, Improper re-establishment of flow paths, increased sedimentation and Increased erosion from exposed surfaces.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m	Local area/ within 1 km of the site boundary / < 5000ha impacted / Linear features affected < 1000m
Duration	Short Term – During Construction	Short Term – During Construction
Receptor Resilience	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of remaining at a site even when a disturbance or impact is occurring, or species that have a high likelihood of returning to a site once the disturbance or impact has been removed.

Probability	Highly Probable	Probable
Significance	**Low**	**Low**
Status	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources / Sensitivity of receiving environment	Medium Sensitivity	Medium Sensitivity
Can impact be mitigated	yes	
Mitigation:	See section 7 for required mitigation measures.	

6.9.4 Concluding Statement – Aquatic Biodiversity.

The specialist has confirmed that no drainage lines or rivers are located within the development area, but drainage lines are associated with the access road.

Modifications to the ephemeral systems were observed across the study area, attributed to overgrazing and bush clearing for firewood. The plain drains north into the Platdoring River, which is rated as moderate Ecological Importance and Sensitivity, with most taxa being resilient to low flow conditions and flooding. The plain was rated as medium sensitivity. It has been recommended that effective stormwater management be implemented to reduce erosion within the development area and in downstream reaches.

Proposed activities associated with the access route will disturb these areas through direct impacts during construction activities, with impacts extending into the latter phases of the project. During the operational phase, indirect impacts from the solar facility due to stormwater runoff from hard surfaces may result in erosion of channels, and sedimentation of downstream systems. The study area was classified as medium sensitivity; however, the plain and downstream water resources may be susceptible to changes in hydrology. All prescribed mitigation measures must be implemented, and stormwater must be effectively managed for the development area. Due to the expected low post-mitigation risks, a General Authorisation is permissible for the development.

6.10 SOCIAL IMPACTS

Mr Tony Barbour undertook a Social Impact Assessment of the proposed Bulskop PV. A copy of this assessment is included in **Annexure E9,** and the following summary is provided in this regard.

The social specialist divided his assessment into the following sections which are discussed separately below.

- Assessment of compatibility with relevant policy and planning context;
- Assessment of social issues associated with the construction phase;
- Assessment of social issues associated with the operational phase;
- Assessment of social issues associated with the decommissioning phase;
- Assessment of the no go alternative; and
- Assessment of cumulative impacts.

6.10.1 Assessment of social impacts associated with policy and planning.

The findings of the review indicate that renewable energy is strongly supported at a national, provincial, and local level. At a national level the development of and investment in renewable energy is supported by the National Development Plan, New Growth Path Framework and National Infrastructure Plan, which

all refer to renewable energy. Renewable energy is also supported at a provincial and local municipal level. The proposed site is also located within the Beaufort West REDZ. The area has therefore been identified as suitable for the establishment of large-scale solar energy facilities and associated infrastructure. The Beaufort West Municipality IDP and SDF also support the development of renewable energy.

6.10.2 Assessment of social impacts associated with the construction phase

The social specialist identified both positive and negative impacts associated with the construction phase, these impacts were identified as follows:

- Creation of employment and business opportunities, and opportunity for skills development and on-site training (Positive Impact);
- Impacts associated with the presence of construction workers on local communities;
- Impacts related to the potential influx of jobseekers;
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site;
- Increased risk of grass fires associated with construction related activities;
- Noise, dust and safety impacts of construction related activities and vehicles; and
- Impact on productive farmland.

An assessment of these identified social impacts during construction are included in the tables below.

Table 37: Assessment of positive social impacts during the construction phase

Nature: Creation of employment and business opportunities during the construction phase		
	Without Mitigation	**With Enhancement**
Extent	Local – Regional	Local – Regional
Duration	Short term	Short term
Magnitude	Moderate	High
Probability	Highly probable	Highly probable
Significance	Medium	Medium
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impact be enhanced?	Yes	
Enhancement:	see section 7 of the BAR dealing with suggested mitigation measures	
Cumulative impacts:	Opportunity to up-grade and improve skills levels in the area.	
Residual impacts:	Improved pool of skills and experience in the local area.	

Table 38: Assessment of negative social impacts during the construction phase

Nature: Potential impacts on family structures and social networks associated with the presence of construction workers		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Short term for community as a whole	Short term for community as a whole
Magnitude	Moderate for the community as a whole	Low for community as a whole

Probability	Probable	Probable
Significance	Medium for the community as a whole	Low for the community as a whole (
Status	Negative	Negative
Reversibility	Irreversible in case of HIV and AIDS	Irreversible in case of HIV and AIDS in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation:	See mitigation measures reflected in section 7 of the BAR.	
Cumulative impacts:	Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long term to permanent cumulative impacts on the affected individuals and/or their families and the community.	
Residual impacts:	Same as cumulative impacts assessed above	
Assessment of No-Go option	There is no impact as the current status quo would be maintained. The potential positive impacts on the local economy associated with the additional spending by construction workers in the local economy will also be lost.	

Nature: Potential impacts on family structures, social networks and community services associated with the influx of job seekers		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Permanent (For job seekers that stay on the town)	Permanent (For job seekers that stay on the town)
Magnitude	Minor	Minor
Probability	Probable	Probable
Significance	Low	Low
Status	Negative	Negative
Reversibility	Irreversible in case of HIV and AIDS in case of HIV and AIDS	Irreversible in case of HIV and AIDS in case of HIV and AIDS
Irreplaceable loss of resources?	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods	Yes, if people contract HIV/AIDS. Human capital plays a critical role in communities that rely on farming for their livelihoods
Can impact be mitigated?	Yes, to some degree. However, the risk cannot be eliminated	
Mitigation:	See section 7 of the BAR for a summary of the mitigation measures.	
Cumulative impacts:	Impacts on family and community relations that may, in some cases, persist for a long period of time. Also, in cases where unplanned / unwanted pregnancies occur or members of the community are infected by an STD, specifically HIV and or AIDS, the impacts may be permanent and have long	

	term to permanent cumulative impacts on the affected individuals and/or their families and the community.
Residual impacts:	Same as cumulative impacts assessed above
Assessment of No-Go option	There is no impact as it maintains the current status quo.

Nature: Potential risk to safety of scholars, farmers and farm workers, livestock and damage to farm infrastructure associated with the presence of construction workers on site		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Short term	Short term
Magnitude	Medium	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible , compensation paid for stock losses and damage to farm infrastructure etc.	reversible, compensation paid for stock losses and damage to farm infrastructure etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	See section 7 of the BAR for a summary of the Mitigation Measures.	
Cumulative impacts:	No**,** provided losses are compensated for.	
Residual impacts:	See cumulative impacts above.	
Assessment of No-Go option	There is no impact as it maintains the current status quo.	

Nature: Potential loss of livestock, crops and houses, damage to farm infrastructure and threat to human life associated with increased incidence of grass fires		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Short term	short term
Magnitude	Moderate due to reliance on agriculture for maintaining livelihoods	Low
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible, compensation paid for stock and crop losses etc.	reversible, compensation paid for stock and crop losses etc.
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	See section 7 of the BAR for a summary of mitigation measures.	
Cumulative impacts:	No, provided losses are compensated for.	

Residual impacts:	See cumulative impacts.
Assessment of No-Go option	There is no impact as it maintains the current status quo.

Nature: Potential noise, dust and safety impacts associated with movement of construction related traffic to and from the site		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Short Term	Short Term
Magnitude	Medium	Minor
Probability	Probable	Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible	reversible
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	See section 7 of the BAR for a summary of Mitigation measures	
Cumulative impacts:	If damage to local farm roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were not responsible for the damage. .	
Residual impacts:	See cumulative impacts above.	
Assessment of No-Go option	There is no impact as it maintains the current status quo.	

Nature: The activities associated with the construction phase, such as establishment of access roads and the construction camp, movement of heavy vehicles and preparation of foundations for the PV Development and power lines will damage farmlands and result in a loss of farmlands for grazing.		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Long term-permanent if disturbed areas are not effectively rehabilitated	Short term if damaged areas are rehabilitated
Magnitude	Medium	Minor
Probability	Probable	Highly Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible, disturbed areas can be rehabilitated.	reversible, disturbed areas can be rehabilitated.
Irreplaceable loss of resources?	Yes, loss of farmland. However, disturbed areas can be rehabilitated	Yes, loss of farmland. However, disturbed areas can be rehabilitated
Can impact be mitigated?	Yes, however, loss of farmland cannot be avoided	
Mitigation:	See below	

Cumulative impacts:	Overall loss of farmland could affect the livelihoods of the affected farmers, their families, and the workers on the farms and their families. However, disturbed areas can be rehabilitated.
Residual impacts:	See cumulative impacts.
Assessment of No-Go option	There is no impact as it maintains the current status quo.

6.10.3 Assessment of social Impacts Associated with the operational phase.

The social specialist identified both positive and negative impacts associated with the operational phase of the development, these impacts were identified as follows:

- The establishment of renewable energy infrastructure (positive);
- Creation of employment and business opportunities. The operational phase will also create opportunities for skills development and training (positive);
- Generation of additional income for the landowner (positive);
- Benefits associated with the establishment of a Community Trust (positive);
- The visual impacts and associated impact on sense of place; and
- Potential impact on tourism.

An assessment of both these positive and negative impacts are included in the tables below.

Table 39: Assessment of positive social impacts during the operational phase.

Nature: Development of infrastructure to generate clean, renewable energy		
	Without Mitigation	**With Mitigation**
Extent	Local, Regional and National	Local, Regional and National
Duration	Long term	Long term
Magnitude	High	High
Probability	Highly Probable	Definite
Significance	High	High
Status	Positive	Positive
Reversibility	reversible	
Irreplaceable loss of resources?	Yes, impact of climate change on ecosystems	Reduced CO_2 emissions and impact on climate change
Can impact be mitigated?	Yes	
Enhancement:	See section 7 of the BAR for a summary of mitigation measures (these measures include the relative enhancement opportunities	
Cumulative impacts:	Overall reduction in CO_2 emission, reduction in water consumption for energy generation, contribution to establishing an economically viable commercial renewables generation sector in the Western Cape and South Africa.	
Residual impacts:	See cumulative impacts above	
Assessment of No-Go option	The No-Development option would represent a lost opportunity for South Africa to supplement its current energy needs with clean, renewable energy.	

Nature: Creation of employment and business opportunities associated with the operational phase		
	Without Mitigation	**With Enhancement**
Extent	Local and Regional	Local and Regional
Duration	Long term	Long term

Magnitude	Low	Low
Probability	Probable	Definite
Significance	Low	Medium
Status	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Enhancement:	See section 7 of the BAR for a summary of mitigation measures (these measures include the relative enhancement opportunities	
Cumulative impacts:	Creation of permanent employment and skills and development opportunities for members from the local community and creation of additional business and economic opportunities in the area	
Residual impacts:	See cumulative impacts above	
Assessment of No-Go option	There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the loss of employment and skills and development training would be lost.	

Nature: Establishment of a community trust funded by revenue generated from the sale of energy. The revenue can be used to fund local community development		
	Without Mitigation	**With Enhancement**
Extent	Local and Regional	Local and Regional
Duration	Long term	Long term
Intensity	Low	Moderate
Likelihood	Probable	Definite
Significance	Medium	High
Status	Positive	Positive
Reversibility	reversible	reversible
Can impact be enhanced?	Yes	
Enhancement:	See section 7 of the BAR for a summary of mitigation measures (these measures include the relative enhancement opportunities	
Cumulative impacts:	Promotion of social and economic development and improvement in the overall well-being of the community	
Residual impacts:	See cumulative impacts	
Assessment of No-Go option	There is no impact as it maintains the current status quo. However, the potential opportunity costs in terms of the supporting the social and economic development in the area would be lost. This would also represent a negative impact.	

Nature: The generation of additional income represents a significant benefit for the local affected farmer(s) and reduces the risks to their livelihoods posed by droughts and fluctuating market prices for sheep and farming inputs, such as feed etc. (+)		
	Without Mitigation	**With Enhancement**
Extent	Local	Local
Duration	Long term	Long term

Intensity	Low	Moderate
Likelihood	Probable	Definite
Significance	Low	Medium (
Status	Positive	Positive
Reversibility	reversible	reversible
Can impact be enhanced?	Yes	
Enhancement:	See section 7 of the BAR for a summary of mitigation measures (these measures include the relative enhancement opportunities	
Cumulative impacts:	Support for local agricultural sector and farming	
Residual impacts:	See cumulative impacts	
assessment of No-Go option	There is no impact as it maintains the current status quo.	

Table 40: Assessment of negative social impacts during the operational phase of the development.

Nature: [41]Visual impact associated with the proposed solar facility and the potential impact on the area's rural sense of place.		
	Without Mitigation	**With Mitigation**
Extent	Local	Local
Duration	Long term	Long term
Magnitude	Minor	Minor
Probability	Probable	Highly Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible, solar facility can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	See section 7 of the BAR for a summary of the suggested mitigation measures.	
Cumulative impacts:	Potential impact on current rural sense of place	
Residual impacts:	See cumulative impacts	
Assessment of No-Go option	There is no impact as it maintains the current status quo.	

Nature: Potential impact of the PV Development on local tourism		
	Without Mitigation	**With Enhancement / Mitigation**
Extent	Local	Local
Duration	Long term	Long term
Magnitude	Low	Low
Probability	Probable	Probable
Significance	Low (Applies to both – and +)	Low (Applies to both – and +)

[41] This assessment includes visual impacts from a social perspective. Please also refer to the detailed standalone Visual Impact Assessment that was undertaken.

Status	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)	Negative (Potential to distract from the tourist experience of the area) Positive (Potential to attract people to the area)
Reversibility	reversible	reversible
Irreplaceable loss of resources?	No	No
Can impact be enhanced?	Yes	
Enhancement:	See section 7 of the BAR for a summary of mitigation measures (including opportunities for enhancement	
Residual impacts:	See cumulative impacts	
Assessment of No-Go option	There is no impact as it maintains the current status quo.	

6.10.4 Assessment of social impacts associated with the decommissioning phase

The social specialist identified negative impacts associated with loss of jobs after the decommissioning of the development. These impacts are assessed in the table below.

Table 41: Assessment of social Impacts associated with the decommissioning of the facility.

Nature: Social impacts associated with retrenchment including loss of jobs, and source of income		
	Without Mitigation	**With Mitigation**
Extent	Local and regional	Local and regional
Duration	Medium Term	Very Short Term
Magnitude	Moderate	Lo
Probability	Highly Probable	Highly Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible, assumes retrenchment packages are paid to all affected employees	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	
Mitigation:	See section 7 of the BAR for a summary of the suggested mitigation measures.	
Cumulative impacts:	Loss of jobs and associated loss of income etc. can impact on the local economy and other businesses. However, decommissioning can also create short term, temporary employment opportunities associated with dismantling etc.	
Residual impacts:	See cumulative impacts	

6.10.5 Assessment of Cumulative Social Impacts.

The social specialist has assessed various cumulative impacts, including:

- Cumulative Impact on Sense of Place
- Cumulative Impact on Local Services and Accommodation
- Cumulative impact on local Economy.

These are discussed and assessed separately in the subsections below.

6.10.5.1 Cumulative Impact on Sense of Place

Based on the information contained in the South African Renewable Energy EIA Application Database there are five renewable energy facilities currently proposed within a 35 km radius of the Bulskop PV facility site. The potential for cumulative impacts associated with combined visibility (whether two or more solar facilities will be visible from one location) and sequential visibility (e.g., the effect of seeing two or more solar facilities along a single journey, specifically the N1 and N12), therefore exists. However, the site is located within the Beaufort West REDZ. The area has therefore been identified as suitable for the establishing of large-scale renewable energy facilities.

Table 42: Assessment of Cumulative impacts on sense of place and the landscape.

Nature: Visual impacts associated with the establishment of more than one PV project and the potential impact on the area's rural sense of place and character of the landscape.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local	Local and regional (2)
Duration	Long term	Long term (4)
Magnitude	Low	Low (4)
Probability	Probable	Probable (3)
Significance	Low	Medium (30)
Status (positive/negative)	Negative	Negative
Reversibility	reversible. Solar energy plant components and other infrastructure can be removed.	
Loss of resources?	No	No
Can impacts be mitigated?	Yes	
Confidence in findings:	High	

6.10.5.2 Cumulative Impact on Local Services and Accommodation

The establishment of the proposed Bulskop PV facility and the other renewable energy facilities in the Beaufort West Municipality has the potential to place pressure on local services in nearby towns, specifically Beaufort West. Services affected include medical, education and accommodation. This pressure will be associated with the influx of workers to the area associated with the construction phases, and to a lesser extent, the operational phases.

The potential impact on local services can be mitigated by employing local community members. However, due to the low education and skills levels in the area there is likely to be a need to implement a training and skills development programme to ensure that local employment opportunities are maximised, specifically during the construction phase. The presence of non-local workers during both the construction and operation phase may also place pressure on property prices and rentals. As a result, local residents, such as government officials, such as municipal workers, schoolteachers, and the police, may no longer be able to buy or afford to rent accommodation in Beaufort West and other towns in the Beaufort West Municipality.

However, as indicated below, this impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of a renewable projects in the area. These benefits will create opportunities for investment in the Beaufort West Municipality, including the opportunity to up-grade and expand existing services.

The Community Trusts associated with each project will generate revenue that can be used by the Beaufort West Municipality, in consultation with the Western Cape Provincial Government, to invest in up-grading local services where required. In should also be noted that it is the function of national, provincial, and local government to address the needs created by economic development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the Beaufort West Municipality.

Table 43: Cumulative impacts on local services

Nature: The establishment of a number of renewable energy facilities in the Beaufort West Municipality has the potential to place pressure on local services, specifically medical, education and accommodation		
	Without Mitigation	**With Mitigation[42]**
Extent	Local and regional	Local and regional
Duration	Long term	Long term
Magnitude	Moderate	Minor
Probability	Highly Probable	Highly Probable
Significance	Medium	Low
Status	Negative	Negative
Reversibility	reversible. Solar energy plant components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	No
Can impact be mitigated?	Yes	

6.10.5.3 Cumulative Impact on Local Economy

In addition to the potential negative impacts, the proposed Bulskop PV facility also has the potential to create significant positive cumulative impacts. In this regard the establishment of a number of SEFs in the area will create socio-economic opportunities for the Beaufort West Municipality, which, in turn, will result in positive social benefits. The positive cumulative impacts include the creation of employment, skills development and training opportunities, and downstream business opportunities.

The potential cumulative benefits for the local and regional economy are therefore associated with both the construction and operational phase of renewable energy projects and extend over a period of 20-25 years.

Table 44: Cumulative impacts on local economy

Nature: The establishment of a number of solar energy facilities in the Beaufort West Municipality will create employment, skills development and training opportunities, creation of downstream business opportunities.		
	Without Mitigation	**With Mitigation**
Extent	Local and regional	Local and regional
Duration	Long term	Long term
Magnitude	Low	Moderate
Probability	Highly Probable	Definite
Significance	Medium	High
Status	Positive	Positive
Reversibility	reversible. Solar energy plant components and other infrastructure can be removed.	
Irreplaceable loss of resources?	No	No

[42] The mitigation measures are linked to initiatives undertaken by Provincial and Local Government to address the additional demand for services and accommodation etc. created by the establishment of development renewable energy projects in the Beaufort West REDZ.

Can impact be mitigated?	Yes
Residual impacts: Positive impact on the local and regional economy through the creation of downstream opportunities and wage spend in the local economy	

6.10.6 Assessment of social impacts of the no-go alternative.

The social specialist assessed the impacts associated with lost opportunities, should the no-go alternative be implemented. The outcome of this assessment is included in the table below.

Table 45: Assessment of social impacts associated with the no-go alternative.

Nature: The no-development option would result in the lost opportunity for South Africa to supplement is current energy needs with clean, renewable energy		
	Without Mitigation	**With Mitigation**
Extent	Local-International	Local-International
Duration	Long term	Long term
Magnitude	Moderate	Moderate
Probability	Highly Probable	Highly Probable
Significance	Moderate	Moderate
Status	Negative	Positive
Reversibility	reversible	
Irreplaceable loss of resources?	N/A	N/A
Can impact be mitigated?	Yes	
Cumulative impacts:	Reduce carbon emissions via the use of renewable energy and associated benefits in terms of global warming and climate change	
Residual impacts:	See cumulative impacts	

6.10.7 Concluding Statement - Social

The findings of the SIA indicate that the development of the proposed 120 MW Bulskop PV facility will create employment and business opportunities for locals in the Beaufort West Municipality during both the construction and operational phase of the project.

The establishment of a Community Trust will also benefit the local community. The enhancement measures listed in the report should be implemented in order to maximise the potential benefits. The significance of this impact is rated as High Positive. The proposed development also represents an investment in clean, renewable energy infrastructure, which, given the negative environmental and socio-economic impacts associated a coal-based energy economy and the challenges created by climate change, represents a significant positive social benefit for society as a whole. The findings of the SIA also indicate that the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) has resulted in significant socio-economic benefits, both at a national level and at a local, community level. These benefits are linked to foreign Direct Investment, local employment and procurement and investment in local community initiatives. The establishment of the proposed 120 MW Bulskop PV project is therefore supported by the findings of the SIA.

The enhancement and mitigation measures outlined in the SIA and other key specialist reports should be implemented in order to achieve the overall social desirability of the project.

6.11 TRAFFIC IMPACTS

JG Afrika undertook a Traffic Impact Assessment of the proposed Bulskop PV. A copy of this assessment is included in **Annexure E13,** and the following summary is provided in this regard.

6.11.1 Construction Phase Traffic Impacts

Table 46: Assessment of Construction Phase Traffic Impacts

Nature: Transport of equipment, material and staff to site that leads to traffic congestion.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Low
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No loss	No Loss
Reversibility	Completely reversible	
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Traffic on roads will generate dust.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	Completely reversible
Mitigation:	See section 7 for required mitigation measures.	

Nature: Noise pollution due to increased traffic.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable

Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	
Mitigation:	See section 7 for required mitigation measures.	

6.11.2 Operational Phase Traffic Impacts

The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.

6.11.3 Decommissioning Phase Traffic Impacts

Table 47: Assessment of Decommissioning Phase Traffic Impacts

Nature: Transport of equipment, material and staff to site that leads to traffic congestion.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Low
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No loss	No Loss
Reversibility	Completely reversible	Completely reversible
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

Nature: Traffic on roads will generate dust.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	Medium	Low
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	Completely reversible

Mitigation:	See section 7 for required mitigation measures.

Nature: Noise pollution due to increased traffic.		
	Without Mitigation	**With Mitigation**
Extent / Spatial Scope	Local	Local
Duration	Very Short	Very Short
Magnitude / Severity	Moderate	Minor
Probability	Highly probable	Improbable
Significance	**Medium**	**Low**
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	None	None
Can impact be mitigated	Yes	
Reversibility	Completely reversible	
Mitigation:	See section 7 for required mitigation measures.	

6.11.4 Cumulative Traffic Impacts

Table 48: Assessment of Cumulative Traffic Impacts

Nature: Traffic generated by the proposed development and the associated noise and dust pollution		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent / Spatial Scope	Low	Moderate
Duration	Very Short	Short
Magnitude / Severity	Moderate	Moderate
Probability	Highly probable	Definite
Significance	Medium	Medium
Status	Negative	Negative
Irreplaceable loss of resources / Sensitivity of receiving environment	No	No
Reversibility	reversible	reversible
Can impact be mitigated	Yes	
Mitigation:	See section 7 for required mitigation measures.	

6.11.5 Concluding Statement – Traffic

The construction and decommissioning phases of a development is the only significant traffic generator and therefore noise and dust pollution will be higher during this phase. The duration of this phase is short term i.e. the impact of the traffic on the surrounding road network is temporary and solar farm, when operational, does not add any significant traffic to the road network.

The proposed access point and the access road to the facility are deemed feasible from a traffic engineering perspective.

The impacts associated with the proposed Bulskop PV Facility are acceptable with the implementation of the recommended mitigation measures and can therefore be authorised.

6.12 CUMULATIVE IMPACT ASSESSMENT

This section is summarised from the cumulative impact assessments that took place by each of the participating specialists. For further details in this regard, the reader is referred to the specialist assessments contained in **Appendix E**.

Where appropriate, certain specialists did include a cumulative assessment of a much wider area than the accepted 30km radius.

The 2014 EIA Regulations (as amended) (GNR 326) define a cumulative impact as follows:

"Cumulative impact in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities."

There are a number of other renewable energy facilities in the vicinity of the proposed Bulskop as detailed in the table below.

A Strategic Environmental Assessment process was undertaken by the CSIR in order to identify geographical areas most suitable for the rollout of Renewable Energy projects and the supporting electricity grid network. The aim of the assessment was to designate REDZs within which such development will be incentivised and streamlined. Subsequent to the SEA, these REDZ have been gazetted. Bulskop PV is within one of these Gazetted REDZ and as such deemed more suitable for such development on a cumulative scale.

Cumulative impacts that could occur due to the development of solar energy facilities and associated infrastructure in close proximity to each other include impacts such as:

- Visual impacts
- Socio-economic impacts
- Loss of vegetation and the inability to achieve conservation targets
- Impacts to soil and agricultural potential
- Impacts on heritage resources (in this area particularly relating to Archaeology resources)
- Surface water resources

In terms of possible cumulative impacts, one needs to look at the presence of similar facilities on the farm portion as well as the greater landscape.

- Cumulative impacts due to the cumulative effects of Bulskop PV added to all other renewable energy facilities in the Beaufort West area. These impacts need to be managed through strategic spatial planning documents such as an SEA and SDF and not through individual EIA processes.
- Cumulative impacts due to the cumulative effects of the 6 Solar Facilities proposed to be co-located on one site.

According the DFFE Database of renewable energy facilities, there are 6 renewable energy facilities in the vicinity of Bulskop PV[43]. Four of these are PV Facilities that have been

[43] Excluding those currently proposed as part of the Bulskop PV Cluster.

authorised, while 2 are indicated as wind energy facilities that have either lapsed or withdrawn.

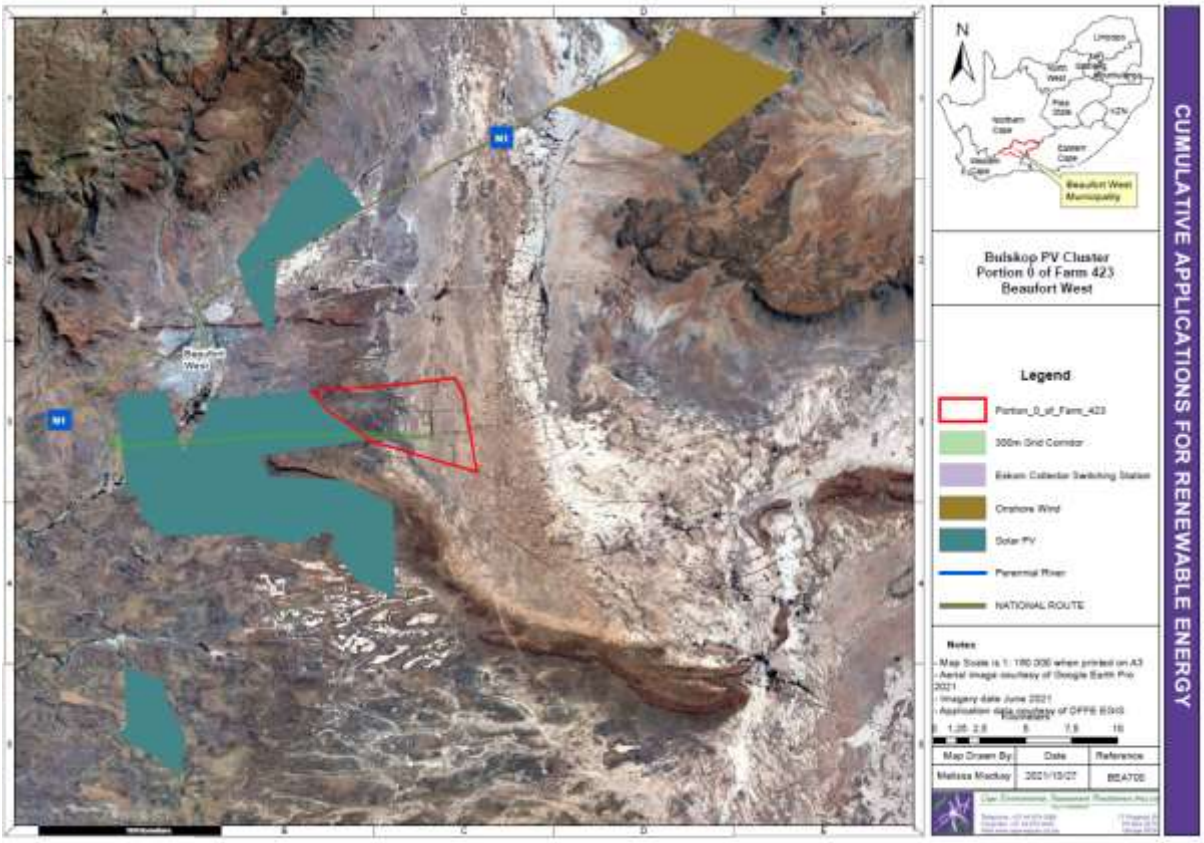

Figure 60: Renewable Energy Facilities within proximity of Farm 423 (Portion 0).

The table below reflects the other renewable energy facilities in close proximity to the proposed Bulskop PV.

Table 49: Renewable Energy Facilities in proximity to Bulskop PV and their status

#	Project	Technology	Status
1	Proposed Beaufort West Solar power plant site 3 near Beaufort West	PV	Approved
2	Proposed Establishment of the Beaufort West Solar Power Plant Site 2 , Western Cape	PV	Approved
3	Proposed wind and solar facility on Farm Lombaardskraal, Farm 330, Beaufort West, Western Cape	PV and Wind	Approved
4	The Proposed Beaufort West Photovoltaic Park on Portion 9 Of the Farm 161 Kuilspoort in The Western Cape Province	PV	Approved
5	Proposed 300MW PV solar energy facility on the Farm Streenrotsfontein near Beaufort	Wind	Withdrawn/lapsed
6	Proposed establishment of Beaufort West wind energy project, Murraysburg	Wind	Withdrawn/Lapsed
7	Hoodia PV	PV	In process
8	Gamka PV	PV	In process
9	Salsola PV	PV	In process
10	Rosenia PV	PV	In process
11	Hardeveld PV	PV	In process

Cape EAPrac does not have details on the exact configuration of these facilities[44], however, based on the assumption that each facility will have a maximum generation capacity of 100MW and will on average will result in the transformation of a maximum of 250ha, one can assume the following transformation of the two vegetation types associated with the greater area.

Table 50: Potential habitat transformation proximity to Bulskop PV.

Status	Transformation Area in Hectares
In operation	0
Under construction	0
Authorised	1000
EIA in Progress	1471

It is impossible to foresee how many of these projects will reach preferred bidder status in terms of the REIPPPP and will eventually be constructed. As a worst-case scenario one can assume a total cumulative transformation of 2471 hectares (based on the currently available information).

It is important to note that the projects in the area affect both the Gamka Karoo Vegetation type as well as the Southern Karoo Riviere and as such the cumulative impact in the landscape will not be limited to a single habitat type.

Potential cumulative impacts identified for the project include various negative impacts such as loss of habitat, visual massing, loss of agricultural land an influx jobseekers and change in the area's sense of place, but also include positive cumulative impacts on the economy, business development, and employment.

From a terrestrial and aquatic biodiversity perspective, The Loss / Degradation to Local Ecology was deemed to have a moderate impact when the project is considered in isolation, but a high impact when considered cumulatively with the other projects in the area.

From a social perspective the project is deemed to have a high positive cumulative impact from employment, skills and business opportunities and skills development and a low negative cumulative impact on sense of place and Local Services and accommodation.

From a visual perspective the long-term change in land use setting a precedent for other similar types of solar energy projects, has a moderate cumulative impact.

6.13 COMPARATIVE ASSESSMENT OF ALTERNATIVES

As outlined in section 2.10 and 2.11 of this report the preferred alternative was developed following a risk adverse approach, where highly sensitive features and landscapes identified by the participating specialists were avoided.

For the purposed of this Basic Assessment, the Preferred alternative and the No Go Alternative were assessed.

From a Terrestrial and Aquatic Biodiversity Perspective the specialist assessed the following impacts of the no go Alternative:

- Destruction, fragmentation and degradation of habitats and ecosystems due to grazing and trampling by livestock.
- Spread and/or establishment of alien and/or invasive species.
- Displacement of faunal community (Including several SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, hunting, dust, vibration).

[44] Actual footprints of the 6 x projects proposed as part of the Bulskop Cluster are known.

- Mortalities and displacements of fauna and flora SCCs.

The significance of these impacts associated with the no-go alternative was rated as moderate to moderately high, which is higher than the preferred alternative which is rated as low-moderate after mitigation.

6.14 IMPACT SUMMARY

The table below summarises the significance (with mitigation) of all impacts assessed in the sections above[45].

For ease of easy references, impacts are visually reflected using the following colour scheme[46].

All positive impacts (regardless of their significance)

Neutral or Negligible negative impacts

Very Low and Low negative impacts

Moderate and Moderate – High negative impacts

High and Very High negative impacts

Table 51: Summary of the significance of impacts associated with Bulskop PV[47].

Impact	Significance / Status
Construction Phase Terrestrial Biodiversity Impacts	
Destruction, fragmentation and degradation of habitats, and ecosystems	Moderate Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Displacement of faunal community (Including possible SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration);	Low Negative
Mortalities and displacements of fauna and flora SCCs.	Low Negative
Operational Phase Terrestrial Biodiversity Impacts	
Continued fragmentation and degradation of habitats and ecosystems	Moderate Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, collisions with substation, noise, light, dust, vibration)	Low Negative
Reduced dispersal of fauna	Low Negative
Chemical pollution	Low Negative
Decommissioning Phase Terrestrial Biodiversity Impacts	
Continued fragmentation and degradation of habitats and ecosystems	Low Negative
Spread and/or establishment of alien and/or invasive species	Low Negative
Agricultural Impacts – all phases.	
Loss of agricultural potential by occupation of land	Low Negative
Loss of agricultural potential by soil degradation	Low Negative
Dust impact	Low Negative
Enhanced agricultural potential through increased financial security for farming operations (positive impact)	Low Positive
Heritage Impacts All Phases	
Impacts on Cultural Landscape	Low Negative
Impacts on Archaeology Resources	None

[45] In order to attain these outcomes, the mitigation measures reflected in section 7 of the report need to be implemented.

[46] Where specialist ratings fall across 2 of the groups, the worst case is reflected in the quick reference.

[47] This includes cumulative impacts associated with the facility

Impact	Significance / Status
Impact on Palaeontology Resources	Low Negative
Visual Impacts	
Visual Impacts during the Construction Phase	Low Negative
Visual Impacts during the operational Phase	Medium – High Negative
Visual Impacts during the closure and decommissioning phase	Low Negative
Construction Phase Aquatic Risks	
Clearing associated with construction of roads and laydown yards	Low Negative
Final landscaping and post-construction rehabilitation	Low Negative
Stormwater Management Infrastructure	Low Negative
Erosion and sedimentation control measures	Low Negative
Pollution Control	Low Negative
Staff ablutions	Low Negative
Operation of machinery & equipment	Low Negative
Temporary infrastructure	Low Negative
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Low Negative
Increased traffic and human disturbance (maintenance)	Low Negative
Alien invasive plants	Low Negative
Decommissioning of the solar facility.	Low Negative
Operational Phase Aquatic Risks	
Increased hard surfaces due to solar panels and roads and stormwater infrastructure	Low Negative
Increased traffic and human disturbance (maintenance)	Low Negative
Alien invasive plants	Low Negative
Decommissioning Phase Aquatic Risks	
Decommissioning of the solar facility	Low Negative
Construction Phase Social Impacts	
Creation of employment and business opportunities	Medium Positive
Presence of construction workers and potential impacts on family structures and social networks	Low Negative
Influx of job seekers	Low Negative
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	Low Negative
Increased risk of veld fires	Low Negative
Impact of construction activities and vehicles	Low Negative
Loss of farmland	Low Negative
Operational Phase Social Impacts	
Promotion of renewable energy projects	High Positive
Creation of employment and business opportunities	Medium Positive
Establishment of Community Trust	High Positive
Generate income for affected landowner/s	Medium Positive
Visual impact and impact on sense of place	Low Negative
Impact on tourism	Low Negative
Cumulative Social Impacts	
Cumulative impact on sense of place	Low Negative
Cumulative impact on services	Low Negative
Cumulative impact on local economies	High Positive
Decommissioning Phase Social Impacts	
Social impact on the local economy associated with decommissioning	Low Negative
Pre-Construction Phase Avifaunal Impacts.	
Temporary disturbance of avifauna due to increased human presence and possible use of machinery and/or vehicles.	Absent
Construction Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade CBA1 and CBA2 habitat, ultimately displacing avifauna)	Moderate
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Collection of eggs and poaching	Low
Roadkill	Low
Chemical pollution associated with dust suppressants	Low

Impact	Significance / Status
Displacement or death of SCCs.	Moderate
Operational Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)	Moderate
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Collection of eggs and poaching	Low
Roadkill	Low
Collison's with PV and associated infrastructure	Moderate
Electrocution by infrastructure and connections to PV	Moderate
Electrocution by infrastructure and connections to PV	Low
Chemical pollution associated with measures to keep PV clean	Low
Fencing of PV site	Low
Displacement or death of SCCs.	Moderate
Decommissioning Phase Avifaunal Impacts.	
Habitat Loss (Destroy, fragment and degrade habitat, ultimately displacing avifauna)	Low
Sensory disturbances (e.g. noise, dust, vibrations)	Low
Roadkil	Absent
Collisons with PV and associated infrastructure	Absent
Fencing of PV site.	Absent
Construction Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust	Low
Noise pollution due to increased traffic	Low
Operational Phase Traffic Impacts.	
The Traffic Specialist has confirmed that due to the very low Trip Generation during the Operational Phase will not result in any significant Traffic Impacts.	Absent
Decomissioning Phase Traffic Impacts.	
Transport of equipment, material and staff to site that leads to traffic congestion.	Low
Traffic on roads will generate dust.	Low
Noise pollution due to increased traffic.	Low

6.15 IMPACT STATEMENT

The majority of impacts range from high positive to medium negative with the exception of a single medium – high impact associated with the operational phase visual impacts relating to the large scale transformation of the landscape. As this medium – high impact associated with landscape change is accommodated wholly within the Renewable Energy Development Zone, it is deemed to be acceptable.

All high, very high and critical negative impacts have been avoided by the avoidance of sensitive features or have been mitigated to acceptable levels

None of the participating specialists identified any impacts that remain high or very-high after mitigation. The preferred layout (Layout Alternative 1) avoids the main sensitive features, (most notably watercourses , Ridges, and visually sensitive areas) with the exception of a water course crossing associated with the access road.

The affected area is considered suitable for development and there are no impacts associated with Bulskop PV that cannot be mitigated to an acceptable level. With the enhancement measures suggested by the Social Specialist, high positive impacts on Creation of employment and business opportunities, Establishment of Community Trust, Generation income for affected landowner and Cumulative impact on local economies can be expected.

As such there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the layout provided for the assessment, Bulskop PV can be supported from a terrestrial biodiversity, Aquatic biodiversity, avifaunal, visual, social, heritage (inclusive of Archaeology, Cultural Landscape and Palaeontology), agricultural and traffic point of view.

A map showing the proposed activity in relation to the key sensitive features is in attached in Appendix D. All sensitive features along with their appropriate buffers are shown in this plan. As required by the EMPr, all areas outside of the proposed development footprint are to be demarcated as no go areas..

Please refer to the table in the section above listing the key impacts and their significance post mitigation for the preferred alternative. This section must be read in conjunction with the suggested mitigation measures listed in section 7 of this Report.

The table below shows the listed activities applied for with a reference of where the impacts associated with the specific activity are assessed by specialists.

Table 52: Specialist Impact Assessment of Listed Activities.

Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended**	**Specialist Assessment**
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
12	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Appendix E1 and E2
24	The development of a road— (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;	Appendices E6, E8 and E9
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— ((ii) where no reserve exists, where the existing road is wider than 8 metres;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
Activity No(s):	**Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended**	
1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more,	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
15	The clearance of an area of 20 hectares or more of indigenous vegetation.	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. i. Western Cape	Appendices E1, E2, E3, E4, E5, E6, E7 and E8

	ii. Areas outside urban areas; (aa) Areas containing indigenous vegetation;	
12	The clearance of an area of 300 square metres or more of indigenous vegetation. i. Western Cape ii. Within critical biodiversity areas identified in bioregional plans;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. i. Western Cape ii. All areas outside urban areas: (aa) Areas containing indigenous vegetation;	Appendices E1, E2, E3, E4, E5, E6, E7 and E8

7. MITIGATION MEASURES

Please refer to the table below, which summarises the mitigation measures recommended by both the Specialists and Cape EAPrac. This table summarises the mitigations, and details whether they should be included as conditions of approval, or whether they have been included as actions in the EMPr. The table furthermore reflects to which stage of the development the proposed mitigation measures are applicable. In instances where suggested mitigations have already been incorporated into the design phase, they have been reflected as such.

Table 53: Recommended mitigation measures required for the construction, operation and decommissioning of the Bulskop PV development.

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
Aquatic Biodiversity					
Design and implement an effective stormwater management plan.	✓		✓	✓	
Promote water infiltration into the ground beneath the solar panels		✓	✓	✓	
Release only clean water into the environment.		✓	✓		
Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g., slabs of concrete with rocks cemented in).		✓	✓	✓	
Re-vegetate denuded areas as soon as possible.		✓	✓		
Regularly clear drains.		✓		✓	
Minimise the extent of concreted / paved / gravel areas		✓	✓	✓	

[48] In this instance, the construction phase includes mitigation measures associated with pre-construction and planning.

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving		✓	✓		
Avoid excessively compacting the ground beneath the solar panels.		✓	✓		
Where possible minimise the use surfactants to clean solar panels and herbicides to control vegetation beneath the panels. If surfactants and herbicides must be used do so well prior to any significant predicted rainfall events.		✓		✓	
Promptly remove / control all alien and invasive plant species that may emerge during construction (i.e., weedy annuals and other alien forbs) must be removed.		✓	✓	✓	
Develop and implement a rehabilitation and closure plan	✓				✓
Appropriately rehabilitate the development area by ripping, landscaping and re-vegetating with locally indigenous species					✓
Terrestrial Biodiversity					
A comprehensive stormwater management plan must be developed.	Already forms part of this environmental process		✓	✓	
A vegetation alien invasive management plan should be implemented. This plan must be implemented during the construction phase of the project and continue for the life of the project. This plan must be adapted based on changing site conditions	✓		✓	✓	
A fire management plan needs to be compiled and implemented;		✓	✓	✓	
An adaptive rehabilitation plan needs to be implemented from the onset of the project. This must be compiled with input from independent ecological specialists;	✓		✓	✓	
A competent Environmental Control Officer (ECO) must oversee the construction and rehabilitation phase of the project, with watercourse adjacent areas as a priority;	✓		✓		✓
An infrastructure monitoring and service plan must be compiled and implemented during the operational phase. This will include the monitoring of all stormwater discharge points and energy dissipation structures in the development area	✓		✓	✓	
An annual monitoring programme of the floodplain and downstream habitat is recommended to establish trends and monitor the impacts of the proposed project for a period of one year post construction.	✓		✓	✓	
Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of		✓	✓	✓	✓

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
hydrocarbons oils, diesel etc.) or construction materials on site (e.g., concrete) in such a way as to prevent them leaking and entering the environment					
Mixing of concrete must under no circumstances take place within the drainage lines. No batching may be allowed on the bare ground, it must be ready-mix or batched on batching plates.		✓	✓	✓	✓
The water resources outside of the specific development area must be avoided;	✓		✓		
Laydown yards, camps and storage areas must be beyond the watercourse areas. Where possible, the construction of the crossings must take place from the existing road and not from within the drainage line;		✓	✓	✓	
The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly		✓	✓	✓	✓
Prevent uncontrolled access of vehicles through the watercourse that can cause a significant adverse impact on the hydrology and alluvial soil structure of these areas		✓	✓		✓
All chemicals and toxicants to be used for the construction must be stored outside the watercourses and in a bunded area within the site camp. Mobile refuelling must be done over a drip tray beyond of all watercourse and buffer areas		✓	✓	✓	✓
All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site		✓	✓	✓	✓
All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;		✓	✓		
Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the development area. These should not be placed near any water course or in buffer zones. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation);		✓	✓		
Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the watercourses		✓	✓	✓	
All removed soil and material must not be stockpiled within the watercourses. Stockpiling should take place outside of watercourses. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds		✓	✓		

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
Erosion and sedimentation into the drainage lines must be minimised through the effective stabilisation in compliance with the stormwater and erosion management plan (e.g., gabions and Reno mattresses) and the re-vegetation of any disturbed areas		✓	✓		
Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses that are drought tolerant) to protect the exposed soil		✓	✓		
No dumping of construction material on-site may take place		✓	✓		
All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported		✓	✓		
Make sure all excess consumables and building materials / rubble are removed from site and deposited at an appropriate waste facility		✓	✓		
Landscape and re-vegetate all cleared areas as soon as possible to limit erosion potential		✓	✓	✓	
Visual					
A 100m buffer should be retained between the Steenbokkie PNR to ensure that the reserve sense of place is not degraded any further	✓		✓		
Following the removal of the vegetation, wind blown dust during construction should be monitored by the ECO to ensure that it does not become a nuisance factor to the local receptors. Should excessive dust be generated from the movement of vehicles on the roads such that the dust becomes visible to the immediate surrounds, dust-retardant measures should be implemented under authorisation of the ECO		✓	✓		
Topsoil from the footprints of the road and structures should be dealt with in accordance with EMP.		✓	✓		
All proposed buildings should be painted a grey-brown colour		✓	✓		
Fencing should be simple, diamond shaped (to catch wind-blown litter) and appear transparent from a distance. The fences should be checked on a monthly basis for the collection of litter caught on the fence		✓	✓		
Signage on the R61 should be moderated		✓	✓		
Lights at night have the potential to significantly increase the visual exposure of the proposed project. It is recommended that mitigations be implemented to reduce light spillage (refer to appendix for general guidelines).		✓	✓		
The height of the PV panels should not exceed 5.5m above ground level without further visual and landscape impact assessment	✓	✓	✓		

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
Control of lights at night to allow only local disturbance to the current dark sky night landscape (refer to appendix for general guidelines		✓		✓	
Continued erosion control and management of dust		✓		✓	
All structures should be removed and where possible, recycled		✓			✓
Building structures should be broken down (including foundations)		✓			✓
The rubble should be managed according to NEMWA and deposited at a registered landfill if it cannot be recycled or reused.		✓			✓
All compacted areas should be ripped to a depth of 500cm to loosen the soil, and then rehabilitated according to a rehabilitation specialist		✓			✓
Monitoring for soil erosion should be undertaken on a routine basis		✓			✓
Traffic					
The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.		✓	✓		✓
Dust suppression of gravel roads during the construction phase, as required.	✓	✓	✓		✓
Regular maintenance of gravel roads by the Contractor during the construction phase and by the Owner/Facility Manager during the operation phase.		✓	✓		✓
The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network.		✓	✓		✓
Staff and general trips should occur outside of peak traffic periods as far as possible.		✓	✓		✓
If required, low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.		✓	✓		✓
The preferred route should be surveyed to identify problem areas (e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification). After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading		✓	✓		✓

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
of the construction phase and reinstated after construction is completed.					
Design and maintenance of internal roads. The internal gravel roads will require grading with a grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional.		✓	✓		✓
Avifauna					
Areas of already fragmented indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible. The development footprint must be demarcate to ensure the development does not infringe on the surrounding areas.		✓	✓	✓	✓
The site ecological importance for SCCs is rated as high, and therefore it is recommended that the remaining part of the farm be left undeveloped.		✓	✓	✓	✓
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.		✓	✓		✓
Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.		✓	✓		✓
Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type.		✓	✓		✓
Erosion control and alien invasive management plan must be compiled.		✓	✓	✓	✓
Environmentally friendly dust suppressants need to be utilised		✓	✓		✓
A fire management plan needs to be compiled and implemented to restrict the impact fire might have on the surrounding areas.		✓	✓	✓	✓
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments. Signs must be put up to enforce this.		✓	✓		✓
All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species (e.g., guineafowl and francolin),		✓	✓	✓	✓

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.					
The duration of the construction should be kept to a minimum to avoid disturbing avifauna.		✓	✓		
Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (red/green) motion detection lights should be used wherever possible.		✓		✓	
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limit (40km/h), to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.		✓	✓		
Schedule or limit (where feasible) activities during least sensitive periods, to avoid migration, nesting and breeding seasons (May – August)		✓	✓		
All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region		✓	✓	✓	
All areas to be developed must be walked through prior to any activity to ensure no nests or avifauna species are found in the area. Should any Species of Conservation Concern be found and not move out of the area or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	✓	✓	✓		
The design of the proposed PV must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017).		✓	✓		
Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used.		✓	✓		
All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution		✓	✓		
Use environmentally friendly cleaning and dust suppressant products		✓	✓	✓	
Fencing mitigations: • Top 2 strands must be smooth wire • Routinely retention loose wires • Minimum 30cm between wires Place markers on fences		✓	✓		
As far as possible power cables within the project area should be thoroughly insulated and preferably buried		✓	✓		

Mitigation	Condition of Approval	Included in EMPr	Construction[48] Phase	Operational Phase	Decommissioning Phase
Any exposed parts must be covered (insulated) to reduce electrocution risk		✓	✓		
White strips should be placed along the edges of the panels, to reduce similarity to water and deter birds and insects (Horvath et al, 2010). Consider the use of bird deterrent devices to limit collision risk.		✓	✓		

8. PUBLIC PARTICIPATION PROCESS

Section 41 in Chapter 6 of regulation 982 details the public participation process that has to take place as part of an environmental process. The table below provides a quick reference to show how this environmental process has or intends to comply with these legislated requirements relating to public participation.

Please refer to **Appendix F**, where all evidence of public participation is included.

Table 54: Public participation requirements in terms of S41 of R982

Regulated Requirement	Description
(1) If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land. (2) Sub regulation (1) does not apply in respect of-. (a) linear activities;	Proof of landowner consent for Bulskop PV is attached in **Annexure G2.** .
The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by -	
(a) fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of - (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site;	A site notice was placed at three positions along the R61. Photographic evidence and the location of these notices is attached in **Annexure F3**.
(b) giving written notice, in any of the manners provided for in section 47D of the Act, to -	
(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control	Mr Willie Van Zyl currently leases the Farm 423 (Portion 0) from the HB Van der Merwe Familie

Regulated Requirement	Description
of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	Trust. Mr Van Zyl has been added to the I&AP database.
(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;	Owners of adjacent properties have been notified of this environmental process. Such owners have been requested to inform the occupiers of the land of this environmental process. Please refer to **Annexure F4** for copies of these notifications
(iii) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;	The ward councillor has been notified of this environmental process. Please refer to **Annexure F4** for copies of these notifications
(iv) the municipality which has jurisdiction in the area;	The Beaufort West municipality (Planning and Technical Services) as well as the Central Karoo District Municipality have been notified of this environmental process. Please refer to **Annexure F4** for copies of these notifications.
(v) any organ of state having jurisdiction in respect of any aspect of the activity; and	Please refer to section **Annexure F1** showing the list of organs of state that were notified as part of this environmental process. Please refer to **Annexure F4** for copies of these notifications.
(vi) any other party as required by the competent authority;	The DFFE has been given an opportunity to comment on this Draft BAR, any other parties identified will be given an opportunity to comment.
(c) placing an advertisement in - (i) one local newspaper; or (ii) any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	An advert calling for registration of I&APs and notifying of the availability of the Draft Basic Assessment Report was placed in Die Courier local newspaper. Please refer to **Annexure F3** for a copy of this advertisement. There is currently no official Gazette that has been published specifically for the purpose of providing public notice of applications
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);and	Adverts were not placed in provincial or national newspapers, as the potential impacts will not extend beyond the borders of the municipal area.
(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to - (i) illiteracy;	Notifications have included provision for alternative engagement in the event of illiteracy, disability or any other disadvantage. In such instances, Cape EAPrac will engage with such individuals in such a manner as agreed on with the competent authority.

Regulated Requirement	Description
(ii) disability; or (iii) any other disadvantage.	
(3) A notice, notice board or advertisement referred to in sub regulation (2) must - (a) give details of the application or proposed application which is subjected to public participation; and (b) state - (i) whether basic assessment or S&EIR procedures are being applied to the application; (ii) the nature and location of the activity to which the application relates; (iii) where further information on the application or proposed application can be obtained; and (iv) the manner in which and the person to whom representations in respect of the application or proposed application may be made.	Please refer to **Annexure F3**.
(4) A notice board referred to in sub regulation (2) must - (a) be of a size at least 60cm by 42cm; and (b) display the required information in lettering and in a format as may be determined by the competent authority.	Please refer to **Annexure F3**.
(5) Where public participation is conducted in terms of this regulation for an application or proposed application, sub regulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that - (a) such process has been preceded by a public participation process which included compliance with sub regulation (2)(a), (b), (c) and (d); and (b) written notice is given to registered interested and affected parties regarding where the - (i) revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b); (ii) revised environmental impact report or EMPr as contemplated in regulation 23(1)(b); or (iii) environmental impact report and EMPr as contemplated in regulation 21(2)(d); may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	This will be complied with if final reports are produced later on in the environmental process.

Regulated Requirement	Description
(6) When complying with this regulation, the person conducting the public participation process must ensure that - (a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and (b) participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application. (7) Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	All reports that are submitted to the competent authority will be subject to a public participation process. These include: - Draft BAR - Draft EMPr - All specialist reports that form part of this environmental process.

8.1 REGISTRATION OF KEY STAKEHOLDERS

A number of key stakeholders were automatically registered and were given an opportunity to comment on the Draft BAR. Copies and proof of these notifications are included in **Annexure F4**. A list of key stakeholders registered for this process included in the table below.

Table 55: Key Stakeholders automatically registered as part of the Environmental Process

Stakeholders Registered		
Neighbouring property owners	Department of Environmental Affairs and Development Planning (Western Cape)	Department of Water and Sanitation
Western Cape Department of Transport and Public Works	Beaufort West Municipality	Department of Science and Technology
Beaufort West Municipality: Ward 2 Councillor	South African National Roads Agency Limited	The Council for Scientific and Industrial Research
South African Heritage Resources Agency	Heritage Western Cape	The South African Square Kilometre Array
Breede Gouritz Catchment Management Agency	Department of Health	The South African Civil Aviation Authority
Department of Forestry, Fisheries and the Environment: Biodiversity Conservation Directorate	Department of Minerals and Energy	Affected Landowner
Provincial Department of Agriculture	Eskom	Department of Communications
Endangered Wildlife Trust.	Department of Mineral Resources	SENTECH
Cape Nature	Birdlife South Africa.	South African National Defence Force.
Steenbokkie Nature Reserve	SANParks – Karoo National Park	Department of Water and Sanitation

8.2 PUBLIC PARTICIPATION PLAN

A Public Participation Plan was submitted and approved in compliance with regulation GNR660 published on 05 June 2020 in terms of the Disaster Management Act.

In compliance with section 5.1 and annexure 2 of these regulations a public participation plan must be presented to the competent authority for approval prior to implementation. The mechanism of a pre-application meeting was utilised to present this plan to the Department for approval. The public participation plan submitter was approved by Mr Lunga Dlova of the Department on 10 November 2022.

Section 40(2) in Chapter 6 of regulation 982 requires that the public participation process contemplated in this regulation must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation with—

(a) the competent authority;

(b) every State department that administers a law relating to a matter affecting the environment relevant to an application for an environmental authorisation;

(c) all organs of state which have jurisdiction in respect of the activity to which the application relates; and

(d) all potential, or, where relevant, registered interested and affected parties.

In order to comply with this requirement, all parties listed in sub sections a, b and c above with full digital copies of the Draft Basic Assessment Report (DBAR), Draft Environmental Management Programme and all specialist studies and plans. Such digital copies have been provided to the competent authority via the file upload portal. Copies of the documentation to organs of state and state departments have been provided via two digital platforms (website and direct download link). Where such authorities do not have access to digital platforms, sanitised copies of the documentation will be provided to such parties on their request.

In terms of point d above, all Interested & Affected Parties (I&APs) that are identified or register as part of the process will be provided access to the Draft BAR via the following:

1. The digital copy of the documentation that will be on the Cape EAPrac website and direct download link.
2. Potential and registered I&APs will be informed that copies of the documentation can be provided via postal, or courier services should they not have access to the digital platforms.

8.3 AVAILABILITY OF DRAFT BASIC ASSESSMENT REPORT.

This Draft Basic Assessment report is available to all Registered and Potential Interested and Affected Party for a 30 day-comment period extending from **13 April 2022 – 19 May 2022.**

9. CONCLUSION AND RECOMMENDATIONS

This environmental process is currently being undertaken to present proposals to the public and potential I&APs and to identify and assess environmental impacts, issues and concerns raised as a result of the proposed development.

Cape EAPrac is of the opinion that the information contained in this Basic Assessment Report and the documentation attached hereto is sufficient to allow the I&APs to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the activities applied for.

This environmental process has not identified any fatal flaws with the proposal and as such it is our reasoned view that the project should be considered for authorisation, subject to the outcome of the public participation process and on condition that all the mitigation measures outlined in section 7 of the report are adopted and implemented. All specialists concur that the development as proposed (Layout Alternative 1) can be considered for approval subject to the implementation of all mitigation measures. All impacts range from high positive to medium - high negative and all high, very high and critical negative impacts have been avoided by the risk adverse approach or mitigated to acceptable levels.

All stakeholders are requested to review the Draft BAR and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 30-day comment period. All comments received during this comment period will be considered, responded and included in the Final BAR that will be submitted to DFFE for decision making.

It is the recommendation Cape EAPrac that the development proposal, Layout Alternative 1 be considered for approval by the competent Authority, subject to the outcome of the public participation process and on condition that all the suggested mitigation measures are implemented, all other legislative approvals be obtained, and that the final EMPr be strictly adhered to.

9.1 REMAINDER OF ENVIRONMENTAL PROCESS

The following process is to be followed for the remainder of the environmental process:

- All registered I&AP's are provided with an opportunity to review and comment on this document.
- All comments will be considered and responded to and the proposed development adapted where necessary.
- The Final BAR will then be submitted to the DFFE for consideration and decision-making;
- The DFFE's decision (Environmental Authorisation) and the appeal process will be communicated with all registered I&APs.

10. ABBREVIATIONS

AIA	Archaeological Impact Assessment
BGIS LUDS	Biodiversity Geographic Information System Land Use Decision Support
CBA	Critical Biodiversity Area
CDSM	Chief Directorate Surveys and Mapping
CEMPr	Construction Environmental Management Programme
DEA	Department of Environmental Affairs
DEA&NC	Department of Environmental Affairs and Nature Conservation
DME	Department of Minerals and Energy
DSR	Draft Scoping Report
EAP	Environmental Impact Practitioner
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GPS	Global Positioning System
GWh	Giga Watt hour
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
MW	Mega Watt

NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PM	Post Meridiem; “Afternoon”
PSDF	Provincial Spatial Development Framework
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
S.A.	South Africa
SACAA / CAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
TOPS	Threatened and Protected Species

11. REFERENCES

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[49] This reference list excludes specialist studies that form part of this environmental process, and which are contained in Annexure E1 – E12

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