DICOMA PV FACILITY AND ASSOCIATED INFRASTRUCTURE

North West Province

Scoping Report

October 2021

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PROJECT DETAILS

Title	:	Dicoma PV Facility and Associated Infrastructure, North West Province
Authors	:	Savannah Environmental (Pty) Ltd Rendani Rasivhetshele Jana de Jager Karen Jodas
Client	:	Dicoma PV (Pty) Ltd
Report Revision	:	Report for public review
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When used as a reference this report should be cited as: Savannah Environmental (2021) Scoping Report Dicoma PV Facility and associated infrastructure, North West Province.

PURPOSE OF THE SCOPING REPORT AND INVITATION TO COMMENT

Dicoma PV (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Scoping and Environmental Impact Assessment Process for the Dicoma PV Facility. The EIA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998). This Scoping report has been compiled in accordance with Appendix 2 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

This Scoping Report describes and assesses this proposed project and consists of the following chapters:

- **Chapter 1** provides background to the Dicoma PV facility project and the environmental impact assessment.
- **Chapter 2** provides a project description of Dicoma PV.
- **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
- **Chapter 4** describes the need for and alternatives considered for the Dicoma PV facility.
- **Chapter 5** outlines the approach to undertaking the Scoping/EIA process.
- **Chapter 6** describes the existing biophysical and social environment within and surrounding the study and development area.
- **Chapter 7** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
- **Chapter 8** presents the conclusions of the scoping evaluation for the Solar PV Facility.
- **Chapter 9** describes the Plan of Study (PoS) for the EIA phase.
- **Chapter 10** provides references used to compile the Scoping report.

The Scoping Report is available for review from Friday 15 October 2021 to Monday 15 October 2021 at the following locations: https://savannahsa.com/public-documents/energy-generation/

Please submit your comments by **Monday 15 November 2021** to:
Nicolene Venter PO Box 148, Sunninghill, 2157 Tel: 011-656-3237 Fax: 086-684-0547 Email: publicprocess@savannahsa.com

Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

Dicoma PV Facility is proposed on Portion 1 of the Farm Houthaalboomen 31, Portion 9 of the Farm Houthaalboomen 31, Portion 10 of the Farm Houthaalboomen 31, which is located approximately 5km north-west of the town of Lichtenburg in the North West Province. PV technology is proposed to be utilised for the generation of electricity, and the Dicoma PV facility will have a contracted capacity of up to 75MW. The grid connection infrastructure between the facility and the Eskom grid connection point is considered within a 100m corridor located on the southern boundary of Portion 1 of the Farm Houthaalboomen 31, with a LILO connection traversing Portion 0 of Farm Talene 25 and Portion 7 of Farm Elandsfontein 34. Two alternative grid connection solutions are proposed and evaluated.

The infrastructure associated with the solar PV facility, including all associated infrastructure will include:

- PV modules and mounting structures
- Inverters and transformers
- Battery Energy Storage System (BESS)
- Site and internal access roads (up to 8m wide)
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Temporary and permanent laydown area
- Grid connection solution (two alternative locations assessed) within a 100m wide corridor, including:
    - 33kV cabling between the project components and the facility substation
    - A 132kV facility substation
    - A 132kV Eskom switching station
    - A Loop-in-Loop out (LILO) overhead 132kV power line between the Eskom switching station and the existing Delareyville Munic–Watershed 1 88kV power line

The majority of potential impacts identified to be associated with the construction of Dicoma PV and associated infrastructure are anticipated to be localised and restricted to the development area itself and the grid connection corridor alternatives, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area. Minimal areas or features of high sensitivity were identified to be avoided by the development footprint.

The potentially significant issues related to the **construction** of the Dicoma PV facility include:

- Biodiversity and habitat loss and impacts on flora, fauna and avifauna resulting from activities such as site clearance for installation of the facility components and associated infrastructure.
- Soil erosion, loss or degradation due to site clearance and compaction for installation of the facility components and associated infrastructure and due to the construction on internal access roads.
- Impact on heritage and paleontological resources through construction activities.
- Visual impacts on the landscape.
- Social impacts, both positive and negative (job creation and business opportunities, impacts associated with construction workers in the area).

The potentially significant issues related to the **operation** of the Dicoma PV facility include:

- Change in land use from agriculture to energy generation.
- Habitat loss due to spread of alien vegetation
- Visual impacts.

» Positive social and economic impacts through job creation and economic benefits.

Overall Sensitivity Considerations

The potentially sensitive areas which have been identified through the environmental scoping study are illustrated in **Figure 1**. The scoping phase sensitivity map provides an informed estimate of the sensitivity on the project site, and specifically the Dicoma PV development area (indicated with the yellow outline) and associated grid connection corridor (alternatives indicated as purple and hatched corridors). The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included field surveys. During the site and desktop surveys, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development footprint for the facility and associated infrastructure. The development footprint is the area which will be assessed further in detail in the EIA Phase, in order to provide an assessment of environmental acceptability and suitability of the facility layout of the Dicoma PV Facility.

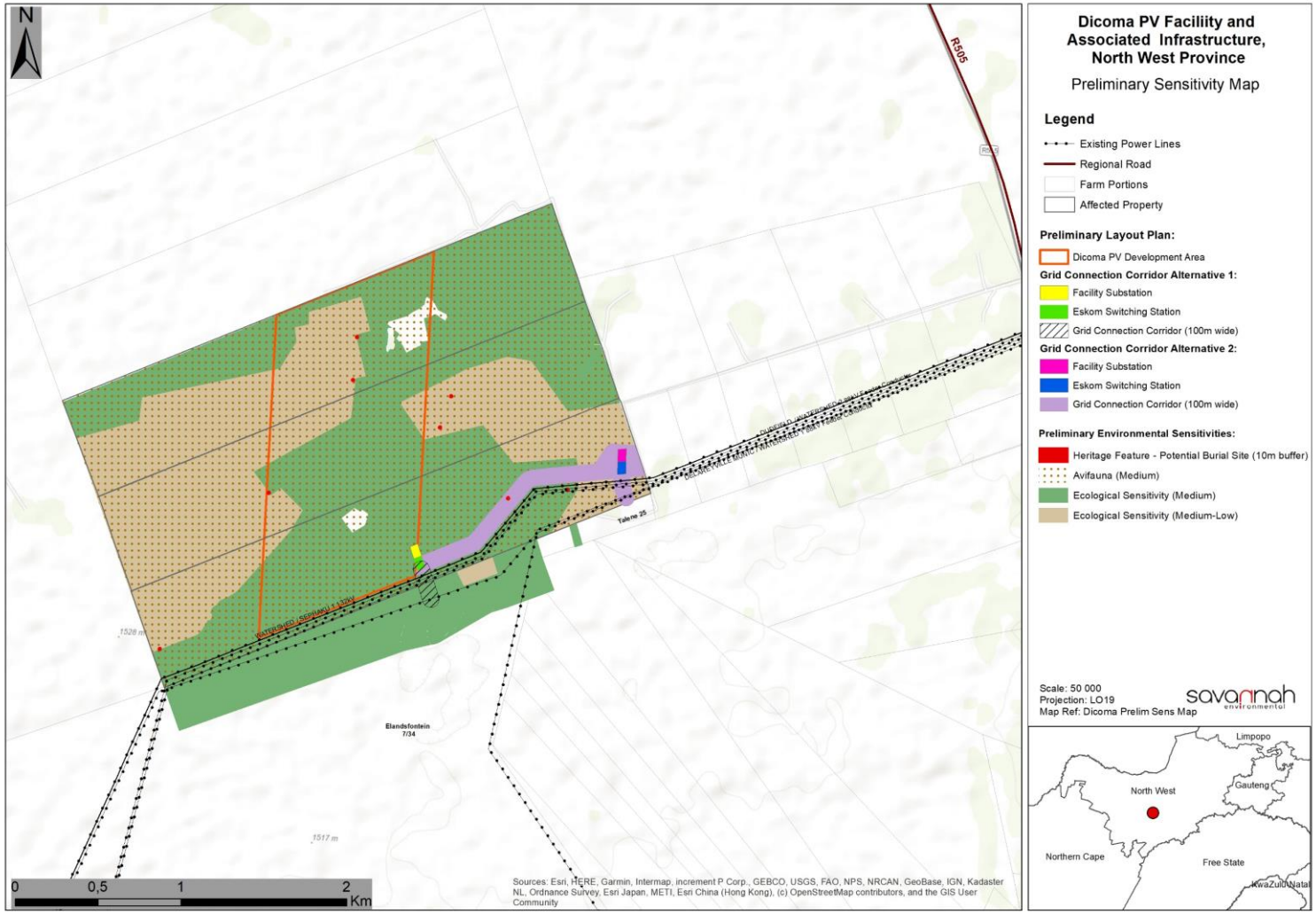

Figure 1: Environmental Sensitivity Map from the results of the scoping evaluation for the Dicoma PV Facility and associated infrastructure. The sensitivity map indicates the sensitivities for the project site, as well as the Dicoma PV development area (indicated with the orange outline) and the grid connection corridor alternatives (purple and hatched corridors).

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CHAPTER 1: INTRODUCTION

The Applicant, Dicoma PV (Pty) Ltd is proposing the construction of the Dicoma solar photovoltaic (PV) facility, planned to be located on a site located approximately 5km north-west of the town of Lichtenburg in the North West Province (refer to **Figure 1.1**). The development area falls within the jurisdiction of the Ditsobotla Local Municipality within the Ngaka Modiri Molema District Municipality.

The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 75MW. A project site consisting of the farms Portion 1, Portion 9, Portion 10 of the Farm Houthaalboomen 31, is being considered for the Dicoma PV facility. A development area of 176ha has been identified within the study area for the construction and operation of the Dicoma PV and its associated infrastructure, which is assessed within this Scoping Report. The grid connection for the facility will consist of underground cabling, a facility substation, an Eskom switching substation, and loop-in-loop out power line into an existing Eskom power line. The grid connection infrastructure between the facility and the Eskom grid connection point is considered within a 100m corridor located on the southern boundary of Portion 1 of the Farm Houthaalboomen 31, with a LILO connection traversing Portion 0 of Farm Talene 25 and Portion 7 of Farm Elandsfontein 34. Two alternative grid connection solutions are proposed and evaluated.

Site-specific studies and assessments will delineate areas of potential sensitivity within the identified project site. Once constraining factors have been confirmed, the layout of the solar PV facility can be planned to minimise social and environmental impacts. Two (2) additional 75MW PV facilities (Barleria PV and Setaria PV) are concurrently being considered adjacent to the project site (within Portion 1, Portion 9, Portion 10 of the Farm Houthaalboomen 31, and will be assessed through separate Environmental Impact Assessment (EIA) processes. The relative location of the three development areas is indicated in **Figure 1.2**.

From a regional perspective, the Lichtenburg area is considered favourable for the development of a commercial solar energy facility by virtue of prevailing climatic conditions, relief, aspect, the extent of the affected property, the availability of a grid connection (i.e. a point of connection to the national grid) and the availability of land on which the development can take place.

Dicoma PV facility is planned to be bid into the Department of Mineral Resource and Energy's (DMRE) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme with the aim of evacuating the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply with Dicoma PV facility set to inject up to 75MW into the national grid.

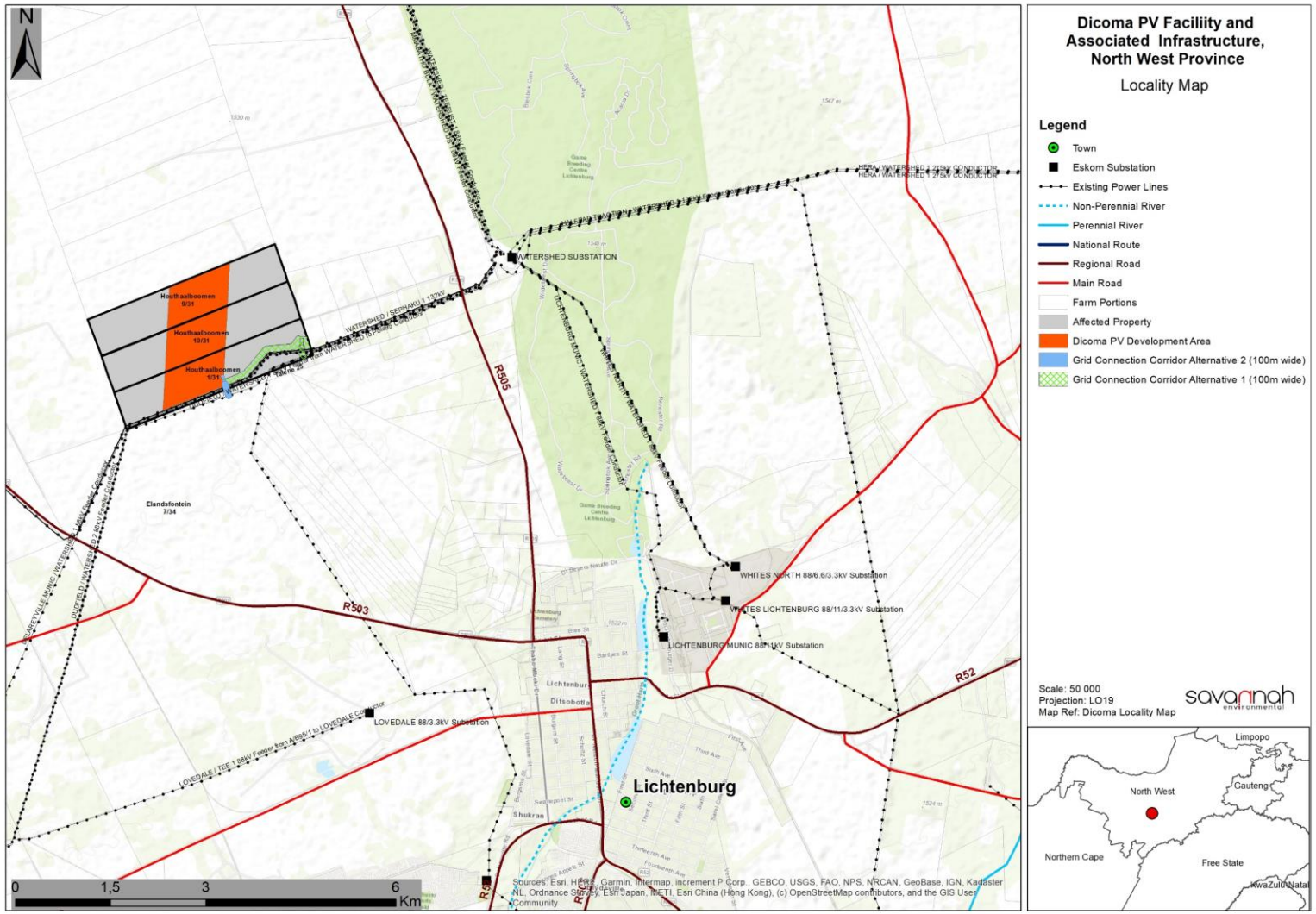

Figure 1.1: Locality map illustrating the location of the Dicoma PV development area within the larger project site, including the grid connection corridor alternatives (refer to **Appendix K** for A3 map).

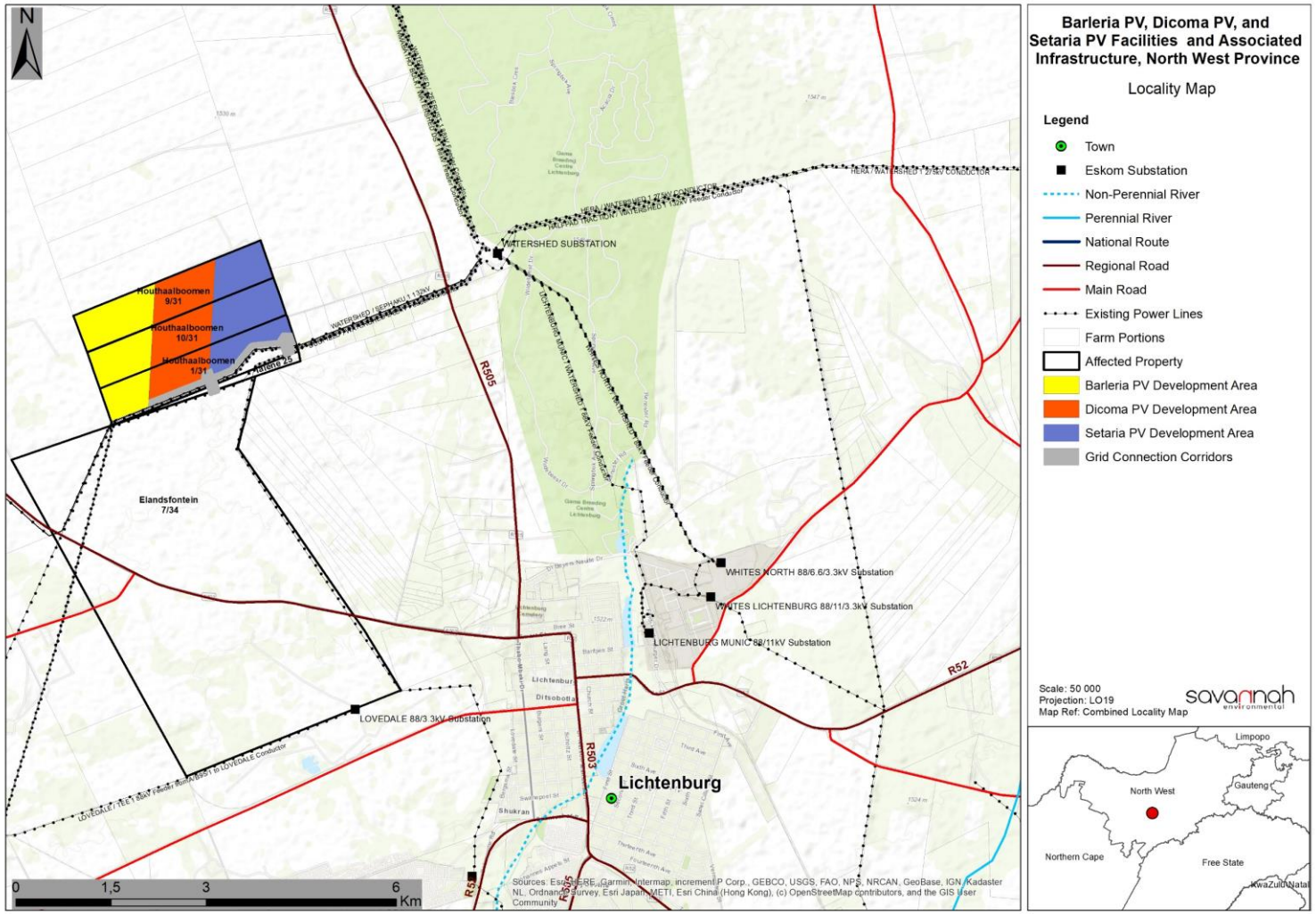

Figure 1.2: Locality map illustrating the locations of the Dicoma PV, Barleria PV and Setaria PV development areas within the project site (refer to **Appendix K** for A3 map)

1.1 Project Overview

The project site has been identified by the applicant as a technically feasible area which has the potential for the development of a solar PV facility, including a Battery Energy Storage System (BESS). A development area[1] of approximately 179ha has been identified within the project site for the development of Dicoma PV facility. The full extent of the PV development area as well as the grid connection corridors has been considered within this Scoping Report with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning. Within this identified development area, a development footprint[2] and facility layout will be defined based on the findings of the Scoping Study and will be further assessed during the EIA Phase. Therefore, the exact location of the development footprint within the development area for the Dicoma PV facility is not defined at this stage. The development footprint is estimated to require an area which is marginally less than the identified development area in extent (for the 75MW PV facility, including a BESS, and all associated infrastructure), however the extent of the development footprint will be confirmed in the EIA Phase once the layout design is available. The development area is larger than the area needed for the development footprint of a 75MW PV facility, and therefore provides the opportunity for the optimal placement of the infrastructure, ensuring avoidance of major identified environmental sensitivities or constraints identified through this Scoping and EIA process.

Table 1.1: A detailed description of the Dicoma PV development area

Province	North West Province
District Municipality	Ngaka Modiri Molema District Municipality
Local Municipality	Ditsobotla Local Municipality
Ward Number (s)	Ward 16
Nearest town(s)	Lichtenburg (~5km north-west)
Farm name(s) and number(s) of properties affected by the Solar PV Facility	Farm Houthaalboomen 31
Farm Portion(s), Name(s) and Number(s) associated with the PV Facility	Portion 1 of the Farm Houthaalboomen 31 Portion 9 of the Farm Houthaalboomen 31 Portion 10 of the Farm Houthaalboomen 31
Farm Portion(s), Name(s) and Number(s) of properties affected by the Solar PV LILO grid connection	Farm Houthaalboomen 31 Farm Talene 25 Farm Elandsfontein 34
Portion number(s) of properties affected by the Solar PV LILO grid connection	Portion 1 of the Farm Houthaalboomen 31 Portion 0 of Farm Talene 25 Portion 7 of Farm Elandsfontein 34
SG 21 Digit Code (s) for all properties	Portion 1 of the Farm Houthaalboomen 31 - T0IP00000000003100001 Portion 9 of the Farm Houthaalboomen 31 - T0IP00000000003100009 Portion 10 of the Farm Houthaalboomen 31 - T0IP00000000003100010 Portion 0 of Farm Talene 25 - T0IP00000000002500000 Portion 7 of Farm Elandsfontein 34 - T0IP00000000003400007

[1] The development area is that identified area (located within the project site 552ha) where the Dicoma PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~176ha in extent.

[2] The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Dicoma PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed by the PV infrastructure.

Current zoning	Agricultural (grazing of cattle)		
Current land use	Grazing (mainly cattle)		
Site Extent (Project Site)	~552ha		
PV Development Area	~179ha		
Site Coordinates (project site)		**Latitude:**	**Longitude:**
	Northern point	26° 5'43.47"S	26° 5'45.44"E
	Eastern point	26° 6'6.93"S	26° 6'1.63"E
	Southern point	26° 6'45.37"S	26° 5'48.14"E
	Western point	26° 6'15.94"S	26° 5'28.30"E
	Centre point	26° 6'14.61"S	26° 5'46.69"E

Dicoma PV will have a contracted capacity of up to 75MW and will include specific infrastructure, namely:

- PV modules and mounting structures
- Inverters and transformers
- Battery Energy Storage System (BESS)
- Site and internal access roads (up to 8m wide)
- Site offices and maintenance buildings, including workshop areas for maintenance and storage
- Temporary and permanent laydown area
- Grid connection solution within a 100m wide corridor, including:
  - 33kV cabling between the project components and the facility substation
  - A 132kV facility substation
  - A 132kV Eskom switching station
  - A Loop-in-Loop out (LILO) overhead 132kV power line between the Eskom switching station and the existing Delareyville Munic–Watershed 1 88kV power line[3].

Two alternative grid connection configurations have been considered for the proposed project. The key infrastructure components proposed as part of the Dicoma PV facility are described in greater detail in Chapter 2 of this Scoping Report.

The overarching objective for the Dicoma PV facility is to maximise electricity production through exposure to the available solar resource, while minimising infrastructure, operational and maintenance costs, as well as potential social and environmental impacts. In order to meet these objectives, local level environmental and planning issues will be assessed through the EIA process with the aid of site-specific specialist studies in order to delineate areas of sensitivity within the identified project site; this will serve to inform and optimise the design of the solar PV facility.

1.2 Requirement for an Environmental Impact Assessment Process

Section 24 of South Africa's National Environmental Management Act (No. 107 of 1998) (NEMA) pertains to Environmental Authorisations (EA), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the Competent Authority. The 2014 Environmental Impact Assessment (EIA) Regulations, as amended (GNR

[3] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, Dudfield-Watershed 1 88kV and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

326) published under NEMA prescribe the process to be followed when applying for EA, while the Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324)) contain those activities which may not commence without EA from the Competent Authority.

Various aspects of Dicoma PV are listed as activities that may have a detrimental impact on the environment. The primary listed activity triggered by Dicoma PV is Activity 1 of Listing Notice 2 (GN R325) which relates to the development of facilities or infrastructure for the generation of electricity from a renewable resource where the generating capacity is 20MW or more. Dicoma PV will have a contracted capacity of up to 75MW.

The Dicoma PV facility requires EA from the National Department of Forestry, Fisheries and the Environment (DFFE) subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326).

In terms of GNR 779 of 01 July 2016, the DFFE has been determined as the Competent Authority for all projects which relate to the Integrated Resource Plan for Electricity (IRP) 2010 – 2030, and any updates thereto. Through the decision-making process, the DFFE will be supported by the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT) as the commenting authority.

1.3 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This Scoping Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(a)(i) the details of the EAP who prepared the report and (ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae	The details of the EAP has been who prepared the report is included in **Section 1.5**. The Curriculum vitae of the Savannah Environmental team has been included as **Appendix A**.
(b) the location of the activity, including (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	The location of the Dicoma PV facility has been included under **Section 1.1** and within **Table 1.1**.
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A locality map illustrating the location of the Dicoma PV facility has been included as **Figure 1.1** in this chapter.

This Scoping Report consists of ten chapters, which include:

» **Chapter 1** provides background to the Dicoma PV facility project and the environmental impact assessment.

» **Chapter 2** provides a project description of Dicoma PV.
» **Chapter 3** outlines strategic regulatory and legal context for energy planning in South Africa and specifically relating to the project.
» **Chapter 4** describes the need for and alternatives considered for the Dicoma PV facility.
» **Chapter 5** outlines the approach to undertaking the Scoping/EIA process.
» **Chapter 6** describes the existing biophysical and social environment within and surrounding the study and development area.
» **Chapter 7** provides an identification and evaluation of the potential issues associated with the proposed solar PV facility and associated infrastructure.
» **Chapter 8** presents the conclusions of the scoping evaluation for the Solar PV Facility.
» **Chapter 9** describes the Plan of Study (PoS) for the EIA phase.
» **Chapter 10** provides references used to compile the Scoping report.

1.4 Overview of this Environmental Impact Assessment (EIA) Process

An EIA is an effective planning and decision-making tool for the project developer as it allows for the identification and management of potential environmental impacts. It provides the opportunity for the developer to be forewarned of potential environmental issues and allows for the resolution of the issues reported on in the Scoping and EIA reports as well as dialogue with interested and affected parties (I&APs).

The EIA process comprises of two (2) phases (i.e. Scoping and Impact Assessment) and involves the identification and assessment of potential environmental impacts through the undertaking of independent specialist studies, as well as public participation. The processes followed in these two phases is as follows:

» The **Scoping Phase** includes the identification of potential issues associated with the project through a desktop study (considering existing information) and consultation with affected parties and key stakeholders. This phase considers the broader project site in order to identify and delineate any environmental fatal flaws, no-go and / or sensitive areas. Following a public review period of the Scoping report, this phase culminates in the submission of a final Scoping Report and Plan of Study for the EIA to the Competent Authority for consideration and acceptance.
» The **EIA Phase** involves a detailed assessment of the potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase considers a proposed development footprint within the project site and includes detailed specialist investigations as well as public consultation. Following a public review period of the EIA Report, this phase culminates in the submission of a final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to the Competent Authority for final review and decision-making.

1.5 Appointment of an Independent Environmental Assessment Practitioner (EAP)

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), the applicant has appointed Savannah Environmental (Pty) Ltd as the independent environmental consultants responsible for managing the Application for EA and supporting Scoping and Environmental Impact Assessment (S&EIA) process; inclusive of comprehensive, independent specialist studies. The application for EA and S&EIA process will be managed in accordance with the requirements of NEMA, the 2014 EIA Regulations (GNR 326), and all other relevant applicable legislation.

Neither Savannah Environmental nor any of its specialists are subsidiaries of or are affiliated to the applicant. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed facility.

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-based Black Economic Empowerment (B-BBEE) Contributor. Savannah Environmental's team have been actively involved in undertaking environmental studies since 2006, for a wide variety of projects throughout South Africa, including those associated with electricity generation and infrastructure development.

The Savannah Environmental team for this project includes:

» ***Rendani Rasivhetshele*** is the principle author of this report. She is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA), and she holds a Bachelor of Science Honours in Environmental Management. She has over 4 years of experience in conducting Environmental Impacts Assessments, public participation, and Environmental Management Programme for a wide range of projects including renewable energy projects. She is responsible for overall compilation of the report, this includes specialists' engagements, reviewing specialists reports and incorporating specialist studies into the Environmental Impact Assessment report and its associated Environmental Management.

» ***Jana de Jager*** is the co-author of this report. She holds a bachelor's degree in Environmental Science, an Honours degree in Geography and Environmental Science and is currently undertaking her MSc in Ecological Water Requirements. She has 3.5 years of experience in the environmental management field. Her key focus is on undertaking environmental impact assessments, GIS mapping, public participation, environmental management plans and programmes. She is registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).

» **Karen Jodas** holds a Master of Science Degree from Rhodes University and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past 20 years. She has successfully managed and undertaken EIA processes for infrastructure development projects throughout South Africa.

» **Nicolene Venter** has over 20 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

Curricula Vitae (CVs) detailing Savannah Environmental team's expertise and relevant experience are provided in **Appendix A**.

1.6 Details of the Independent Specialist Team

In order to adequately identify and assess potential impacts associated with the project, a number of specialists have been appointed as part of the project team and have provided specialist input into this Scoping Report (refer to **Table 1.2**). CVs detailing the independent specialists' expertise and relevant experience are provided in **Appendix A**.

Table 1.2: Independent Specialists that contribute to the Scoping Report

Company	Specialist Area of Expertise	Specialist Name
Nkurenkuru Ecology & Biodiversity	Ecology and Wetlands	Gerhard Botha
Pachnoda Consulting	Avifauna	Lukas Niemand
Terra Africa Environmental Consultants	Soils and Agricultural Potential	Marinè Pienaar
LOGIS	Visual	Lourens du Plessis
CTS Heritage	Heritage and Palaeontology	Jenna Lavin
Savannah Environmental	Social environment	Nondumiso Bulunga

CHAPTER 2: PROJECT DESCRIPTION

This Chapter provides a description of the Dicoma PV facility and associated infrastructure proposed for development. It must be noted that the project description presented in this Chapter may change to some extent based on the outcomes and recommendations of detailed engineering and other technical studies, the findings and recommendations of the EIA and supporting specialist studies, and any licencing, permitting, and legislative requirements.

2.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(d)(ii) a description of the activities to be undertaken including associated structures and infrastructure	A description of the associated infrastructure is included in **Section 2.4**. Activities to be undertaken during the various project development phases is included in **Section 2.6**.
(g)(ix) the outcome of the site selection matrix	Refer to **Section 2.3** for a description of the selection of the proposed project site and development area.

2.2 Project and Site Description

A study area has been identified for the development of Dicoma PV facility. The study area is located within ward 16 of the Ditsobotla Local Municipality with the Ngaka Modiri Molema District Municipality In the North West Province. It is within the study area that the development area for Dicoma PV facility has been identified and located. The total extent of the affected properties is 552ha in extent (within which the development area of ~176ha will be placed), and it is located 5km north-west of the town Lichtenburg. The development area can be accessed via the R505 existing regional road.

The solar PV facility will comprise several arrays of PV panels and associated infrastructure and will have a contracted capacity of up to 75MW. A study area consisting of the farms Portion 1, Portion 9 and Portion 10 of the Farm Houthaalboomen 31 is being considered for the Dicoma PV facility. A development area[4] of 176ha has been identified within the study area for the construction and operation of the Dicoma PV facility and its associated infrastructure, which is assessed within this Scoping Report. The grid connection for the facility will consist of underground cabling, a facility substation, an Eskom switching substation, and loop-in-loop out power line into an existing Eskom power line. The grid connection infrastructure between the facility and the Eskom grid connection point is considered within a 100m corridor located on the southern boundary of Portion 1 of the Farm Houthaalboomen 31, with a LILO connection traversing Portion 0 of Farm Talene 25 and Portion 7 of Farm Elandsfontein 34.

[4] The development area is that identified area (located within the project site) where the Dicoma PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~176ha in extent.

It must be noted that the development area identified for Dicoma PV facility is located on a site which previously received EA for the development of Watershed PV (Phase 1) (DEA Ref: 14/12/16/3/3/2/556 and (Phase 2) (DEA Ref: 14/12/16/3/3/2/557) Solar Photovoltaic energy facilities. The previous applicant of the project allowed the validity of the EA to lapse, which has made the area available to undertake a new EIA process for a different solar development.

The full extent of the development area has been considered within this Scoping Report with the aim of determining the suitability from an environmental and social perspective and identifying areas that should be avoided in development planning. Within this identified development area, a development footprint[5] will be defined based on the findings of the Scoping Study and will be further assessed during the EIA Phase.

From a technical perspective, the Lichtenburg area is considered favourable for the development of commercial solar energy facilities by virtue of the prevailing climatic conditions, relief and aspect, the extent of the project site and development area, the availability of a direct grid connection (i.e. point of connection to the national Eskom grid), and the availability of land on which development can take place.

The type of technology selected for implementation, will be based on the outcomes of the EIA process, and the completion of additional technical studies (e.g. geotechnical and other surveys) to be conducted as part of the detailed design phase and will ultimately influence the final project layout and development footprint. The extent of the development area under investigation allows for layout design and site-specific alternatives to be identified considering the environmental sensitivities present.

Grid connection infrastructure for the Dicoma PV facility will be located outside the PV development area however, within the project site within a 100m corridor. Two grid connections have been assessed and include:

Grid Connection Alternative 1: 33kV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other approximately 1.3km east of the eastern boundary of the Dicoma PV facility development area, on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the Delareyville Munic–Watershed 1 88kV[6] . The grid connection infrastructure is located within an assessment corridor 100m in width.

Grid Connection Alternative 2: 33kV MV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other and infringes on the eastern boundary of the Dicoma PV facility development area, on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the Delareyville Munic–Watershed 1 88kV. The grid connection infrastructure is located within an assessment corridor of 100m wide in width.

Refer to Figure 2.1 for a map of the Dicoma PV facility development area, including the grid connection alternatives.

[5] The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for Dicoma PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

[6] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, Dudfield-Watershed 1 88kV and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

Table 2.1 provides the details of Dicoma PV facility, including the main infrastructure components and services that will be required during the project life cycle.

Table 2.1: Details of Dicoma PV facility and associated infrastructure. Specific details to be confirmed in the EIA Phase

Component	Description / Dimensions
Total extent of the Affected Properties, also referred to as the project site	~552
Total extent of the PV Development area	~179ha
Contracted capacity of the facility	75MW
Technology	Monofacial or Bifacial PV panels, mounted on either fixed-tilt, single-axis tracking, and/or double-axis tracking systems
PV panels	» Height: ~5.5m from ground level (installed). » Between 200 000 – 300 000 panels required.
Facility Substation	» On-site facility substation with a 132kV capacity located within Portion 1 of the Farm Houthaalboomen 31. » Approximately 1ha in extent.
Eskom Switching Station	» Eskom switching station with a 132kV capacity located within Portion 1 of the Farm Houthaalboomen 31. » Approximately 1ha in extent
Grid Connection	» A 100m wide grid connection corridor within which the grid connection infrastructure will be constructed and operated. » 33kV cabling connecting PV array to facility substation » A loop-in-loop-out overhead 132kV powerline is required for grid connection.
Site and internal access	» Access to the project site will be via the R505 regional road. » An 8m wide main gravel/hard surfaced access road will be constructed to provide direct access to the development area. A network of gravel internal access roads, each with a width of up to 5m will be constructed to provide access to the various components of the Dicoma PV facility development.
Temporary Laydown area	» Up to 5ha
Permanent laydown area	» Less than 1 ha will remain in place for operation

Other infrastructure	» Battery Energy Storage System (BESS) » Operations and Maintenance buildings » Gate house » Security building » Control centre » Office buildings » Warehouse » Workshop » Visitor's centre
Services required	» Refuse material disposal - all generated refuse material will be collected by a private contractor and will be disposed of at a licensed waste disposal site off site. This service will be arranged with the municipality when required. » Sanitation –. All sewage/effluent water will be managed utilising temporary portable chemical toilets. Any other effluent discharge during construction will be stored in sealed containers/tanks and collected (honey-sucker) and treated by a service provider (the LM/ Contractor) at an approved facility off site. These facilities will be maintained and serviced regularly by an appropriate waste contractor. » Water supply – construction water will be sourced from the Ditsobotla Local Municipality (by truck or via pipeline) or from groundwater abstraction. » Electricity supply – approximately 15MW of power may be required during the construction phase. It is proposed that this power be sourced from the existing power lines and/or diesel generators. The necessary applications for the connection to the grid will be submitted to Eskom for approval. » The man camp will require the necessary services such as potable water, electricity and a package plant for waste.

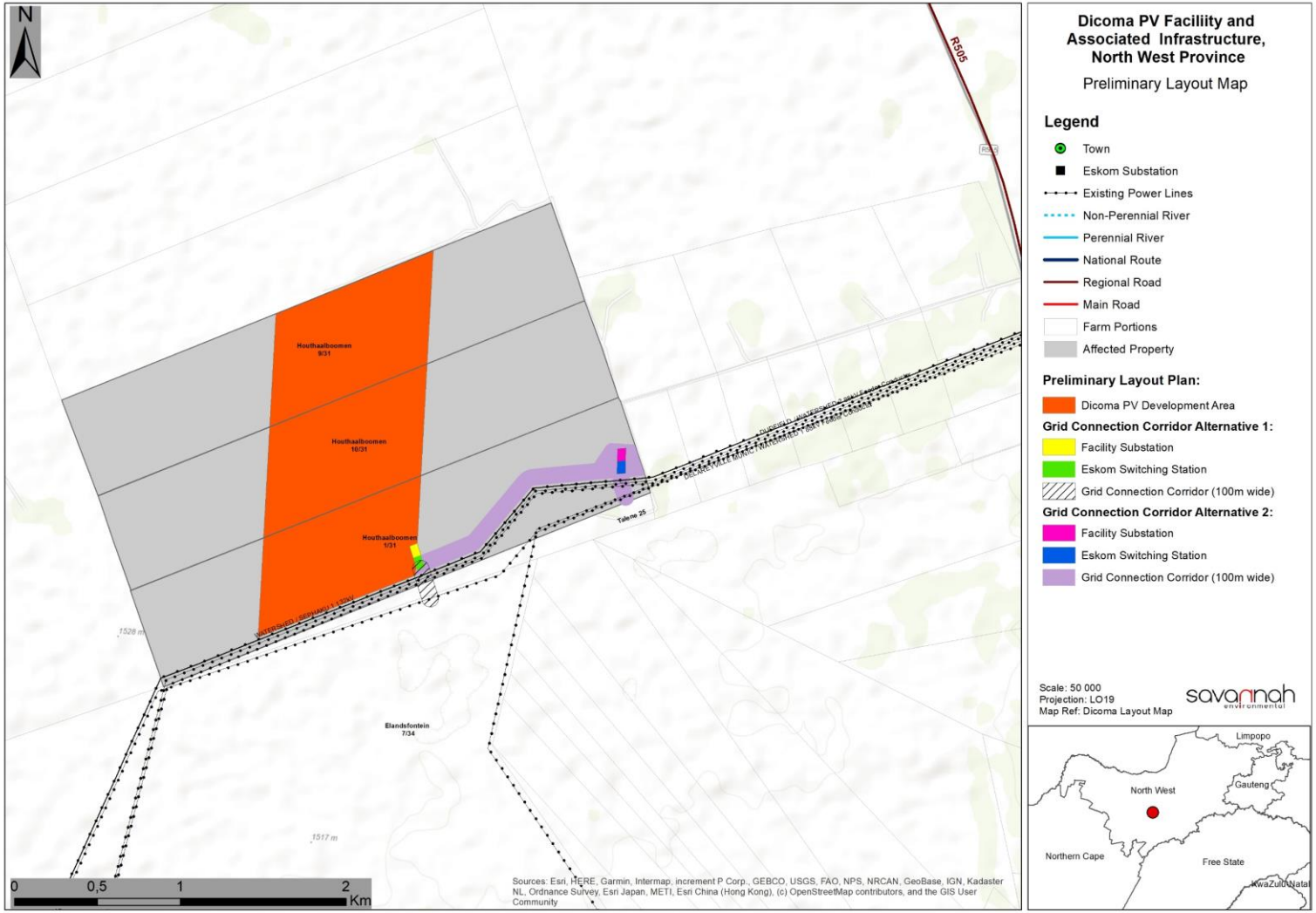

Figure 2.1: Map of the proposed Dicoma PV facility development area and grid connection alternatives

2.3 Summary of Site Selection Process

The broader study area (i.e. the greater Lichtenburg area) was identified by the applicant as having the potential for the installation of a PV facility on the basis of key technical criteria being met, including the solar resource, accessibility of the site, accessibility to the Eskom grid, and local site topography. The North West receives high daily GHI in South Africa, with the Lichtenburg area at approximately 2143 kWh/m^2/annum. Other activities present within the surrounding areas include power line servitudes associated with the existing and approved grid infrastructure, agricultural activities and the future development of other solar PV facilities that have received EA.

The detail regarding site-specific characteristics which aided the selection of the project site is provided below:

Project site extent, conditions and land availability: Availability of relatively level land of sufficient extent can be a restraining factor to PV development, as a 75 MW solar PV development and associated infrastructure requires sufficient land space. The development area, within which the project development footprint will be located, is ~ 179ha. This area is considered to be sufficient for the planned 75MW PV facility and provides an opportunity for the avoidance of sensitive environmental features and areas.

The following are key considerations in this regard:

- The region within which the project site is located can be described gently undulating topography, with slopes of less than 5% over most of the area, and with an average elevation of ~1500m above sea level. Therefore, the project site and development area conditions are optimal for a development of this nature, with the site being of a suitable gradient for the development of a PV facility.

Site access: The area in which the project site is located can be readily accessed via the N14 national route. The N14 national route provides access to the area from Upington, Pofadder, Springbok and Johannesburg. From the N14, access to the project site can be obtained via the R505 regional road. Within the facility development area itself, access will be required from new / existing roads for construction purposes (and limited access for maintenance during operation). The final layout will be determined following the identification of site related sensitivities.

Land use considerations: The majority of land in the Lichtenburg area is agriculture and land reserved for related mining activities. The Remaining Extent of Portion 1, Portion 9 and Portion 10 of Farm Houthaalboomen No 31 are one of the few available privately-owned land parcels with sufficient space available for solar PV development. Within the proposed Dicoma PV facility project site, there is no cultivated agricultural land, and the land is currently used for livestock grazing.

Grid connection considerations: Ease of access into the Eskom national electricity grid is vital to the viability of a solar energy facility and addresses Eskom's concerns for lower cost connection alternatives given current funding constraints. Dicoma PV facility is intended to connect to the National Grid via a loop-in and loop out (LILO) from the Eskom switching station into one of the existing Delareyville Munic–Watershed 1 88kV^2 power line to the south of the site. Having a grid connection point in close proximity to the project site (< 15km) reduces the necessary grid infrastructure and therefore addresses Eskom's concerns for lower cost connection alternatives given current funding constraints. A shorter grid solution will also ensure that potential environmental impacts are kept to a minimum.

Considering the above, the project site was identified and considered acceptable in terms of the investigations which have come before. The development area has been identified by the developer as a suitable area within which the solar PV facility can be placed from a technical perspective.

2.4 Description of the Associated Infrastructure

2.4.1 Details of the proposed project infrastructure

Dicoma PV facility will be designed to have a contracted capacity of up to 75MW. The project will make use of fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology. Monofacial or bifacial panels are both considered. PV technology forms part of the energy mix as indicated in the latest IRP for South Africa.

Once installed, the panels will stand less than 5.5 m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground. If centralised inverter stations are used, Medium Voltage (MV) distribution transformers are located internally, whereas string inverters are mounted at the end of tracker tables. The main transformer capacity varies according to detailed design and project-specific requirements.

2.4.2 Water Supply

Dicoma PV facility will utilise water during both the construction and operation phases of development. Water is required during construction for dust suppression, and potable water will be required on site for the construction crew. During operations, water is required to clean the PV panels, for human consumption, and for use in the auxiliary buildings (i.e. for use in the office building, ablutions, and canteen). Approximately 16 000m³ of water may be required over a 12 to 18-month period during construction, and approximately 5 000m³ of water may be required per year over the 20-year operational lifespan of the project.

A request for confirmation of water availability for the construction and operation of the solar energy facility will be submitted to the Ditsobotla Local Municipality during the EIA process.

2.4.3 Energy Storage

The general purpose and utilisation of the Battery Energy Storage System (BESS) will be to save and store excess electrical output from the facility as it is generated, allowing for a timed release to the national grid when the capacity is required. The BESS will, therefore, provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand and will allow for longer generating periods of the solar PV facility. Furthermore, the development of the BESS for the project is of importance as the system will ensure that electricity is fed into the national grid when required and excess amounts stored. This will allow for extended hours of generation from the 75MW solar energy facility. The BESS will be contained within insulated containers and will connect to the on-site facility substation via underground cabling which will follow the internal access roads of the facility. **Figure 2.2** provides a general illustration of a BESS.

Figure 0.2: Example of battery storage units installed by Tesla (Source: fastcompany.com)

2.4.4 Panel Cleaning

It is anticipated that the PV panels will be washed twice a year during operation. Only clean water (i.e. with no cleaning products), or non-hazardous biodegradable cleaning products will be utilised for the washing of panels. Wastewater generated by washing panels will either be collected and recycled for future use, or alternatively, in the event that an environmentally friendly non-hazardous biodegradable cleaning product is utilised, wastewater can be allowed to run-off under the panels.

2.4.5 Effluent and Wastewater

During construction, chemical toilets will be used. These will be serviced regularly, and effluent will be disposed of at a registered wastewater treatment works. Any other effluent discharge during construction will be stored in sealed containers/tanks and collected (honey-sucker) and treated by a service provider (the LM/ Contractor) at an approved facility off site. These facilities will be maintained and serviced regularly by an appropriate waste contractor.

A request for confirmation of WWTW capacity to treat effluent generated during the construction and operation of the solar energy facility will be submitted to the Ditsobotla Local Municipality during the EIA process.

2.4.6 Waste

Solid waste generated during construction will mainly be in the form of construction material, excavated substrate and domestic solid waste. Waste will be disposed of in either waste skips and/or scavenger proof recycling bins (where possible) and temporarily placed in a central location for removal by an appropriate contractor. Where possible, waste will be recycled. Non-recyclable solid construction waste will be temporarily held in skips or other appropriate waste containers to be disposed of at an appropriately licensed landfill site. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility.

During construction, use of the following hazardous substances are anticipated: paint, grease, petrol / diesel for trucks, cranes, bulldozers etc. Limited amounts of transformer oils and chemicals. Dangerous goods

required to be stored during construction (e.g. limited quantities of fuel, oil, lubricants etc.) will be stored in compliance with relevant legislation (i.e. stored on covered and bunded areas / bin, and disposed of at a registered hazardous waste site). Hazardous waste will be appropriately stored and disposed of.

2.5 Technology considered for the Solar Energy Facility and the Generation of Electricity

Dicoma PV facility will have a contracted capacity of 75MW and will make use of PV technology. Solar energy facilities, which utilise PV technology, use the energy from the sun to generate electricity through a process known as the Photovoltaic Effect. This effect refers to photons of light colliding with electrons, and therefore placing the electrons into a higher state of energy to create electricity (refer to **Figure 2.3**).

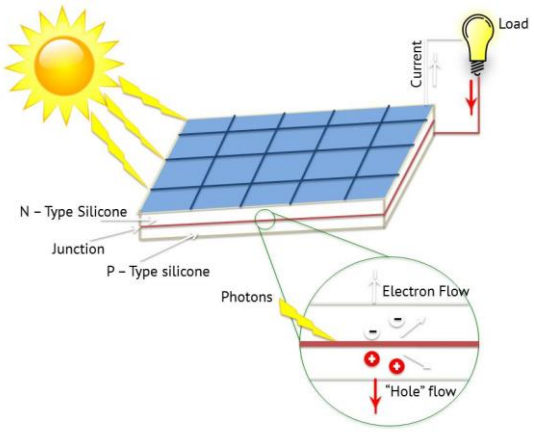

Figure 0.3: Diagram illustrating the Photovoltaic Effect (Source: Centre for Sustainable Energy)

The Photovoltaic Effect is achieved through the use of the following components:

Photovoltaic Cells

A PV cell is made of silicone that acts as a semi-conductor used to produce the Photovoltaic Effect. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV panel (refer to **Figure 2.4**). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e. Direct Current (DC[7])).

[7] DC (direct current) is the unidirectional flow or movement of electric charge carriers (which are usually electrons). The intensity of the current can vary with time, but the general direction of movement stays the same at all times. As an adjective, the term DC is used in reference to voltage whose polarity never reverses. In a DC circuit, electrons emerge from the negative, or minus, pole and move towards the positive, or plus, pole. Nevertheless, physicists define DC as traveling from plus to minus. (sourced from https://whatis.techtarget.com/definition/DC-direct-current).

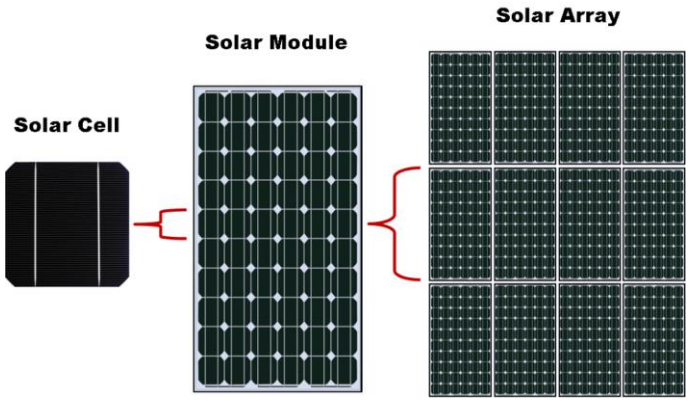

Figure 0.4: Overview of a PV cell, module and array / panel (Source: pveducation.com)

Support Structures

PV panels will be fixed to a support structure. PV panels can either utilise fixed/static support structures, or single or double axis tracking support structures (refer to **Figure 2.5**). PV panels which utilise fixed/static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation. With fixed/static support structures the angle of the PV panel is dependent on the latitude of the proposed development and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

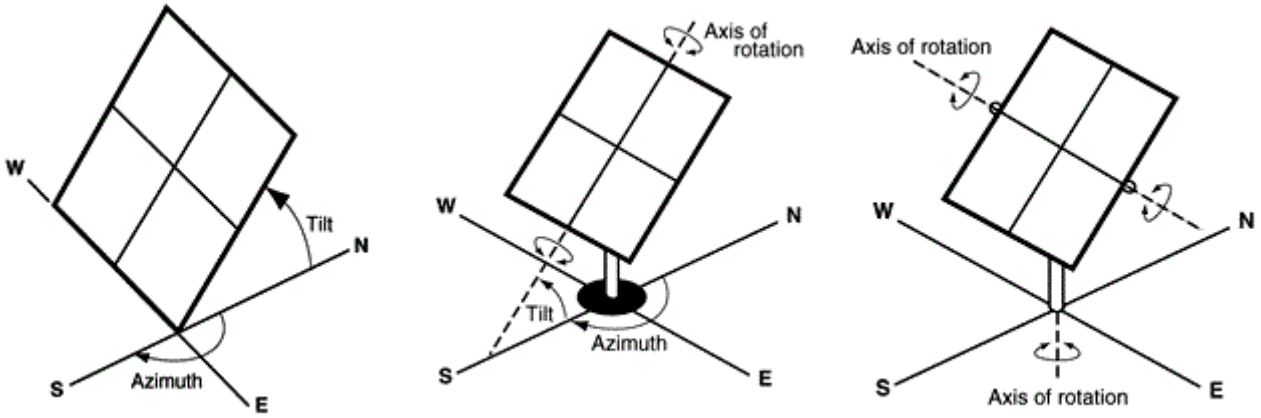

Figure 0.5: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

PV panels are designed to operate continuously for more than 25 years, mostly unattended and with low maintenance.

2.6 Activities during the Project Development Stages

A series of activities are proposed as part of the design, pre-construction, construction, operation, and decommissioning phases associated with the development of Dicoma. These are discussed in more detail under the respective sub-headings below.

2.6.1 Design and Pre-Construction Phase

Planning: Several post-authorisation factors are expected to influence the final design of the solar energy facility and could result in small-scale modifications of the PV array and/or associated infrastructure. An objective of the Engineering, Procurement and Construction (EPC) Contractor, who will be responsible for the overall construction of the project, will be to comply with the approved facility design as far as possible. It should be understood however, that the construction process is dynamic and that unforeseen changes to the project specifications may take place. This Scoping Report therefore describes the project in terms of the best available knowledge at the time. The final facility design is required to be approved by the DFFE. Importantly, should there be any substantive changes or deviations from the original scope or layout of the project, the DFFE will need to be notified and where relevant, environmental approval obtained.

Conduct Surveys: Prior to initiating construction, a number of surveys will be required including, but not limited to, confirmation of the micro-siting footprint (i.e. the precise location of the PV panels, on-site facility substation and the associated infrastructure) and a geotechnical survey. Geotechnical surveys acquire information regarding the physical characteristics of soil and rocks underlying a proposed project site and informs the design of earthworks and foundations for structures.

2.6.2 Construction Phase

The construction phase will take approximately 12 to 18 months to complete, and will entail a series of activities including:

Procurement and employment

At the peak of construction, the project is likely to create a maximum of 350 employment opportunities. These employment opportunities will be temporary and will last for a period of approximately 12 to 18 months (i.e. the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of high levels of unskilled and semi-skilled labour so there will be good opportunity to use local labour, where available. Employment opportunities will peak during the construction phase and significantly decline during the operation phase. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. The majority of the labour force is expected to be sourced from the surroundings towns.

Establishment of an Access Road

Access to the development area will be established for the construction and operation of Dicoma PV facility. Access to the project site is via the R505 regional road. Within the development footprint itself, access will be required from new/existing roads for construction purposes (and limited access for maintenance during operation). The final layout will be determined following the identification of site related sensitivities.

Undertake Site Preparation

Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and/or spread on site.

Transport of Components and Equipment to Site

The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase. Some of the components (i.e. substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93

of 1996) (NRTO)[8] by virtue of the dimensional limitations. Typical civil engineering construction equipment will need to be brought to the project site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the on-site facility substation and site preparation.

Establishment of Laydown Areas on Site

Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown area will need to be established adjacent to the workshop area. The equipment construction camp serves to confine activities and storage of equipment to one designated area, to limit the potential ecological impacts associated with this phase of the development. The laydown area will be used for the assembly of the PV panels, and the general placement/storage of construction equipment. It is anticipated that the temporary laydown area will be included within development footprint of the solar facility.

Erect PV Panels and Construct Substation and Invertors

The construction phase involves installation of the PV solar panels, structural and electrical infrastructure required for the operation of Dicoma. In addition, preparation of the soil and improvement of the access roads are likely to continue for most of the construction phase. For array installations, vertical support posts will be driven into the ground. Depending on the results of the geotechnical report, a different foundation method, such as screw pile, helical pile, micropile or drilled post/piles could be used. The posts will hold the support structures (tables) on which the PV modules would be mounted. Brackets will attach the PV modules to the tables. Trenches are to be dug for the underground AC and DC cabling, and the foundations of the inverter enclosures and transformers will be prepared. While cables are being laid and combiner boxes are being installed, the PV tables will be erected. Wire harnesses will connect the PV modules to the electrical collection systems. Underground cables and overhead circuits will connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure, and ultimately the facility substation.

The construction of the on-site facility substation will require a survey of the footprint, site clearing and levelling and construction of access road(s) (where applicable), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas, and protection of erosion sensitive areas.

Establishment of Ancillary Infrastructure

The establishment of the ancillary infrastructure and support buildings will require the clearing of vegetation and levelling of the development footprint, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required.

Undertake Site Rehabilitation

Once construction is completed and all construction equipment has been removed, the development enveloped will be rehabilitated where practical and reasonable. In addition, on full commissioning of Dicoma, any access points which are not required during operation must be closed and rehabilitated accordingly.

2.6.3 Operation Phase

[8] A permit will be required in accordance with Section 81 of the National Road Traffic Act (No. 93 of 1996) (NRTA) which pertains to vehicles and loads which may be exempted from provisions of Act.

Dicoma is expected to operate for a minimum of 20 years. The facility will operate continuously, 7 days a week, and will include battery storage. While the solar facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Maintenance (O&M) plan include monitoring and reporting the performance of the solar energy facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

The operation phase will create approximately 50 full-time equivalent employment positions which will include low-skilled, semi-skilled and skilled personnel. Employees that can be sourced from the local municipal area include the less skilled and semi-skilled personnel (such as safety and security staff and certain maintenance crew). Highly skilled personnel may need to be recruited from outside the local area where these resources are not available within the area.

2.6.4 Decommissioning Phase

Depending on the continued economic viability of Dicoma PV following the initial 20-year operation lifespan, the solar energy facility will either be decommissioned, or the operation phase will be extended. If it is deemed financially viable to extend the operation phase, existing components would either continue to operate or be dissembled and replaced with new, more efficient technology / infrastructure available at the time. If the decision is made to decommission the facility, the following decommissioning activities will take place:

Site Preparation
Site preparation activities will include confirming the integrity of the access to the site to accommodate the required decommissioning equipment.

Disassembly and removal of existing components
When the solar energy facility is ultimately decommissioned, the equipment to be removed will depend on the land use proposed for the project site at the time. All above ground facilities that are not intended for future use will be removed. Much of the above ground wire, steel, and PV panels of which the system is comprised are recyclable materials and would be recycled to the extent feasible. The components of the solar energy facility would be de-constructed and recycled or disposed of in accordance with applicable regulatory requirements. The site will be rehabilitated where required and can potentially be returned to a beneficial land-use.

Future plans for the site and infrastructure after decommissioning
The generation capacity of the facility would have degraded by approximately 15% over the 20-year operational lifespan. The solar energy facility will potentially have the opportunity to generate power for a Merchant Market operation (i.e. the client would sell power on a bid basis to the market). Another option for the site after decommissioning is for agricultural activities to resume.

CHAPTER 3: POLICY AND LEGISLATIVE CONTEXT

This Chapter provides an overview of the policy and legislative context within which the development of a solar PV facility is proposed. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed project.

3.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter of the Scoping Report includes the following information required in terms of Appendix 2: Content of Scoping Report:

Requirement	Relevant Section
(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 are to be considered in the assessment process.	Chapter 4 provides an overview of the policy and legislative context which is considered to be associated with the development of the Dicoma PV facility. The regulatory and planning context has been considered at national, provincial and local levels. A description of the policy and legislative context within which Dicoma PV facility is proposed is included in **sections 3.3, 3.4, 3.5** and **3.6.**

3.2 Strategic Electricity Planning in South Africa

The need to expand electricity generation capacity in South Africa is based on national policy and informed by on-going strategic planning undertaken by the Department of Mineral Resources and Energy (DMRE). The hierarchy of policy and planning documentation that support the development of renewable energy projects such as a solar energy facility is illustrated in **Figure 3.1**. These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the development of Dicoma PV facility.

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels. As solar energy developments are a multi-sectoral issue (encompassing economic, spatial, biophysical, and cultural dimensions) various statutory bodies are likely to be involved in the approval process of a solar energy project and the related statutory environmental assessment process.

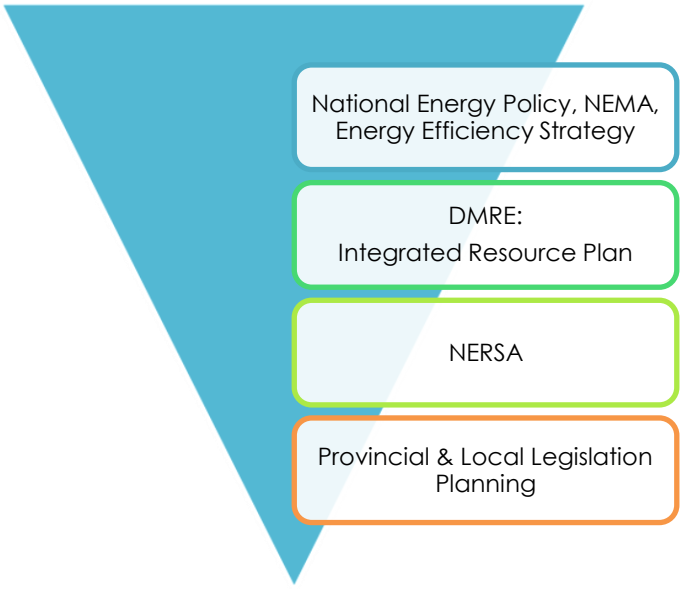

Figure 3.1: Hierarchy of electricity and planning documents

At **National Level**, the main regulatory agencies are:

- **Department of Mineral Resources and Energy (DMRE):** This Department is responsible for policy relating to all energy forms and for compiling and approving the Integrated Resource Plan (IRP) for electricity. Furthermore, the Department is also responsible for granting approvals for the use of land which is contrary to the objects of the Mineral and Petroleum Resource Development Act (Act No. 28 of 2002) (MPRDA) in terms of Section 53 of the Act. Therefore, in terms of the Act, approval from the Minister is required to ensure that proposed activities do not sterilise mineral resources that may occur within the project site and development area.
- **National Energy Regulator of South Africa (NERSA):** NERSA is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.
- **Department of Forestry, Fisheries, and the Environment (DFFE):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations, 2014 (GN R326) as amended. DFFE is the Competent Authority for this project (as per GN R779 of 01 July 2016), and is charged with granting the EA for the project under consideration.
- **The South African Heritage Resources Agency (SAHRA):** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- **South African National Roads Agency Limited (SANRAL):** This Agency is responsible for the regulation and maintenance of all national road routes.
- **Department of Human Settlements, Water and Sanitation (DHSWS):** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e. Water Use Licenses (WUL) and General Authorisation).
- **The Department of Agriculture, Land Reform, and Rural Development (DALRRD** This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agriculture sector

At **Provincial Level**, the main regulatory agencies are:

- **Provincial Government of the North West – *North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT)*:** This Department is the commenting authority for the EIA process for the project and is responsible for issuing of biodiversity and conservation-related permits. DEDECT's involvement relates specifically to sustainable resource management, conservation of protected species and land care.
- ***North West Department of Public Works and Roads (NW DPWR)*:** NW DPWR is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- ***North West Provincial Heritage Resources Agency (NW PHRA):*** NW PHRA, the North West Provincial Heritage Resources Authority is responsible for the identification, conservation and management of heritage resources, as well as commenting on heritage related issues within the province.
- ***North West Department of Community Safety and Transport Management (NW DCSTM):*** This Department provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

At the **Local Level,** the local and district municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the North West Province, both the local and district municipalities play a role. The local municipality includes the Ditsobotla Local Municipality which forms part of the Ngaka Modiri Molema District Municipality. In terms of the Municipal Systems Act (No. 32 of 2000), it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control.

The relevant legislation and policies listed and discussed below are relevant to the Dicoma PV facility development.

3.3 Policy and Planning Considerations on International, National, Provincial and Local Levels

3.3.1 Policy and planning on an International Level

South Africa has committed to various international policies which relate to environmental concerns, specifically that of climate change and global warming. **Table 3.1** below provides a summary of the international policies and plans that South Africa has made commitments towards, and how the proposed development of the Dicoma PV facility aligns with the thinking or commitments of these agreements.

Table 3.1: International policies and plans relevant to the Dicoma PV facility

Policy or Plan	Is the development of the Dicoma PV facility aligned with this policy or plan?
The Kyoto Protocol, 1997	Yes. The protocol calls for the reduction of South Africa's greenhouse gas emissions through actively cutting down on using fossil fuels, or by utilising more renewable resources. The development of Dicoma PV facility will enable the evacuation of additional capacity to the renewable energy sector of the country and strengthen the commitment and action plan to achieve the requirements as set out in the protocol.
United Nations Framework Convention on Climate Change and COP21 – Paris Agreement	Yes. South Africa supports the adoption of the Paris Agreement which has the main objective of addressing the climate change issue and marks the first international political response to climate change. South Africa has set out a goal of 17GW of renewable energy by 2030 within the IRP of 2019. Through the development of renewable energy projects (including Dicoma PV facility) additional renewable energy will be made available to the country, which in turn will demonstrate the contribution that South Africa is making to the global response to climate change specifically relating to the development of the renewable energy sector.

Policy or Plan	Is the development of the Dicoma PV facility aligned with this policy or plan?
The Equator Principles 4 (October 2020)	Yes. The Equator Principles 4 constitute a financial industry benchmark used for determining, assessing, and managing a project's environmental and social risks. The Equator Principles (Eps) are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are applicable to large infrastructure projects and apply globally to all industry sectors. In terms of the EPs, South Africa is a non-designated country, and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability and Environmental Health and Safety (EHS) Guidelines. The Dicoma PV facility is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended (GNR 326), published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.
International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, January 2012	Yes. The overall objectives of the IFC performance standards are to fight poverty, do no harm to people or the environment, fight climate change by promoting low carbon development, respect human rights, promote gender equality, provide information prior to project development, collaborate with the project developer in order to achieve the performance standard, provide advisory services and notify countries of trans boundary impacts. When considering the development of the grid connection infrastructure associated with the development of Dicoma PV facility the following performance standards are anticipated to be applicable at this stage of the BA process: » *Performance Standard 1:* Assessment and Management of Environmental and Social Risks and Impacts » *Performance Standard 2:* Labour and Working Conditions » *Performance Standard 3:* Resource Efficiency and Pollution Prevention » *Performance Standard 4:* Community Health, Safety and Security » *Performance Standard 6:* Biodiversity Conservation and Sustainable Management of Living Natural Resources » *Performance Standard 8:* Cultural Heritage

3.3.2 Policy and planning on a National Level

Further to the South African government's commitment in August 2011 to support the development of renewable energy capacity, the DMRE initiated the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) to procure renewable energy from the private sector in a series of rounds. To date, the Department has procured 6 422MW of renewable energy capacity from 112 independent power producers (IPPs), with 4 742MW operational and made available to the grid[9]. National policies have to be considered for the construction and operation of the solar PV facility to ensure that the development is in line with the planning of the country.

[9]http://www.nersa.org.za/wp-content/uploads/2021/05/Monitoring-of-Renewable-Energy-Performance-of-Power-Plants-%E2%80%93-Performance-of-Power-Plants-in-2020

A brief review of the most relevant national policies is provided below in **Table 3.2**. The development of Dicoma PV facility is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 3.2: Relevant national legislation and policies relevant to the Dicoma PV facility

Relevant legislation or policy	Relevance to Dicoma PV facility
Constitution of the Republic of South Africa, 1996	Section 24 of the Constitution pertains specifically to the environment. It states 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 that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.
National Environmental Management Act (No. 107 of 1998) (NEMA)	This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights. The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.
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 RE and encouraging new entries into the generation market. The policy states that the advantages of RE 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.
White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	The White Paper on Renewable Energy Policy 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 RE and aims to create the necessary conditions for the development and commercial implementation of RE technologies. The White Paper on RE sets out Government's vision, policy principles, strategic goals, and objectives for promoting and implementing RE in South Africa. The country relies heavily on coal to meet its energy needs due to its abundant, and fairly accessible

Relevant legislation or policy	Relevance to Dicoma PV facility
	and affordable coal resources. However, massive RE resources that can be sustainable alternatives to fossil fuels, have so far remained largely untapped. The White Paper on Renewable Energy of 2003 set a target of 10 000GWh to be generated from RE by 2013 to be produced mainly from biomass, wind, solar and small-scale hydro. The target was subsequently reviewed in 2009 during the RE summit of 2009. The policy supports the investment in RE facilities as they contribute towards ensuring energy security through the diversification of energy supply, reducing GHG emissions and the promotion of RE sources.
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 (REs). The Act provides the legal framework which supports the development of RE 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.
The Electricity Regulation Act (No. of 2006)	The Electricity Regulation Act of 2006, replaced the Electricity Act (No. 41 of 1987), as amended, with the exception of Section 5B, which provides funds for the energy regulator for the purpose of regulating the electricity industry. The Act establishes a national regulatory framework for the electricity supply industry and introduces the National Energy Regulator (NERSA) as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licences and registration as the manner in which the generation, transmission, distribution, trading, and import and export of electricity are regulated.
Integrated Energy Plan (IEP), 2015	The Integrated Energy Plan (IEP) (which was developed under the National Energy Act (No. 34 of 2008)), recognises that energy is essential to many human activities, and is critical to the social and economic development of a country. The purpose of the IEP is essentially to ensure the availability of energy resources, and access to energy services in an affordable and sustainable manner, while minimising associated adverse environmental impacts. Energy planning therefore needs to balance the need for continued economic growth with social needs, and the need to protect the natural environment.
Integrated Resource Plan for Electricity (IRP) 2010-2030 (2019)	The Integrated Resource Plan (IRP) for Electricity 2010 – 2030 is a subset of the IEP 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. On 27 August 2018, the then Minister of Energy published a draft IRP which was issued for public comment. The lengthy public participation and consultation process has culminated in the issue of the overdue IRP 2019 which updates the energy forecast from the current period to the year 2030. Since the promulgated IRP 2010, the following capacity developments have taken place:

Relevant legislation or policy	Relevance to Dicoma PV facility
	» A total of 6 422MW has been procured thus far under the REIPPP Programme, with 3 876MW being currently operational and made available to the grid. In addition, IPPs have commissioned 1005MW from two (2) Open Cycle Gas Turbines (OCGT) peaking plants; and » Under the Eskom Build Programme, 1 332MW has been procured from the Ingula Pumped Storage Project, 1 588MW and 800MW from the Medupi and Kusile power stations and 100MW from the Sere Wind Farm. Provision has been made for the following new capacity by 2030: » 1 500MW of coal; » 2 500MW of hydro; » 6 000MW of solar PV; » 14 400MW of wind; » 1 860MW of nuclear; » 2 088MW of storage; » 3 000MW of gas/diesel; and » 4 000MW from other distributed generation, co-generation, biomass and landfill technologies. Based on the IRP 2019, 1 474MW has been installed for solar PV facilities, whereas, 814MW has already been procured. In addition, 1 000MW has been allocated for solar PV facilities from 2022 to 2030. This will bring the total installed capacity of solar PV facilities by 2030 to 8 288MW. Therefore, the development of the Dicoma PV facility is supported by the IRP 2019.
Renewable Energy Policy in South Africa	Yes. Support for the Renewable Energy Policy is guided by a rationale that South Africa has a very attractive range of renewable energy resources, particularly solar and wind, and that renewable applications are, in fact, the least cost energy service in many cases from a fuel resource perspective (i.e. the cost of fuel in generating electricity from such technology); more so when social and environmental costs are taken into account. However, the National Energy Policy acknowledges that the development and implementation of renewable energy applications has been largely neglected in South Africa. Challenges regarding the implementation of renewable energy have been identified. Through the development of renewable energy projects (including the Dicoma PV facility), additional renewable energy will be made available which will assist with the further growth and development of the renewable energy sector.
National Development Plan 2030 (2012)	The National Development Plan (NDP) 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. In terms of the Energy Sectors role in empowering South Africa, the NDP 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.

Relevant legislation or policy	Relevance to Dicoma PV facility
	The NDP aims to provide a supportive environment for growth and development, while promoting a more labour-absorbing economy. The development of Dicoma PV facility Supports the NDP through the development of energy-generating infrastructure which will not lead to the generation of GHGs and will result in economic development and growth of the area surrounding the development area.
Strategic Integrated Projects (SIPs)	The Presidential Infrastructure Coordinating Commission (PICC) is integrating and phasing investment plans across 18 Strategic Integrated Projects (SIPs) which have 5 core functions, including to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services and support the integration of African economies. SIP 8 of the energy SIPs supports the development of RE projects as follows: 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) and supports bio-fuel production facilities. The development of Dicoma PV facility is aligned with SIP 8 as it constitutes a green energy initiative that would contribute clean energy in accordance with the IRP 2010 – 2030.
New Growth Path (NGP) Framework, 2010	Yes. The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs through the green economy. With economic growth and employment creation as the key indicators identified in the NGP. To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas. The Dicoma PV facility will assist with the creation of both temporary and permanent employment opportunities during the construction and operation phases, which will contribute, albeit to a limited extent, to the economy and sustainable growth.
National Climate Change Response Policy, 2011	The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. This Agreement is open for signature and subject to ratification, acceptance or approval by States and regional economic integration organisations that are Parties to the Convention from 22 April 2016 to 21 April 2017. Thereafter, this Agreement shall be open for accession from the day following the date on which it is closed for signature. The agreement can only be sanctioned once it has been ratified by 55 countries, representing at least 55% of emissions. South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Agreement was promulgated on 04 November 2016, thirty days after the date on which at least 55 Parties to the Convention, which account for at least 55% of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary.

Relevant legislation or policy	Relevance to Dicoma PV facility
	South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. The policy provides support for Dicoma PV, which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner.
Climate Change Bill, 2018	On 08 June 2018, the Minister of Environmental Affairs published the Climate Change Bill ("the Bill") for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. Dicoma PV facility consists of a renewable energy generation facility and would not result in the generation or release of emissions during its operation.

3.3.3 Policy and planning at a Provincial Level

A brief review of the most relevant provincial policies is provided below in **Table 3.3**. The proposed development is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

Table 3.3: Relevant provincial legislation and policies for Dicoma PV

Relevant policy	Relevance to Dicoma PV facility
North West Provincial Development Plan (PDP), 2013 (updated 2017/2022)	The North West Provincial Development Plan (PDP) 2013 (updated 2017/2022) states that the overarching objective, is to overcome certain obstacles relating to the current infrastructure by introducing renewable energy together with energy conservation and efficiency strategies. Furthermore, this will craft a better tomorrow and ensure that underdevelopment, poverty, and inequality is fully addressed in the North West Province. The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments. With the developed and proposed independent power producer capacity (including the Dicoma PV facility), the province will produce its own electrical power needs from renewable energy resources (although this energy will be fed into the national grid).
North West Province Spatial Development Framework (SDF) (2016) – Published 2017	The Spatial Development Framework (SDF) addresses the need for spatial planning, socio-economic development, infrastructure and conservation of natural resources. Key socio-economic issues which would require strategic planning provision include: employment (including youth and women); poverty eradication; attracting investment; economic growth; HIV / AIDS and other diseases; food security; physical infrastructure (including

Relevant policy	Relevance to Dicoma PV facility
	availability of industrial land); illiteracy; tourism development; population growth, urbanization and migration. Natural resource issues include inadequate water resources for future development; bush encroachment and alien invasive species; land and soil degradation; and overgrazing. With regard to spatial planning, the legacies of Apartheid-era policy is identified as a key issue and residents of the North West are consequently extremely underdeveloped. As per the North West Provincial Spatial Development Framework (PSDF) (2017) electricity within the province is primarily provided by Eskom to re-distributors – mainly municipalities (10%), commercial (5%), agriculture (5%), mining (30%), industrial (30%) and Residential (20%). According to the North West PSDF the proposed project site is located within the Mahikeng Distribution Area, which is characterised by minor developments, including Commercial, Industrial, and Major Electrification; and has a projected growth of 125MW (Eskom, 2015). Eskom's Transmission Development Plan 2015 – 2024 represents the transmission network infrastructure investment requirements over the 10 year period between 2015 and 2024. Projects proposed for the North West Province for the next 10 years include the introduction of 400kV power lines and transformation to support or relieve the existing networks. Five transmission power corridors have been identified as critical to providing a flexible and robust network that could respond to meet the needs of future IPPs and IRP requirements. The development of the proposed PV facility and its associated grid connection infrastructure will contribute to economic growth and development, which will in turn help eradicate poverty through job creation and skills development in the region which will be in line with the North West SDF.
Renewable Energy Strategy for the North West Province (2012)	In 2012 the North West Province's then Department of Economic Development, Environment, Conservation and Tourism (DEDECT) developed the Renewable Energy Strategy for the North West Province. The strategy was developed in response to the need of the North West Province to participate meaningfully within South Africa's RE sector. The RE strategy aims to improve the North West Province's environment, reduce its contribution to climate change, and alleviate energy poverty, while promoting economic development and job creation whilst developing its green economy. According to the strategy the North West Province consumes approximately 12% of South Africa's available electricity, and is rated as the country's fourth largest electricity consuming province. This is mainly due to the high demand of the electrical energy-intensive mining and related industrial sector, with approximately 63% of the electricity supplied to the province being consumed in its mining sector. While the strategy recognises that South Africa has an abundance of RE resources available, it is cognisant of the fact that the applicability of these RE resources depend on a number of factors and as a result are not equally viable for the North West Province. The RE sources that were identified to hold the most potential and a competitive strength for the North West Province are Solar Energy (photovoltaic as well as solar water heaters), Municipal Solid Waste, hydrogen and fuel cell technologies, bio-mass, and energy efficiency.

Relevant policy	Relevance to Dicoma PV facility
	The advantages and benefits for the North West Province associated with the implementation and use of RE technologies include: » Provision of energy for rural communities, schools and clinics that are far from the national electricity grid. » Creation of an environment where access to electricity provides rural communities with the opportunity to create an economic base via agricultural and home-based industries and Small, Medium and Micro Enterprises (SMMEs) in order to grow their income-generating potential. » The supply of water within rural communities. » It would result in less time taken for the collection of wood and water, thus improving the quality of life within communities and specifically for women. » Improved health through the reduced use of fuelwood as energy source for cooking and heating that causes respiratory and other hazards. » Solar water heating for households in urban and rural settings, reducing the need for either electricity (in urban settings) and fuelwood (in rural settings) to heat water, thus lowering our National peak demand and conservation of woodlands in a sustainable manner. » Large-scale utilisation of renewable energy will also reduce the emissions of carbon dioxide, thus contributing to an improved environment. » The fact that RE go hand-in-hand with energy efficiency, it will result in additional financial benefit and the need for smaller RE systems. » The development of a strong localised RE industry within the NWP holds substantial potential for Black Economic Empowerment (BEE) and job creation within the Province. » The establishment of a strong RE base in the North West Province, especially in the manufacturing of fuel cells could stimulate the market for Platinum Group Metals (PGM), which would in turn help the local mining sector. This is due to RE sources having considerable potential for increasing security of supply by diversifying the energy supply portfolio and increasingly contributes towards a long-term sustainable energy future. In terms of environmental impacts, RE results in the emission of less GHGs than fossil fuels, as well as fewer airborne particulates, and other pollutants. Furthermore, RE generation technologies save on water consumption in comparison with coal-fired power plants.
North West Provincial Growth and Development Strategy (PGDS) 2004-2014	Goals and objectives of the North West Provincial Growth Development Strategy are to fight poverty and unemployment, improve the low level of expertise and skills which are classified as both immediate and long-term goals and require primary goals for sustained growth and economic development. The proposed facility will contribute to employment creation and skills development which is in line with the goals and objectives of the North West PGDS. The North West Provincial Growth Development Strategy aims at building a sustainable economy to eradicate poverty and improve social development. The proposed Grid infrastructure will contribute to growth and development of the local area by expanding the economic base and creating employment opportunities.

3.3.4 Policy and planning at a Local Level

The local tiers of government relevant to the Dicoma PV facility project are the Ditsobotla Local Municipality and the Ngaka Modiri Molema District Municipality. Instruments and/or policies at both the district and local level contain objectives which align with the development of Dicoma PV facility. These include, economic growth, job creation, community upliftment and poverty alleviation.

Table 3.4: Relevant district and local legislation and policies for Dicoma PV facility

Relevant policy	Relevance to Dicoma PV facility
Ngaka Modiri Molema District Municipality Integrated Development Plan (IDP), 2017-2022	The vision of the Ngaka Modiri Molema District Municipality as contained within its IDP 2017 – 2022 can be summarised as follows: "*Leaders in integrated municipal governance*". The vision of the Ngaka Modiri Molema District Municipality is: "*To provide a developmental municipal governance system for a better life for all*". In recognition of its vision and mission, the Ngaka Modiri Molema District Municipality has adopted the following strategic development goals for the District: » Institutional Transformation and Organisational Development. » Provision of Infrastructure for Basic Service Delivery. » Economic Development. » Financial Viability. » Good Governance. With regards to "Economic Development", the following additional strategic objectives have been identified: » To facilitate economic development by creating a conducive environment for business development. » Unlock opportunities to increase participation amongst all sectors of society in the mainstream economy to ultimately create decent job opportunities. » To promote Local Economic Development » To enhance rural development and agriculture » To Expand Public Works Programme The implementation of Dicoma PV facility would therefore contribute positively towards local economic development, as well as the creation of new job opportunities within the Ngaka Modiri Molema District Municipality.
Ditsobotla Local Municipality Integrated Development Plan (IDP), 2017 – 2018 and draft reviewed 2020-2021	The vision statement for the Ditsobotla LM as contained within the IDP 2017 – 2018 is as follows: "*A developmental municipality dedicated to the social and economic upliftment of its communities*." The Mission Statement of the Ditsobotla LM is as follows: "*Sustainable service delivery through: transparent administration, dedicated staff, implementation of municipal programmes, and consultation with communities*."

Relevant policy	Relevance to Dicoma PV facility

The following key issues and objectives have been identified for the Ditsobotla LM:

Key issues	Key objectives
The municipality's financial position is poor due to inadequate capacity as well as poor finance management controls / systems.	A fully capacitated municipal administration capable of developing and implementing effective financial controls.
The organisational design does not respond to service delivery challenges. There is no adequate capacity in technical functions of the municipality.	Capacitated institution structured in a way that enables efficient and effective service delivery.
High levels of poverty and unemployment, skills shortage, and inequalities within the Ditsobotla LM.	Create an environment conducive for economic growth, sustainable employment opportunities and growth in personal income levels of communities.
Backlogs in the provision of social services, infrastructure, service delivery and economic opportunities.	A well-structured Ditsobotla LM able to support sustainable human settlement and enable residents meets their social and economic needs.

The implementation of Dicoma PV **f**acility would contribute towards addressing the Ditsobotla Local Municipality key issue regarding high levels of poverty and unemployment, skills shortage, and inequalities, through the creation of employment opportunities, the provision of skills training opportunities, and local economic growth, including growth in personal income levels of those community members who would be employed on the project. In addition, the REIPPP Programme requires preferred bidders to make minimum contributions towards local economic development and social upliftment, to be focused on benefitting local communities within the vicinity of the project site.

CHAPTER 4: NEED AND DESIRABILITY & ALTERNATIVES

Appendix 2 of the 2014 EIA Regulations (GNR 326) requires that a Scoping Report includes a motivation for the need and desirability of the proposed development, including the need and desirability of the activity in the context of the preferred location. The need and desirability of the development needs to consider whether it is the right time and the right place for locating the type of land-use/activity being proposed. The need and desirability of a proposed development is, therefore, associated with the wise use of land, and should be able to respond to the question such as, but not limited to, what the most sustainable use of the land may be.

This Chapter provides an overview of the suitability of the Dicoma PV facility being developed at the preferred project location from an international, national, regional, and site-specific perspective. It provides an overview of the need and desirability, and perceived benefits of the project specifically. This Chapter provides an overview of the various alternatives considered for Dicoma PV facility as part of the Scoping Process.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(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;	The need and desirability for the development of Dicoma PV facility is included and discussed within this chapter. The need and desirability for the development of the PV facility has been considered from an international, national, regional and site-specific perspective.
(g)(i) details of all the alternatives considered	The details of the alternatives considered as part of Dicoma PV facility and as part of the Scoping Phase have been included in **Section 4.7**.
(g)(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such	The details of the alternatives considered as part of Dicoma PV facility and as part of the Scoping Phase have been included in **Section 4.7**. Where no alternatives are being considered a motivation has been included.

4.2 Need and Desirability from an International Perspective

The need and desirability of Dicoma PV facility, from an international perspective, can be described through the project's alignment with internationally recognised and adopted agreements, protocols and conventions. South Africa is a signatory to a number of international treaties and initiatives, including the United Nation's Development Programme's (UNDP's) Sustainable Development Goals (SDGs). The SDGs address global socio-economic challenges such as poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanisation, environment and social justice. The SDGs consist of 17 global goals set by the United Nations. The 17 SDGs are characterised by 169 targets, and 304 indicators.

Goal 7 of the SDGs relates to "Affordable and Clean Energy", with the aim of the goal being to ensure access to affordable, reliable, sustainable and modern energy for all. The following targets and indicators have been set for Goal 7:

Targets		Indicators	
7.1	By 2030, ensure universal access to affordable, reliable and modern energy services.	7.1.1 7.1.2	Proportion of population with access to electricity. Proportion of population with primary reliance on clean fuels and technology.
7.2	By 2030, increase substantially the share of renewable energy in the global energy mix.	7.2.1	Renewable energy share in the total final energy consumption.
7.3	By 2030, double the global rate of improvement in energy efficiency.	7.3.1	Energy intensity measured in terms of primary energy and GDP.
7.A	By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.	7.A.1	Mobilised amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment.
7.B	By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.	7.B.1	Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services.

The development of Dicoma PV facility would contribute positively towards Goal 7 of the SDGs through the following:

- By generating up to 75MW_{AC} of affordable and clean energy.
  - A study published by the CSIR on 14 October 2016 ("Cost of new power generators in South Africa Comparative analysis based on recent Independent Power Producer (IPP) announcements", Dr Tobias Bischof-Niemz and Ruan Fourie) which took into consideration the results of the cost prices bid successfully under the Department of Mineral Resources and Energy's Renewable Energy (RE) IPP and Coal Baseload IPP Procurement Programmes, found that solar PV and wind were 40% cheaper than new baseload coal (i.e. R0.62/kWh for PV and wind vs R1.03 for coal).
  - PV technology is one of the cleanest electricity generation technologies, as it does not result in the release of emissions during its operation.
- By contributing towards South Africa's total generation capacity, specifically through the utilisation of renewable energy resources.

4.3 Need and Desirability from a National Perspective

Dicoma PV facility is proposed in specific response to a National Government initiative, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). This programme was initiated in order to give effect to the requirements of the IRP with regards to renewable energy targets. As a result, the need and desirability of the Dicoma PV facility from a national perspective can largely be linked from the project's alignment with national government policies, plans, and programmes which have relevance to

energy planning and production (as discussed in detail in **Chapter 3**). The following key plans have been developed by National Government to consider South Africa's current energy production, projected future demands, and provides the necessary framework within which energy generation projects can be developed:

» Integrated Energy Plan (IEP)
» Integrated Resource Plan (IRP)

The above-mentioned energy plans have been extensively researched and are updated on an on-going basis to take into consideration changing scenarios, new information, developments in new technologies, and to reflect updated demands and requirements for energy production within the South African context. These plans form the basis of South Africa's energy generation sector and dictate national priorities for energy production.

The IEP is intended to provide a roadmap of South Africa's future energy landscape and guide future energy infrastructure investments and policy development. The Plan considered the three pillars of sustainable development, and list the following as the eight key energy planning objectives:

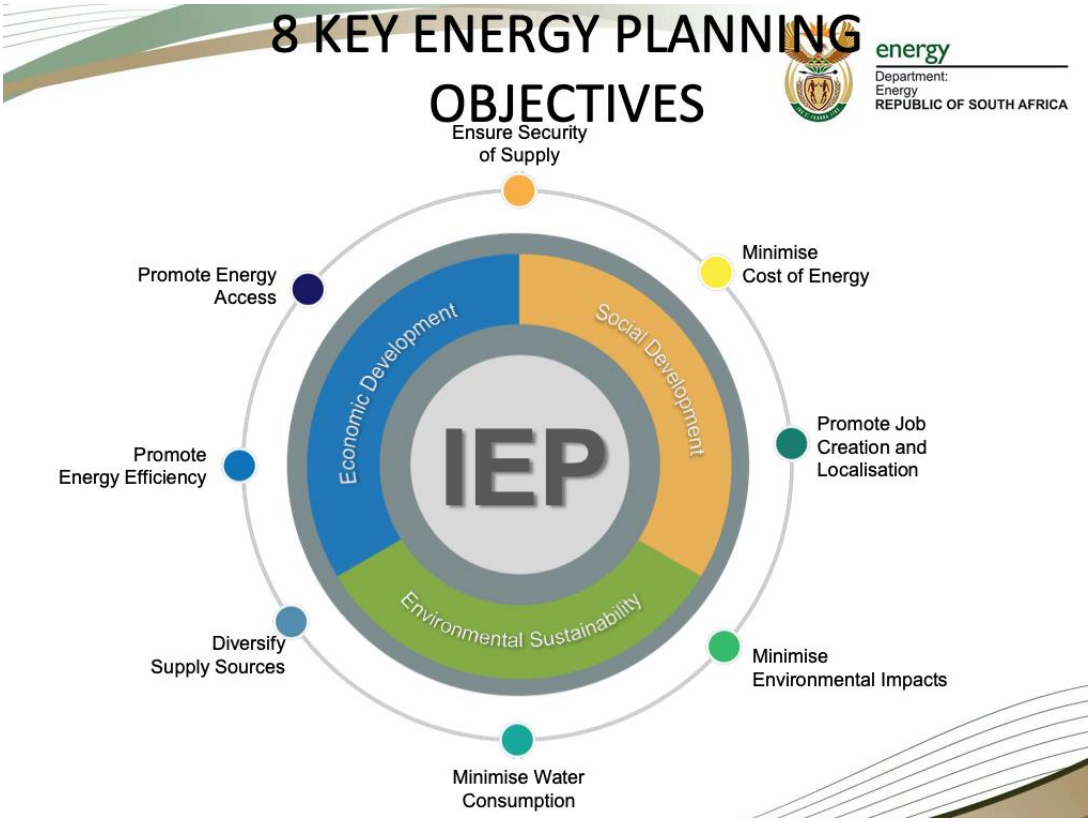

Figure 4.1: Eight key energy objectives as listed in the IEP, 2016 (extract from DOE presentation, December 2016)

The latest iteration of the IEP (25 November 2016) contained the following statement regarding solar power in South Africa:

"*South Africa experiences some of the highest levels of solar radiation in the world and this renewable resource holds great potential for the country. The daily solar radiation in South Africa varies between 4.5 and 6.5 kilowatt hours per square meter (kWh/m²) (16 and 23 mega joules per square meter [MJ/m²]) (Stassen, 1996), compared to about 3.6 kWh/m² in parts of the United States and about 2.5 kWh/m² in Europe and the United Kingdom. The total area of high radiation in South Africa amounts to approximately 194 000 km², including the Northern Cape, which is one of the best solar resource areas in the world. With electricity production per square kilometre of mirror surface in a solar thermal power station being 30.2 MW, and just 1% of the high radiation area in the country being made available for solar power generation, the generation potential is approximately 64 GW. Solar energy has the potential to contribute quite substantially to South Africa's future energy needs. This would, however, require large investments in transmission lines from the areas of high radiation to the main electricity consumer centres*."

In terms of electricity generation, the IEP states that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources, and includes the following statement regarding solar energy's contribution to the diversified energy mix:

- *Solar should play a much more significant role in the electricity generation mix than it has done historically and constitutes the greatest share of primary energy (in terms of total installed capacity) by 2050. The contribution of solar in the energy mix comprises both CSP and solar PV. Solar PV includes large scale installations for power generation which supply to the grid and individual, off-grid solar home systems and rooftop panels.*
- *Several interventions which could enhance the future solar energy landscape are recommended as follows: –Large scale CSP projects with proven thermal storage technologies and hybridisation / industrial steam application projects should be incentivised in the short to medium term. In the long term, the existing incentives could be extended to promote locally developed CSP technology storage solutions and large-scale solar fuel projects.*
- *A thorough solar resource assessment for South Africa should continue to be undertaken in the North West Province and extended to other provinces deemed to have high solar radiation levels.*
- *Investments should be made to upgrade the grid in order to accommodate increasing solar and other renewable energy contributions.*

The Integrated Resource Plan 2019 is South Africa's current gazetted energy plan. The purpose of the plan is to ensure sustainable electricity development which takes into consideration technical, economic, and social constraints, and identifies investments in the electricity sector which are required to meet the country's forecasted electricity demands at minimum costs. The consideration of GHG emissions in the determination of the energy generation mix indicates government's commitment to international obligations under the Paris Agreement.

A number of IPP Procurement Programmes have been initiated to secure electricity generated from a range of resources from the private sector (i.e. from Independent Power Producers, or IPPs). Provision has been made for new additional capacities in the IRP 2019 (refer to **Table 4.1**).

Table 4.1: Overview of the total installed capacity expected by 2030

IPP Procurement Programme	Technology	MW	Total
Renewables	Wind	17 742MW	31 320MW
	Solar CSP	600MW	
	Solar Photovoltaic	8 288MW	

	Hydro	4 600MW	
Coal	Coal	33 364MW	33 364MW
Nuclear	Nuclear	1 860MW	1 860MW
Gas & Diesel	Gas & Diesel	3 000MW	3 000MW
Other (Distributed Generation, CoGen, Biomass, Landfill)	Other (Distributed Generation, CoGen, Biomass, Landfill)	4 000MW	4 000MW

Renewable resources are valuable in contributing towards electricity generation and diversifying South Africa's electricity mix, while contributing towards South Africa's response to Climate Change. Under the REIPPPP , the DMRE intends to secure 14 725MW of electricity from renewable energy generation facilities utilising either onshore wind, concentrated solar thermal, solar photovoltaic (PV), biomass, biogas, landfill gas, or hydro across a number of bidding windows, while simultaneously contributing towards socio-economic development. A total of 1 474MW[10] of PV generated electricity has been awarded to preferred bidders across four (4) rounds of bidding to date, with 814MW still remaining to be allocated in subsequent bidding rounds. Preferred bidders identified under any IPP Procurement Programme, including the REIPPPP, are required to satisfy a number of economic development requirements, including amongst others, job creation, local content, skills development, enterprise and supplier development, and socio-economic development. In addition to electricity generation and supply, IPP Procurement Programmes also contribute positively towards socio-economic development of a region, over and above job creation.

In addition to the policy considerations detailed above, Government has prioritised post COVID-19 turnaround plans in terms of renewable energies within the Just Energy Transition (JET), coupled with key development objectives of the various spheres of government. These policies share the same ideals, such as:

» The utilisation, application and investment in renewable energy resources in South Africa is considered to be an essential means of reducing the carbon footprint of the country,
» Diversifying the national economy,
» Reducing poverty, and
» Providing critical additional energy to that provided by Eskom.

Government has compiled an Economic Reconstruction and Recovery Plan which was presented to Parliament in October 2020. According to this plan, the economic survey will rely on a massive investment in infrastructure, including energy, telecommunications, ports and rail. The core elements of the Economic Reconstruction and Recovery Plan are as follows:

1. Priority interventions for economic recovery: the plan sets out eight priority interventions that will ignite South Africa's recovery and reconstruction effort. These are the flagship initiatives that all of society will rally around to build a new economy (refer to **Figure 4.2**).
2. Enabling conditions for growth: these are growth-enhancing reforms and other preconditions for an inclusive, competitive and growing economy.
3. Macroeconomic framework: economic reconstruction and recovery requires careful mobilisation of resources to ensure fiscal sustainability.
4. Institutional arrangements: the plan focuses on execution and is supported by enhanced institutional arrangements to ensure implementation and accountability.

[10] https://www.cliffedekkerhofmeyr.com/en/news/publications/2019/Corporate/energy-alert-22-october-The-Integrated-Resource-Plan-2019-A-promising-future-roadmap-for-generation-capacity-in-South-Africa.html

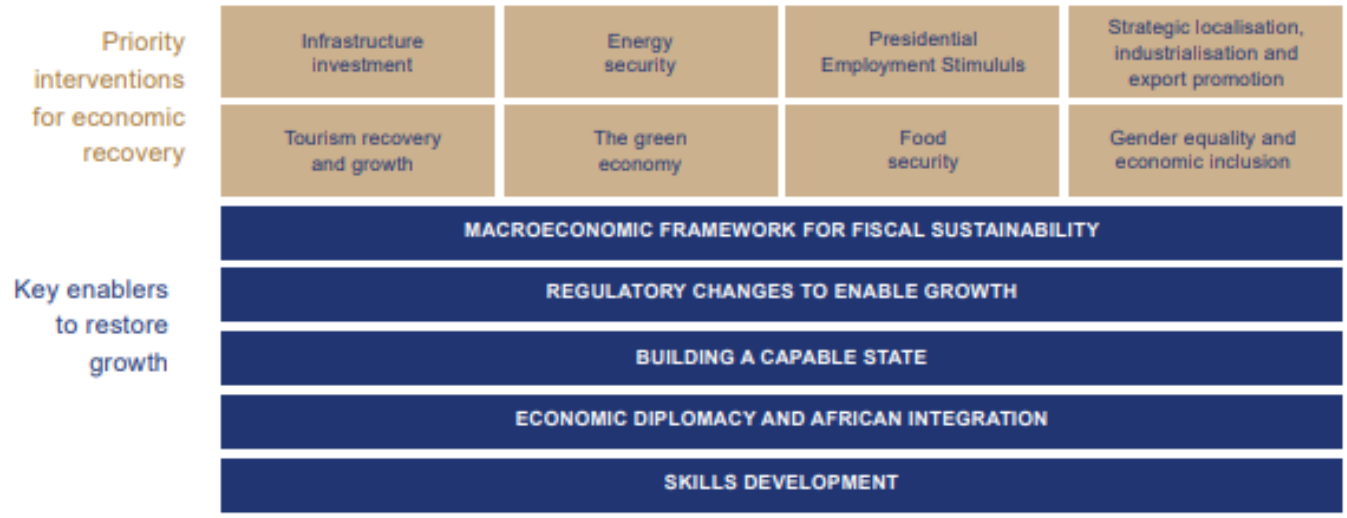

Figure 4.2: Core elements of the Economic Reconstruction and Recovery Plan (source: Building a new economy - Highlights of the Reconstruction and Recovery Plan, Presidency of the Republic of South Africa)

The plan recognises energy security as the most important prerequisite for the recovery agenda and states that renewed investment in a diversified energy mix can be achieved within a short time horizon, while alleviating a crippling energy crisis and facilitating a necessary transition to a less carbon-intensive economy. One of the key commitments of the plan is, therefore, to implement the IRP 2019 without delay to provide a substantial increase in the contribution of renewable energy sources by 2030, alongside other sources including battery storage, gas and clean coal. The transition to green energy is recognised as contributing towards the realisation of the low-carbon, climate-resilient and inclusive economy envisaged by the National Development Plan. The development of PV1 is identified as a mechanism for securing additional power generation capacity as part of the REIPPP programme or for private off-takers, reducing the reliance for electricity on Eskom.

The need for new power generation from solar PV facilities has been identified and assessed by government at a national scale considering the national energy requirements as well as international commitments under the Paris Agreement; therefore, provision has been made for the inclusion of new PV power generation capacity in South Africa's energy mix. The implementation of Dicoma PV facility has the potential to contribute positively towards the identified need, while simultaneously contributing to job creation and socio-economic development, identified as a need for the country within the National Development Plan (NDP).

Dicoma PV facility will make use of renewable energy technology and would contribute positively towards reducing South Africa's GHG emissions and ensure compliance with all applicable legislation and permitting requirements. In addition, by making use of PV technology, Dicoma PV facility would have reduced water requirements when compared with some other generation technologies in alignment with one of the vision 2030 themes of the then-Department of Water and Sanitation's (now the Department of Human Settlements, Water and Sanitation) National Water Resource Strategy 2 (2013) (i.e. transitioning to a low carbon economy through stimulating renewable energy and retrofitting buildings).

4.4 Need and Desirability of the project from a Regional Perspective

South Africa's electricity generation mix has historically been dominated by coal. However, up to 2030 a new capacity demand will be driven by the decommissioning of existing coal-fired power stations. A further 24 100MW (**Figure 4.3**) of coal power is expected to be decommissioned in the period 2030 to 2050. Therefore, additional capacity will be required from renewable energy sources, particularly solar with 6 000MW being allocated for the period up to 2030.

	Coal	Coal (Decommis-sioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37,149		1 860	2,100	2 912	1 474	1 980	300	3 830	499
2019	2,155	-2,373					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1,433	-557				114	300			
2021	1,433	-1403				300	818			
2022	711	-844			513	400 1,000	1,600			
2023	750	-555				1000	1,600			500
2024			1,860				1,600		1000	500
2025						1000	1,600			500
2026		-1,219					1,600			500
2027	750	-847					1,600		2000	500
2028		-475				1000	1,600			500
2029		-1,694			1575	1000	1,600			500
2030		-1,050		2,500		1000	1,600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33,364		1,860	4,600	5,000	8,288	17,742	600	6,380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity
Committed/Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

- 2030 Coal Installed Capacity is less capacity decommissioned between years 2020 and 2030.
- Koeberg power station rated/installed capacity will revert to 1,926MW (original design capacity) following design life extension work.
- Other/ Distributed generation includes all generation facilities in circumstances in which the facility is operated solely to supply electricity to an end-use customer within the same property with the facility.
- Short term capacity gap is estimated at 2,000MW.

Figure 4.3: A snapshot of the updated Energy Mix as per the IRP 2019

Although the majority of South Africa's electricity generation infrastructure (coal-fired power stations) is currently located within Mpumalanga due to the location of coal resources within this province, the North West Province has been identified as an area where electricity generation from solar energy facilities is highly feasible and a viable option. The location of the study area and project site within the North West is therefore considered to support the Province/Region's generation targets. The Lichtenburg area is also considered as a hub for the development of solar energy projects due to the viability of the solar resource for the area and the number of projects proposed in the area.

The overarching objective for the solar energy facility is to maximise electricity production through exposure to the solar resource, while minimising infrastructure, operational and maintenance costs, as well as social and environmental impacts. From a regional site selection perspective, this region is considered to be preferred for solar energy development by virtue of its annual solar irradiation values. The GHI for the area derived from the World Bank Group's Global Solar Atlas is approximately 2 143 kWh/m^2/annum, equivalent to the highest GHI values in the country (refer to **Figure 4.4**).

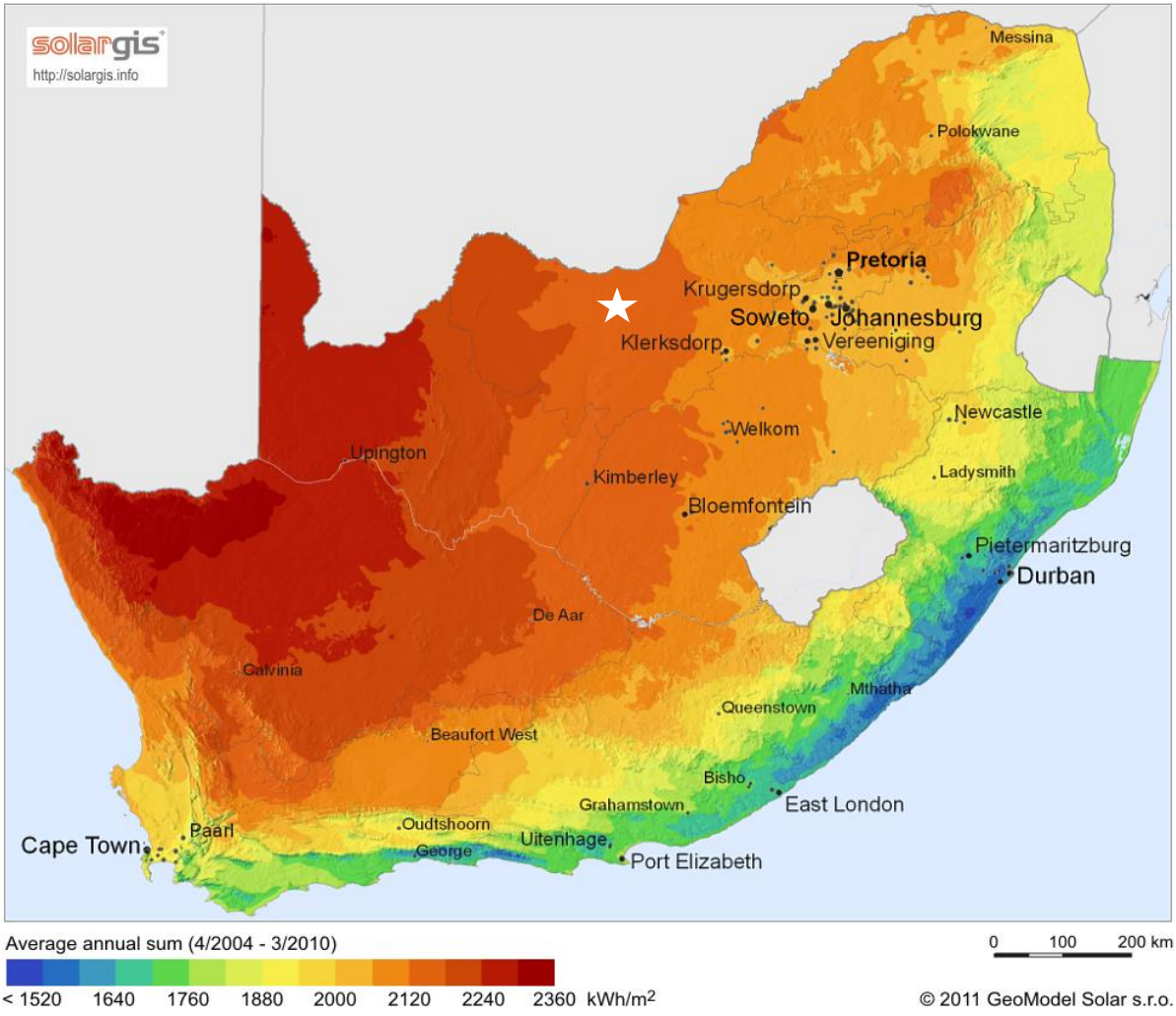

Figure 4.4: Solar irradiation map for South Africa, with the position of Dicoma PV shown by the white star (Source: GeoModel Solar)

4.5 Receptiveness of the proposed development area for the establishment of Dicoma PV

The placement of a solar PV facility is strongly dependent on several factors including climatic conditions (solar irradiation levels), topography, the location of the site, and in particular the location in a node for renewable projects, availability of grid connection, the extent of the site and the need and desirability for the project. From a local level perspective, the project site and development area have specifically been identified by the proponent as being highly desirable from a technical perspective for the development of a solar PV facility due to the following site characteristics:

» **Solar resource**: The economic viability of a solar PV facility is directly dependent on the annual direct solar irradiation values. The Global Horizontal Irradiation (GHI) for this geographic location is in the region of approximately 2 143 kWh/m^2/annum, which is considered favourable for the development of a solar PV facility.

» **Topography**: Sites that facilitate easy construction conditions, (i.e. relatively flat topography, lack of major rock outcrops, limited watercourse crossings, etc.) are favoured by developers during the site

selection process. As a result, the development area for Dicoma PV consists of a flat gently undulating topography, with slopes of less than 5% over most of the area, and with an average elevation of ~1500m above sea level. There are no prominent hills within the project site. These characteristics are preferred for the development of a solar PV facility as construction efforts and costs are minimised, and therefore the study area is considered to be preferable and acceptable for the development of Dicoma PV.

» **Site extent and land availability:** Availability of relatively level land of sufficient extent can be a restraining factor to PV development, as a 75MW solar PV development and associated infrastructure requires sufficient land space. The development area, within which the project development footprint will be located, is ~ 176ha. This area is considered to be sufficient for the planned 75MW PV facility and provides an opportunity for the avoidance of sensitive environmental features and areas.

» **Access to Road Infrastructure and Site access**: The area in which the project site is located can be readily accessed via the R505 Regional Road. Within the facility development area itself, access will be required from new / existing roads for construction purposes (and limited access for maintenance during operation). The final layout will be determined following the identification of site related sensitivities. The final layout will be determined following the identification of site related sensitivities. The proximity of the development area to the R505 road 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 development area during the construction phase, accessibility to the project site is a key factor in determining the viability of Dicoma PV facility, particularly taking transportation costs (direct and indirect) into consideration and the impact of this on the project economics and the ability to submit a competitive bid under the DMRE's REIPPP Programme.

» **Grid access:** A key factor in the siting of any solar PV facility is that the project must have a viable grid connection in order to evacuate the generated electricity to the national grid. The grid connection point for Dicoma PV will be via a loop-in and loop out (LILO) overhead power line between the planned Eskom switching station and the existing Delareyville Munic– Watershed 1 88kV power line[11].to the south of the site. Having a grid connection point in close proximity to the project site (< 15km) reduces the necessary grid infrastructure and therefore addresses Eskom's concerns for lower cost connection alternatives. A shorter grid solution will also ensure that potential environmental impacts are kept to a minimum.

» **Land suitability and land use activities:** The current land use of the development area is an important consideration in site selection in terms of limiting disruption to existing land use practices. The project site is currently used for grazing, which is generally preferred for developments of this nature as the grazing activities can continue on the project site in tandem with the operation of the solar PV facility. There is no cultivated agricultural land in the project site or directly adjacent to it which could be impacted upon by the proposed development. The proposed development is compatible with the surrounding land uses and does not present a conflicting land use.

» **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

[11] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, and Dudfield-Watershed 1 88kV, and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

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 consent for the project to proceed on the property through the signing of a land option to lease agreement with the proponent.

Taking into consideration the solar resource, grid access, land suitability, landowner support, access to road infrastructure, the current land use of the project site and development area, in conjunction with other large-scale solar PV projects that have been authorised within the vicinity of the project site, the development of Dicoma PV is therefore considered to be desirable and will ultimately contribute to, and further develop the successful power generation activities already being undertaken within the area.

Therefore, the development of Dicoma PV within the project site and development area is considered to be desirable considering the characteristics of the area.

4.6 Benefits of Renewable Energy and the Need and Desirability

The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa; these include:

Socio-economic upliftment of local communities: Dicoma PV has the potential to create much needed employment for unskilled locals during the construction phase. Training opportunities will also be afforded to qualified local people who can be upskilled to undertake certain roles during the construction and operation phases. In terms of the needs of the local community, the Local and District municipality IDPs identified the need to facilitate economic development by creating an environment that is conducive for business development, economic growth, sustainable employment opportunities and growth in personal income levels of communities; unlock opportunities to increase participation amongst all sectors of society in the mainstream economy to create decent job opportunities; promote Local Economic Development; and enhance rural development and agriculture. A study undertaken by the Department of Mineral Resource and Energy (DMRE), National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of the projects implemented to date had created 40% more jobs for South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.

Dicoma PV also has the potential to make a positive contribution towards the identified community needs. In terms of the economic development requirements of the REIPPPP, the project will commit benefits to the local community in the form of job creation, localisation, and community ownership. In accordance with the DMRE's bidding requirements of the REIPPP, a percentage of the revenue generated per annum during operation will be made available to local communities through a social beneficiation scheme. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for local communities is significant. Secondary social benefits can be expected in terms of additional spend in nearby towns due to the increased demand for goods and services. These socio-economic benefits would include an increase in the standard of living for local residents within the area as well as overall financial and economic upliftment.

Increased energy security: Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses. As a result of the power constraints in the first half of 2015, power generators meant to be the "barely-ever-used" safety net for the system (diesel-fired gas turbines) were running at >30% average load factor in the first half of 2015. Load shedding occurred during 82 days in the first half of 2015 (out of 181 days). Results of a CSIR Energy Centre study for the period January to June 2015 (CSIR, August 2015), concluded that the already implemented renewable projects (wind and solar) within the country avoided 203 hours of so-called 'unserved energy'. During these hours the supply situation was such that some customers' energy supply would have had to be curtailed ('unserved') had it not been for the renewables. The avoidance of unserved energy cumulated into the effect that for 15 days, from January to June 2015, load shedding was avoided entirely, delayed, or a higher stage of load shedding prevented due to the contribution of renewable wind and PV projects[12]. More recently, power generated from renewable energy sources have assisted Eskom in alleviating the need for rolling blackouts when aging power stations have been offline for maintenance.

Resource saving: It is estimated that the achievement of the targets in the Renewable Energy White Paper will result in water savings of approximately 16.5 million kilolitres per annum. As an already water-stressed nation, it is critical that South Africa engages in a variety of water conservation measures, particularly due to the detrimental effects of climate change on water availability. Renewable energy also translates into revenue savings, as fuel for renewable energy facilities is free, while compared to the continual purchase of fuel for conventional power stations. Results of a CSIR Energy Centre study for January – June 2015 (CSIR, August 2015) have quantified the contribution from renewable energy to the national power system and the economy over the first 6 months of 2015 compared to the 12 months of 2014:

2015 (6 months)	2014 (12 months)
R3.60 billion saving in diesel and coal fuel costs	R3.64 billion saving in diesel and coal fuel costs
200 hours of unserved energy avoided, saving at least an additional R1.20 billion–R4.60 billion for the economy	120 hours of unserved energy avoided, saving at least an additional R1.67 billion for the economy
Generated R4.0 billion more financial benefits than cost	Generated R0.8 billion more financial benefits than cost

Exploitation of significant renewable energy resource: At present, valuable renewable resources including biomass by-products, solar irradiation and wind power remain largely unexploited. The use of these energy flows will strengthen energy security through the development of a diverse energy portfolio in South Africa.

Economics: As a result of the available renewable energy resources and the competitive renewable energy procurement process, both wind power and solar PV power have now been proven as cheaper forms of energy generation in South Africa than fossil fuel (coal) generated power. The IRP 2019 gazetted by the Minister of Mineral Resources and Energy in October 2019, updates the energy forecast for South Africa from the current period until the year 2030 and has made an allocation of 6000MW in addition to the already installed/committed capacity of 2 288MW from solar PV facilities which will be developed from 2022 – 2030.

Pollution reduction: The release of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation. The use

[12] (http://ntww1.csir.co.za/plsql/ptl0002/PTL0002_PGE157_MEDIA_REL?MEDIA_RELEASE_NO=7526896)

of solar irradiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation.

Climate friendly development: The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. South Africa is estimated to currently be responsible for approximately 1% of global GHG emissions (and circa half of those for which Africa is responsible) and is currently ranked 9th worldwide in terms of per capita carbon dioxide emissions. Since its inception, the REIPPPP has achieved carbon emission reductions[13] of 25.3 million tonnes of CO_2 (IPP Office, March 2018). The development of Dicoma PV, and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO_2 emissions.

Support for international agreements: The effective deployment of renewable energy provides a tangible means for South Africa to demonstrate its commitment to its international agreements under and for cementing its status as a leading player within the international community.

Employment creation: The development, procurement, installation, maintenance and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. In the short 8-year period, the REIPPPP has attracted R209.4 billion in committed private sector investment, resulting in 38 701 jobs for the youth and women from surrounding communities[14].

Acceptability to society: Renewable energy offers a number of tangible benefits to society including reduced pollution concerns, improved human and ecosystem health and climate friendly development.

Support to a new industry sector: The development of renewable energy offers the opportunity to establish a new industry within the South African economy, which will create jobs and skill local communities which have potential for further renewable energy projects.

Protecting the natural foundations of life for future generations: Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development. The development of renewable energy facilities contributes to the protection of the foundations.

4.7 Alternatives Considered during the EIA Process

In accordance with the requirements of Appendix 2 of the 2014 Environmental Impact Assessment (EIA) Regulations (GNR 326), reasonable and feasible alternatives including but not limited to site and technology alternatives, as well as the "do-nothing" alternative should be considered. Several other solar renewable energy facilities are planned within the broader study area, supporting the suitability of the area for solar PV projects.

[13] Carbon emission reduction is calculated based on a displacement of power, from largely coal-based to more environmentally friendly electrical energy generation, using a gross Eskom equivalent emissions factor of 1.015 tons CO_2/MWh.

[14] https://www.sanews.gov.za/south-africa/renewable-energy-programme-attracts-r2094-billion-sa-economy

The DFFE Guideline for determining alternatives states that the key criteria for consideration when identifying alternatives are that they should be "practicable", "feasible", "relevant", "reasonable" and "viable". Essentially there are two types of alternatives:

» Incrementally different (modifications) alternatives to the project.
» Fundamentally (totally) different alternatives to the project.

In this instance, 'the project' refers to Dicoma PV, a solar PV facility with capacity of up to 75MW$_{AC}$ and associated infrastructure proposed to be developed by an Independent Power Producer (IPP) and intended to form part of the DMRE's REIPPP Programme.

4.7.1 Consideration of Fundamentally Different Alternatives

Fundamentally different alternatives are usually assessed at a strategic level and, as a result, project specific EIAs are therefore limited in scope and ability to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the DMRE's current Integrated Resource Plan for Electricity 2010 – 2030 (IRP)[15], and will continue to be addressed as part of future revisions. In this regard, the need for renewable energy power generation from solar PV facilities has been identified as part of the technology mix for power generation in the country for the next 20 years. Therefore, fundamentally different alternatives to the proposed project are not considered within this EIA process.

4.7.2 Consideration of Incrementally Different Alternatives

Incrementally different alternatives relate specifically to the project under investigation. "Alternatives", in relation to a proposed activity, means different ways of meeting the general purposes and requirements of the activity, which may include alternatives for:

» The property on which, or location where the activity is proposed to be undertaken.
» The type of activity to be undertaken.
» The design or layout of the activity.
» The technology to be used in the activity.
» The operational aspects of the activity.

In addition, the option of not implementing the activity (i.e. the "do-nothing" alternative) must also be considered.

These alternatives are discussed under the respective sub-headings below and where no alternatives are applicable, a motivation has been included.

i. <u>Property or Location Alternatives</u>

The placement of a solar PV facility is dependent on several other factors including land suitability, climatic conditions (solar irradiation levels), topography, the location and extent of the study area, availability of grid connection infrastructure and the need and desirability of the project. Dicoma PV (Pty) Ltd as the Applicant,

[15] The Integrated Resource Plan (IRP) is legislated policy which regulates power generation planning.

considers the preferred development area placed within the study area as being highly favourable and suitable for the establishment of a solar PV facility.

Based on above site-specific attributes discussed in Section 4.5, the proponent considers the development area located within the study area as highly preferred in terms of the development of a solar PV facility and expects that Dicoma PV facility will be able to draw on synergies with the projects proposed and/or currently authorised within the vicinity of the study area. As a result, no property/location alternatives are proposed as part of this EIA process.

ii. Design and Layout Alternatives

The affected properties (i.e. Portion 1 of the Farm Houthaalboomen 31, Portion 9 of the Farm Houthaalboomen 31 and Portion 10 of the Farm Houthaalboomen 31) in which development area (~176ha) is located is for the installation of a solar PV facility, while allowing for the avoidance of environmental site sensitivities. Findings from specialist field surveys were considered through this Scoping process in order to provide site specific information regarding the development area considered for the Dicoma PV facility.

Areas to be avoided that will be identified during the scoping phase, specifically relating to ecological and sensitivities present within the project site will be utilised as a tool by the developer to identify and locate the development area of the PV facility with a contracted capacity of 75W within the development area of 176ha. This will be undertaken with the aim of avoiding possible sensitive areas within the project site so as to limit impacts associated with the development which would result in unacceptable loss.

The site extent is sufficient for the proposed development and therefore reduces the need to consider alternative locations for the PV facility and the associated infrastructure. Potential environmentally sensitive areas have been identified as part of the Scoping Phase (refer to Chapter 8) for further detailed consideration (through site-specific specialist studies) during the EIA Phase. The environmental sensitivity identification process will inform the layout design for the PV facility, avoiding sensitive areas as far as possible, and thereby ensuring that the layout plan taken forward for consideration during the EIA Phase is the most optimal from an environmental perspective.

» *Grid Connection Alternatives*

Two alternative grid connection corridors will be considered for the establishment of the Dicoma PV Facility:

Grid Connection Alternative 1: 33kV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other approximately 1.3km east of the eastern boundary of the Dicoma PV facility development area, on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the Delareyville Munic–Watershed 1 88kV power line[16]. . The grid connection infrastructure is located within an assessment corridor 100m in width.

[16] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, and Dudfield-Watershed 1 88kV, and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

Grid Connection Alternative 2: 33kV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other and infringes on the eastern boundary of the Dicoma PV facility development area on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the Delareyville Munic–Watershed 1 88kV power line[17]. The grid connection infrastructure is located within an assessment corridor of 100m wide in width.

Both alternatives will be considered and assessed during the EIA phase in order to determine the most optimal grid connection option from an environmental perspective.

4.7.3 Technology Alternatives

The Lichtenburg area has been identified for the development of solar and wind energy renewable facilities. Few technology options are available for solar facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail in the area, so that optimality is obtained by the final site selection. Solar energy is considered to be the most suitable renewable energy technology for this area, based on the site location, ambient conditions and energy resource availability.

Solar PV was determined as the most suitable option for further assessment. The IRP (2019), excludes the procurement of power from CSP facilities until 2030, whereas new additional capacity of approximately 6 000MW will be required from solar PV facilities. Therefore, PV technology was identified as being the preferred option for the study area and consists of a lower visual profile and limited water requirements when compared to the CSP technology alternative. Given the allocations in the IRP (2019), solar PV is considered as the most appropriate technology option. Furthermore, the development of Dicoma PV facility provides an opportunity to optimally use a site that was previously earmarked for energy generation through making use of solar PV technology (with projects previously authorised on this footprint).

Therefore, considering the above, no other technology alternatives are being assessed for the development of Dicoma PV facility. When considering PV as a technology choice, several types of panels are available, including *inter alia*:

- Bifacial PV panels
- Monofacial PV panels
- Fixed mounted PV systems (static / fixed-tilt panels).
- Single-axis tracking or double-axis tracking systems (with solar panels that rotate around a defined axis to follow the sun's movement).

The primary difference between PV technologies available relate to the extent of the facility, as well as the height of the facility (visual impacts), however the potential for environmental impacts remain similar in magnitude. Fixed mounted PV systems are able to occupy a smaller extent and have a lower height when compared to tracking PV systems, which require both a larger extent of land, and are taller in height. However, both options are considered to be acceptable for implementation from an environmental perspective. Bifacial solar PV panels offer many advantages over monofacial PV panels, as power can be

[17] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, and Dudfield-Watershed 1 88kV, and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

produced on both sides of the module, increasing total energy generation. The preference will therefore be determined on the basis of technical considerations and the site conditions.

The PV panels are designed to operate continuously for more than 20 years, mostly unattended and with low maintenance. The impacts associated with the construction, operation, and decommissioning of the facility are anticipated to be the same irrespective of the PV panel selected for implementation.

4.7.4 The 'Do-Nothing' Alternative

The 'Do-Nothing' alternative is the option of not constructing Dicoma PV facility. Should this alternative be selected, there would be no environmental impacts or benefits as a result of construction and operation activities associated with a solar PV facility. The 'do-nothing' alternative will therefore likely result in minimising the cumulative impact on the land, although it is expected that pressure to develop the site for renewable energy purposes will be actively pursued due to the same factors which make the site a viable option for renewable energy development. This alternative will be assessed within the EIA Phase of the process.

CHAPTER 5: APPROACH TO UNDERTAKING SCOPING PHASE

In terms of the EIA Regulations of December 2014 (as amended) published in terms of the NEMA (Act No. 107 of 1998) as amended, the construction and operation of Dicoma PV is a listed activity requiring Environmental Authorisation (EA). The application for EA is required to be supported by an Environmental Impact Assessment (EIA) process based on the contracted capacity of the facility being 75MW and Activity 1 of Listing Notice 2 (GNR 325).

An EIA process refers to the process undertaken in accordance with the requirements of the relevant EIA Regulations (the 2014 EIA Regulations (GNR 326), as amended), which involves the identification and assessment of direct, indirect, and cumulative environmental impacts associated with a proposed project or activity. The EIA process comprises two main phases: i.e. **Scoping** and **EIA Phase**.

South Africa is subject to the enforcement of Government Gazette 43096 which places the country in a national state of disaster limiting the movement of people to curb the spread of the COVID-19 virus. Considering the limitations in place, a comprehensive consultation process was designed and implemented to cater for the undertaking of a full-scale, innovative public participation process which included I&APs, the competent authority, directly impacted landowners/occupiers, adjacent landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders, while remaining within the limits as stipulated by the National Government. This chapter outlines the process that was followed during the Scoping Phase of the EIA process.

The EIA process is illustrated in **Figure 5.1**.

Figure 5.1: The Phases of an Environmental Impact Assessment (EIA) Process

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for and (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	All listed activities triggered and applied for are included in **Section 5.2**.
(g)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The public participation process followed throughout the EIA process of Dicoma PV is included in **Section 5.5.2** and copies of the supporting documents and inputs are included in **Appendix C**.
(g)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	The main issues raised through the undertaking of the public participation process including consultation with I&APs are included in the Comments and Responses Report in **Appendix C**.
(g)(vi) 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;	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 are included in **Section 5.5.3**.

5.2 Relevant legislative permitting requirements

The legislative permitting requirements applicable to Dicoma PV facility, as identified at this stage in the process and considered within this EIA process, are described in more detail under the respective sub-headings. Relevant permitting requirements are detailed within **Table 5.5**.

5.2.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA (No. 107 of 1998) is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant Environmental Authorisation (EA). Due to the fact that Dicoma PV facility is a power generation project and therefore may relate to the IRP for Electricity 2010 – 2030, the National Department of Forestry, Fisheries and the Environment (DFFE) has been determined as the Competent Authority (CA) in terms of GNR 779 of 01 July 2016. The Provincial authority, the North West Department of Economic Development, Environment, Conservation and Tourism (DEDECT) is a Commenting Authority on the project.

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that developers are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the Competent Authority with sufficient information in order for an informed decision to be taken regarding the Application for EA.

The EIA process being conducted for the Dicoma PV facility is undertaken in accordance with Section 24(5) of the NEMA, which defines the procedure to be followed in applying for EA, and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental effect on the environment, and which may not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

Table 5.1 contains all the listed activities identified in terms of NEMA, the 2014 EIA Regulations (GNR 326), and Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325), and Listing Notice 3 (GNR 324) which may be triggered by the proposed development of the Dicoma PV facility and associated infrastructure, and for which an application for EA has been made:

Table 5.1: Listed activities identified in terms of the Listing Notices (GNR 327, 325 and 324)

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	11 (i)	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 275kV or more. ***33kV MV cabling, 132kV facility substation, 132kV Eskom switching station, and Loop-in-Loop out 132kV power line are proposed to connect Dicoma PV to the Eskom electricity grid. The site falls outside an urban area.***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	14	The development and related operation of facilities and infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. ***The development of Dicoma PV facility will require the construction and operation of facilities and infrastructure for the storage and handling of dangerous goods (combustible and flammable liquids, such as oils, lubricants, solvents) associated with the on-site substations where such storage will occur inside containers with a combined capacity exceeding 80 cubic meters but not exceeding 500 cubic meters***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	24 (ii)	The development of a road – (ii) with a reserve wider than 13.5m, or where no reserve exists where the road is wider than 8m. ***Access roads will be developed during the construction phase of the projects. These are likely to exceed 8m in width.***
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	28 (ii)	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 1ha. ***The total area to be developed for the PV facility and associated infrastructure is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture.***

Notice Number	Activity Number	Description of listed activity
Listing Notice 1 (GNR 327) 08 December 2014 (as amended)	56 (ii)	The widening of a road by more than 6 m, or lengthening of a road by more than 1 km – (ii) where no reserve exists, where the existing road is wider than 8 metres ***Existing roads may require widening of up to 6m and/or lengthening by more than 1km, to accommodate the movement of heavy vehicles and cable trenching activities.***
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20MW or more. ***The proposed PV facility will have a capacity that exceeds 20MW. The Dicoma PV facility will have a contracted capacity of 75MW.***
Listing Notice 2 (GNR 325) 08 December 2014 (as amended)	15	The clearance of an area of 20ha or more of indigenous vegetation[18]. ***Dicoma PV will require the clearance of an area in excess of 20ha for the development of the PV facility and associated infrastructure.***
Notice Number	**Activity Number**	**Description of listed activity**
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	**4 (iv)**	The development of a road wider than 4 metres with a reserve less than 13,5 metres. **h. North West** (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; ***The development of the PV facility and associated infrastructures will require the development of roads wider than 4m within ESA areas.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	**10 (iv)**	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres **h. North West** (iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; ***The development of the PV facility and associated infrastructures will require the storage and handling of a dangerous good with a capacity of 80 cubic meters within ESA areas.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	**12 (iv)**	The clearance of an area of 300 square metres or more of indigenous vegetation **h. North West**

[18] "Indigenous vegetation" as defined by the 2014 EIA Regulations (GNR 326) refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

Notice Number	Activity Number	Description of listed activity
		iv. Within critical biodiversity areas identified in systematic biodiversity plan adopted by the competent authority ***The development of the renewable energy facility and associated infrastructures will require the clearance of more than 300 square meters of indigenous vegetation within areas classified as ESA.***
Listing Notice 3 (GNR 324) 08 December 2014 (as amended)	**18 (v)**	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. **h. North West** (v) Within critical biodiversity areas identified in systematic biodiversity plan adopted by the competent authority ***The development of the renewable energy facilities and associated infrastructures may require the widening of a road by more than 4metres, outside urban areas and within areas classified as ESA.***

5.2.2 National Water Act (No. 36 of 1998) (NWA)

In accordance with the provisions of the National Water Act (No. 36 of 1998) (NWA), all water uses must be authorised with the Competent Authority (i.e. the Regional Department of Human Settlements, Water and Sanitation (DHSWS) or the relevant Catchment Management Agency (CMA)). Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation.

In terms of the NFEPA (2011) and the NBAs 2018 National Wetlands Map 5 no wetlands or watercourse features are located within the project site as well as within the 500m regulated area of a wetland. It has been concluded that no surface freshwater resource features will be impacted by the Dicoma PV facility development and as such further assessments relating freshwater resource features (during the EIA phase) will not be necessary.

5.2.3 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources, and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

<u>Section 38: Heritage Resources Management</u>

1). Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

- *a. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- *b. the construction of a bridge or similar structure exceeding 50m in length;*
- *c. any development or other activity which will change the character of a site –*

i). exceeding 5 000m² in extent; or
ii). involving three or more existing erven or subdivisions thereof; or
iii). involving three or more erven or divisions thereof which have been consolidated within the past five years; or
iv). the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed development, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the South African Heritage Resources Agency (SAHRA) Permit Regulations (GNR 668).

5.3 Overview of the Scoping and EIA (S&EIA) Process being undertaken for Dicoma PV

In terms of NEMA, the 2014 EIA Regulations (GNR 326), and Listing Notices (Listing Notice 1 (GNR 327), Listing Notice 2 (GNR 325) and Listing Notice 3 (GNR 324) the development of Dicoma PV facility requires EA from DFFE subject to the completion of a full Scoping and Environmental Impact Assessment (S&EIA), as prescribed in Regulations 21 to 24 of the 2014 EIA Regulations (GNR 326). The need for a full S&EIA process to be conducted in support of the application for EA is based on listed activities triggered which are contained within Listing Notice 2 (GNR 325).

The S&EIA process is to be undertaken in two phases as follows:

» The **Scoping Phase** includes the identification and description of potential issues associated with the project through desktop studies, field surveys, as well as consultation with I&APs and key stakeholders through a Public Participation process. The entire development area and development area are considered within this process. Through this study, areas of sensitivity within the broader site are identified and delineated in order to identify any environmental fatal flaws, and environmentally sensitive, or no-go areas which need to be considered. In accordance with Regulation 21(1) of the 2014 EIA Regulations (GNR 326) this Scoping Report prepared for the project will be subject to a 30-day review and comment period during which any Interested and Affected Party (I&AP) or Authority are invited to review and provide comment on the findings (refer to **Figure 5.2**). Following the completion of this review period, a Final Scoping Report which incorporates all comments received during the 30-day public review and comment period, will be prepared and submitted to DFFE for its consideration. Following its receipt of the Final Scoping Report DFFE has 43 days within which to either accept the Scoping Report, and advise the applicant to proceed or continue with the tasks contemplated in the Plan of Study for EIA, or refuse the Application for EA in the event that the proposed activity is in conflict with a prohibition contained in legislation, or the Scoping Report does not substantially comply with Appendix 2 of the 2014 EIA Regulations (GNR 326).
» The **EIA Phase** involves a detailed assessment of potentially significant positive and negative direct, indirect, and cumulative impacts identified during the Scoping Phase. This phase includes detailed

specialist investigations and a Public Participation process, and results in the compilation of an EIA Report and Environmental Management Programme (EMPr). In accordance with Regulation 23(1)(a) of the 2014 EIA Regulations (GNR 326) the EIA Report and EMPr prepared for the project will also be subject to a 30-day public review and comment period during which members of the public, I&APs, and authorities will be invited to review and provide comment on the EIA Report and EMPr. Following the conclusion of this review period a Final EIA Report and EMPr which incorporates all comments received during the 30-day review and comments period, will be prepared and submitted to DFFE for its consideration. Following its receipt of the Final EIA Report and EMPr, DFFE has 107 days within which to either grant or refuse the EA.

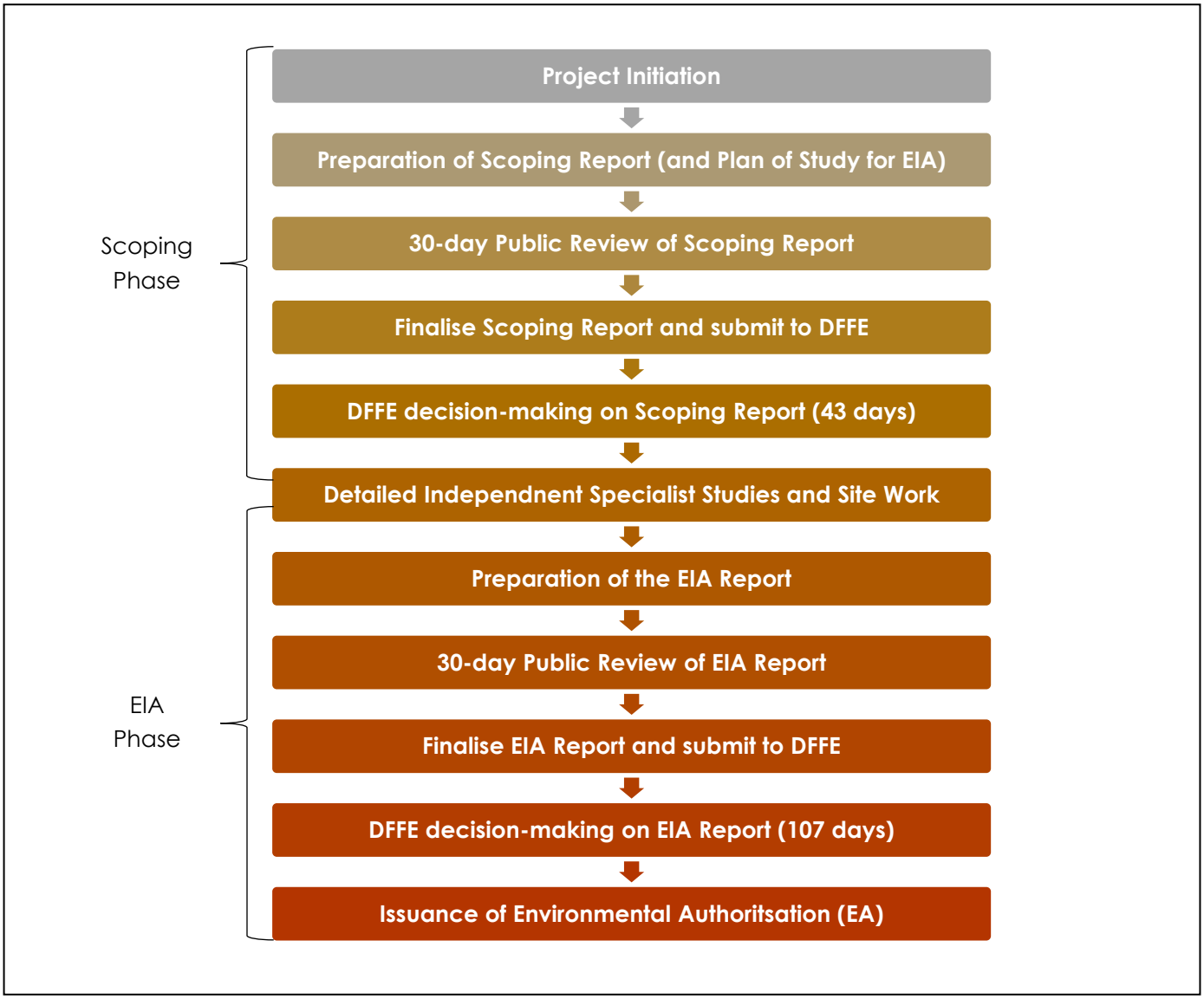

Figure 5.2: Regulated timeframe of an Environmental Impact Assessment (EIA) Process

5.4 Objectives of the Scoping Phase

This Scoping Report documents the evaluation of potential environmental impacts of the Dicoma PV facility and forms part of the EIA process being conducted in support of an Application for EA for the project. The Scoping Phase has been conducted in accordance with the requirements of the 2014 EIA Regulations (GNR 326), and therefore aims to:

- » Identify and evaluate potential environmental (biophysical and social) impacts and benefits of all phases of the proposed development (including design, construction, operation and decommissioning) within the broader project site and development area through a review of existing baseline data, including specialist studies which were undertaken within the project area.
- » Identify potentially sensitive environmental features and areas within the broader project site and development area in order to inform the preliminary design process of the facility.
- » Define the scope of studies to be undertaken during the EIA process.
- » Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA Phase, as well as regarding the scope and extent of specialist studies that will be required to be undertaken.

The following objectives of the Scoping Phase (in accordance with Appendix 2 of the 2014 EIA Regulations (GNR 326)) have been met, through the undertaking of a consultative process.

- » The identification of relevant policies and legislation regarding the activities to be undertaken have been identified and considered within this Scoping Report.
- » Activities to be undertaken for the development of Dicoma PV have been identified and motivated in terms of the need and desirability for the activities to take place.
- » Potential impacts associated with the undertaking of the identified activities and technology have been identified and described.
- » Identification of areas of high sensitivity to be avoided by the development area.
- » Key issues associated with the project to be addressed during the EIA Phase for further detailed study and ground-truthing have been identified and listed within this Scoping Report.
- » The level of assessment, expertise and the extent of further consultation to be undertaken in the EIA Phase of the process, with the aim of determining the extent of impacts associated with the activities through the life cycle of the project (i.e. construction, operation and decommissioning), have been identified and included within this Scoping Report.

5.5 Overview of the Scoping Phase

Key tasks undertaken within the Scoping Phase include:

- » Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
- » Submission of the completed Application for EA to the competent authority (DFFE) in terms of Regulations 5 and 16 of the 2014 EIA Regulations (GNR 326).
- » Undertaking a public participation process (in line with the approved public participation plan submitted to DFFE) in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017) Public Participation guidelines in order to identify issues and concerns associated with the proposed project.
- » Preparation of a Scoping Report and Plan of Study for EIA in accordance with the requirements of Appendix 2 of the 2014 EIA Regulations (GNR 326).
- » Preparation of a Comments and Response (C&R) Report detailing all comments raised by I&APs and responses provided as part of the Scoping Phase.
- » Submission of a Final Scoping Report, including a Plan of Study for the EIA, to DFFE for review and approval.

5.5.1 Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

In terms of GNR 779 of 1 July 2016, the National DFFE has been determined as the competent authority for all projects which relate to the IRP and any updates thereto. As the project is proposed within North West Province, the North West DEDECT is the provincial commenting authority for the project. Consultation with these authorities is being undertaken throughout the Scoping Phase. To date, this consultation has included the following:

- Submission of a Pre-Application Meeting request with DFFE on 23 September 2021 and the proposed Public Participation Plan. Following submission of the PP Plan, the DFFE provided approval of the submitted PP Plan via email on 29 September 2021, and no pre-application meeting was considered necessary.
- Submission of the Application for Environmental Authorisation to the DFFE via the use of the DFFE Novell Filr System.
- Submission of the Scoping Report for review and comment by:
  - The competent and commenting authorities.
  - State departments that administer laws relating to a matter affecting the environment relevant to an Application for EA.
  - Organs of State which have jurisdiction in respect of the activity to which the application relates.

The submissions, as listed above, are all undertaken electronically, as required by the DFFE (in line with the directions for new Applications for Environmental Authorisations provided for in GNR650 of 05 June 2020). A record of all authority correspondence undertaken during the Scoping Phase is included in **Appendix B** and **Appendix C**.

5.5.2 Public Participation Process

Public participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GN R326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GN R326) (as amended) and is being followed for this proposed project.

The Public Participation Process for Dicoma PV has been run in tandem with the public consultation for Barleria PV and Setaria PV, located in close proximity to the site. The benefit to the stakeholder is that all information relevant to all related applications has been made available for review together, and not only for comments to be raised across the three applications at one time, but also provided a complete picture of the potential for impacts and/or benefits related to the suite of projects located in close proximity to one another.

The Public Participation Process undertaken for Dicoma PV considers the restrictions and limitations imposed by Government through section 27 (2) of the Disaster Management Act (Act No. 57 of 2002) of 2002 and the Directions issued by the Minister of Forestry and Fisheries (DFFE) in terms of consultations with I&APs. A Public Participation Plan was prepared and submitted to DFFE for approval. Approval of the Plan was provided by the DFFE Case Officer via email on 29 September 2021 (**Appendix B**).

The alternative means of undertaking consultation have been designed and implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to access project information and raise comments on the project through an interactive web-based platform (i.e. online stakeholder

engagement platform) readily available and accessible to any person registering their interest in the project, and ensures that the public participation process is undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014 as amended. The Public Participation Plan (**Appendix C**) considers the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, as well as limitations which certain I&APs may have in terms of access to computers and internet as well as access to public spaces currently not open for operation that inhibits access to hard copy documentation. The online stakeholder engagement platform implemented by Savannah Environmental for the project allows the EAP to visually present details regarding the project as well as consultation documentation, including project maps and plans, presentations and posters. The platform also contains the Scoping Report available for review. The use of an online tool enables stakeholders and I&APs to explore the project-specific content in their own time, and still enables them to participate in a meaningful way in the consultation process.

The sharing of information forms the basis of the public participation process and offers the opportunity for I&APs to become actively involved in the EIA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the EIA process in the following ways:

- During the **Scoping Phase**:
  - provide an opportunity to submit comments regarding the project;
  - assist in identifying reasonable and feasible alternatives, where required;
  - identify potential issues of concern and suggestions for mitigation measures
  - contribute relevant local information and knowledge to the environmental assessment.
  - allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
  - foster trust and co-operation;
  - generate a sense of joint responsibility and ownership of the environment;
  - comment on the findings of the Scoping Phase results; and
  - Identify issues of concern and suggestions for enhanced benefits.

- During the **EIA Phase**:
  - contribute relevant local information and knowledge to the environmental assessment;
  - verify that issues have been considered in the environmental investigations as far as possible as identified within the Scoping Phase;
  - comment on the findings of the environmental assessments; and
  - attend a Focus Group Meeting to be conducted for the project.

- During the **decision-making phase**:
  - to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The Public Participation process therefore aims to ensure that:
- Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review;
- The information presented during the public participation process is presented in such a manner, i.e. local language and technical issues, that it avoids the possible alienation of the public and prevents them from participating;
- Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project;

- A variety of mechanisms are provided to I&APs to correspond and submit their comments i.e. fax, post, email, telephone, text message (SMS and WhatsApp); and
- An adequate review period is provided for I&APs to comment on the findings of the Scoping and EIA Reports.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks are required to be undertaken:

- Fix a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application.
- Give written notice to:
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners 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;
  - (iv) 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;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority.
- Place an advertisement in a local newspaper.
- Open and maintain a register of I&APs and Organs of State.
- Release of a Scoping Report for a 30-day review and comment period.
- Prepare a Comments and Responses (C&R) report which documents the comments received on the EIA process and during the 30-day review and comment period of the Scoping Report and the responses provided by the project team.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), and the approved Public Participation Plan, the following summarises the key public participation activities implemented. The schematic below provides an overview of the tools that are available to I&APs and stakeholders to access project information and interact with the public participation team to obtain project information and resolve any queries that may arise, and to meet the requirements for public participation.

i. Stakeholder identification and register of I&APs	•Register as an I&AP on the online platfrom via completion of a form and provison of contact information, by responding to an advert, or sending a 'please call me' which will be responded to •State interest in the project •Receive all project related information via email
ii. Advertisments and notifications	•Advertisements, site notices and/or radio live reads and notifications provide information and details on where to access project information •Notifications regarding the EIA proceses and availability of project reports for public review to be sent via email, post or SMS notifications
iii. Public Involvement and consultation	•Distribution of a BID providing details on the project and how I&APs can become involved in the process •Submission of comments or queries via the online platform to the PP team •Availability of project information via the online platform •An opportunity for I&APs and stakeholders to request virtual meetings with the project team. •Direct in-person consultation will only take place in limited numbers and where sanitary conditions can be maintained at all times.
iv. Comment on the Scoping and EIA Reports	•Availability of the project reports via the online platform for 30-day comment period •Submission of comments via the online platform, email or post to the PP team •Comments recorded and responded to, as part of the process
v. Identification and recording of comments	•Comments and Responses Report, including all comments received, and included within the final Report for decision-making

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
    (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
    (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
    (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the

greater surrounding area and a registration process involving the completion of a reply form. Key stakeholders and affected and surrounding landowners have been identified and registered on the project database. Other stakeholders are required to formally register their interest in the project through either directly contacting the Savannah Environmental Public Participation team via phone, text message (SMS and WhatsApp), email or fax, or registering their interest via the online stakeholder engagement platform. An initial list of key stakeholders identified and registered is listed in **Table 5.2**.

Table 5.2: Initial list of Stakeholders identified for the inclusion in the project database during the public participation process for Dicoma PV facility

Organs of State
National Government Departments
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Mineral Resources and Energy (DMRE)
Department of Agriculture,Land Reform, and Rural Development (DALRRD:
Department of Human Settlements, Water and Sanitation
Department of Communications
Government Bodies and State-Owned Companies
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
South African Civil Aviation Authority (CAA)
South African Heritage Resources Agency (SAHRA)
South African National Roads Agency Limited (SANRAL)
Telkom SA SOC Ltd
Provincial Government Departments
North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT)
North West Department of Public Works and Roads (NW DPWR)
North West Provincial Heritage Resources Agency (NW PHRA) – provincial Heritage Authority
North West Department of Community Safety and Transport Management (NW DCSTM)
Local Government Departments
Ngaka Modiri Molema District Municipality
Ditsobotla Local Municipality – including the Ward Councillor, ward committee members, community representative or local community forum members
Commenting Stakeholders
BirdLife South Africa
Endangered Wildlife Trust (EWT)
Wildlife and Environment Society of South Africa (WESSA)
Agri SA HQ Natural Resources
Agri North West
Landowners
Affected landowners, tenants and occupiers
Neighbouring landowners, tenants and occupiers

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names[19] of:

[19] Contact details and addresses have not been included in the I&AP database as this information is protected by the Protection of Personal Information Act (No 4 of 2013).

- all persons who requested to be registered on the database through the use of the online stakeholder engagement platform or in writing and disclosed their interest in the project;
- all Organs of State which hold jurisdiction in respect of the activity to which the application relates; and
- all persons who submitted written comments or attended virtual meetings (or in-person consultation where sanitary conditions can be maintained) and viewed the narrated presentations on the Savannah Environmental online platform during the public participation process.

I&APs have been encouraged to register their interest in the EIA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the EIA process. The database of I&APs will be updated throughout the EIA process and will act as a record of all I&APs involved in the public participation process.

ii. Advertisements and Notifications

40.(2)(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.
40.(2)(b)	Giving written notice, in any of the manners provided for in section 47Dof the Act, to – (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control 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 and to any alternative site where the activity is to be undertaken; (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) The municipality which has jurisdiction in the area; (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) Any other party as required by the competent authority.
40.(2)(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;
40.(2)(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
40.(2)(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; (ii) Disability; or (iii) Any other disadvantage.

The EIA process was announced with an invitation to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- Compilation of a background information document (BID) (refer to **Appendix C3**) providing technical and environmental details on the project and how to become involved in the EIA process.

The BID and the process notification letter announcing the EIA process, notifying Organs of State, potentially affected and neighbouring landowners, as well as registered stakeholders/IAPs of Dicoma PV, and providing background information of the project and inviting I&APs to register on the project's database were distributed via email on **14 October 2021**. The evidence of the distribution is contained in **Appendix C** of the Scoping Report. The BID is also available electronically on the Savannah Environmental website (https://savannahsa.com/public-documents/energy-generation/houthaalbomen-pv-cluster/).

- Placement of site notices announcing the EIA process at visible points along the boundary of the development area (i.e. the boundaries of the affected property), in accordance with the requirements of the EIA Regulations on **12 October 2021**. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C** of the Scoping Report.
- Placement of an advertisement in the Noordwester Newspaper on **15 October 2021** announcing the 30-day review and comment period (**Appendix C**). This advert:
  - announced the project and the associated EIA process,
  - announced the availability of the Scoping report, the review period, and where it is accessible for review,
  - invited comment on the Scoping Report, and
  - provided all relevant details to access the Savannah Environmental online stakeholder engagement platform.
- A copy of the newspaper advert as sent to the newspaper is included in **Appendix C** of the Scoping Report.
- The Scoping Report has been made available for review by I&APs for a 30-day review and comment period from **15 October 2021** to **15 November 2021**. The full Scoping Report is available on the Savannah Environmental website. The evidence of distribution of the Scoping Report will be included in the Final Scoping Report, which will be submitted to the DFFE.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the surrounding area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

Table 5.3: Public involvement for Dicoma PV

Activity	Date
Distribution of the BID, process notification letters and stakeholder reply form announcing the EIA process and inviting I&APs to register on the project database. The BID and electronic reply form was also made available on Savannah Environmental's website.	14 October 2021
Placement of site notices.	12 October 2021
Advertising of the availability of the Scoping Report for a 30-day review and comment period in Noordwester Newspaper, including details on how to access the Scoping Report via Savannah Environmental's website	15 October 2021
Distribution of notification letters announcing the availability of the Scoping Report for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the surrounding area (including neighbouring landowners) and key stakeholder groups.	14 October 2021
30-day review and comment period of the Scoping Report.	15 October 2021 – 15 November 2021
Virtual meetings through the use of virtual platforms as determined through discussions with the relevant stakeholder group: » Landowners » Authorities and key stakeholders (including Organs of State, local municipality and official representatives of community-based organisations). » Interested & Affected Parties (I&APs)	Meeting with Ward Councillors (Ward 1 and Ward 16): 12 October 2021 To scheduled throughout the EIA process
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs.	Throughout the EIA process

iv. Registered I&APs entitled to Comment on the Scoping Report

43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –

(a) A lack of skills to read or write;
(b) Disability; or
(c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter of the release of the Scoping Report for a 30-day review and comment period, invited to provide comment on the Scoping Report, and informed of the manner in which, and timeframe within which such comment must be made. The report has been made available in soft copies to I&APs due to restrictions and limitations on public

spaces and limitations in ensuring sanitary conditions of hard copy documents during the national state of disaster related to COVID-19. No hard copies of the report have been made available for review and comment.

The Scoping Report has also been made available on the Savannah Environmental website (i.e. online stakeholder engagement platform) (https://www.savannahsa.com/public-documents/energy-generation/Dicoma-solar-development/). The notification was distributed prior to commencement of the 30-day review and comment period, on **14 October 2021**. Where I&APs are not able to provide written comments (including SMS and WhatsApp), other means of consultation, such as telephonic discussions are used to provide the I&APs with a platform to verbally raise their concerns and comments on the proposed development.

All comments raised as part of the discussions and written comments submitted during the 30-day review and comment period will recorded and included in **Appendix C** of the final Scoping Report.

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the Scoping Phase will be synthesised into a Comments and Responses (C&R) Report which will be included in **Appendix C** of the Final Scoping Report. These will include written comments received. The C&R Report will include detailed responses from members of the EIA project team and/or the project proponent to the issues and comments raised during the public participation process.

The C&R Report will be updated with all comments received during the 30-day review and comment period and will be included as **Appendix C** in the Final Scoping Report that will be submitted to the DFFE for approval.

5.5.3 Finalisation of the Scoping Report

The final stage of the Scoping Phase entails the recording and capturing of comments received from stakeholders and I&APs on the Scoping Report in order to finalise the Scoping Report for submission to DFFE for decision-making. All written comments received will be addressed within the C&R Report (**Appendix C**).

5.6 Evaluation of Issues Identified through the Scoping Process

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations 19 and 21 of the EIA Regulations.

The requirement for the submission of a Screening Report (included as **Appendix L** of the Scoping Report) for the Dicoma PV facility is applicable as it triggers Regulation 19 of the EIA Regulations, 2014 (as amended). **Table 5.4** provides a summary of the specialist assessments identified in terms of the screening tool and responses to each assessment from the project team considering the project site under consideration.

Table 5.4: Sensitivity ratings from the DFFE's web-based online Screening Tool associated with the development of the Dicoma PV facility

Specialist Assessment	Sensitivity Rating as per the Screening Tool (relating to the need for the study)	Project Team Response
Agricultural Impact Assessment	High	The Soils and Agricultural scoping study is included in this Scoping Report as **Appendix F**. Based on the outcome of the desktop analysis of available data as well as the data obtained during the site visit, it has been concluded that the entire development area have medium sensitivity to the development from the perspective of soil and agricultural potential conservation. The impacts to soils and agriculture will be further assessed during the EIA phase.
Landscape/Visual Impact Assessment	Very high	A Visual scoping study is included as **Appendix H** in this Scoping Report. The fact that some components of the proposed Dicoma PV Facility and Associated Infrastructure may be visible does not necessarily imply a high visual impact. Sensitive visual receptors within (but not restricted to) a 3km buffer zone from the facility need to be identified and the severity of the visual impact assessed within the EIA phase.
Archaeological and Cultural Heritage Impact Assessment	Low	A Heritage Screening (which covers both archaeological and cultural aspects of the project site) is included in this Scoping Report as **Appendix G**. Heritage impacts will be further assessed during the EIA phase.
Palaeontology Impact Assessment	Very High	A Heritage Screening (which covers palaeontological aspects of the project site) is included in this Scoping Report as **Appendix G.** Paleontological impacts will be further assessed during the EIA phase.
Terrestrial Biodiversity Impact Assessment	Very high	An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as **Appendix D** of the Scoping Report. Based on the outcomes of the desktop study and available data, it has been indicated that the development area falls within the areas identified as Low to Medium-Low Sensitivity. The impacts will be further assessed during the EIA phase.
Aquatic Biodiversity Impact Assessment	Very high	An Ecological scoping study (including freshwater) has been undertaken for the PV facility and is included as Appendix D of the Scoping Report. No wetlands or watercourse features are located within the project site as well as within the 500m regulated area, and no surface freshwater resource features will be impacted by the proposed development and as such further assessments relating to freshwater resource features during the EIA phase will not be necessary.
Avian Impact Assessment	High	An Avifauna scoping study (including winter season monitoring as per the BirdLife SA Best Practice Guidelines) has been undertaken for the PV facility and included as **Appendix E** of the Scoping Report. Based on the outcome of the desktop study and available data, it has been concluded that the development area has medium Sensitivity. The impacts will be further assessed during the EIA phase.

Civil Aviation Assessment	Medium	The Civil Aviation Authority will be consulted throughout the Scoping/EIA process to obtain input.
Defence Assessment	Low	A defence of military base is not located within close proximity to the PV facility.
RFI Assessment	Medium	The project site under consideration for is located within 1km from a telecommunications tower.
Plant Species Assessment	Medium	An Ecological scoping study (including flora and fauna) has been undertaken for the PV facility and is included as **Appendix D** of the Scoping Report. Based on the outcomes of the desktop study and available data, it has been indicated that the development area falls within the areas identified as Low to Medium-Low Sensitivity. The impacts will be further assessed during the EIA phase.
Animal Species Assessment	Low	

Issues (both direct and indirect environmental impacts) associated with the Dicoma PV facility identified within the scoping process have been evaluated through specialist studies by specialist consultants. These specialists include:

Specialist	Area of Expertise	Refer Appendix
Gerhard Botha - Nkurenkuru Ecology & Biodiversity	Ecology (Terrestrial and Freshwater)	Appendix D
Lukas Niemand – Pachnoda Consulting	Avifauna	Appendix E
Marine Pienaar – TerraAfrica	Soils & Agricultural Potential	Appendix F
Jenna Lavin – CTS Heritage	Heritage (including archaeology, cultural landscape and palaeontology)	Appendix G
Lourens du Plessis - LOGIS	Visual	Appendix H
Nondumiso Bulunga – Savannah Environmental	Social	Appendix I

In order to evaluate issues and assign an order of priority, the following methodology was used to identify the characteristics of each potential issue/impact for each of the proposed project components:

- Identify the **nature** of the potential impact, which includes a description of what causes the effect, what will be affected and how it will be affected.
- Identify the **extent** of the potential impact, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional.
- Identify **sensitive receptors** that may be impacted on by the Dicoma PV and the **types of impacts** that are most likely to occur.
- Evaluate the **significance** of potential impacts in terms of the requirements of the EIA Regulations including nature, significance, consequence, extent, duration and probability of the impacts, the degree to which these impacts a) can be reversed; (b) may cause irreplaceable loss of resources; and (c) can be avoided, managed or mitigated.
- Identify the potential impacts that will be **considered further** in the EIA Phase through detailed investigations.

5.7 Assumptions and Limitations of the EIA Process

The following assumptions and limitations are applicable to the EIA process of Dicoma PV:

- All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- It is assumed that the development area for the solar PV facility identified by the developer represents a technically suitable site for the establishment of Dicoma PV which is based on the design undertaken by technical consultants for the project.
- The development footprint (the area that will be affected during the operation phase) will include the footprint for the PV facility and associated infrastructure (i.e. internal access roads, BESS and grid connection infrastructure).
- The Scoping Phase evaluation of impacts has been largely based on desktop studies. This information has been used to inform this Scoping report and will be verified by specialists in the EIA phase to assess the project development footprint for Dicoma PV.

5.8 Legislation and Guidelines that have informed the preparation of this Scoping Report

The following legislation and guidelines have informed the scope and content of this Scoping Report:

- National Environmental Management Act (Act No. 107 of 1998);
- EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended);
- Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations;
- Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for environmental authorisation; and
- International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Several other Acts, standards or guidelines have also informed the project process and the scope of issues addressed and assessed in this Scoping Report. A review of legislative requirements applicable to the proposed project is provided in **Table 5.5**.

Table 5.5: Relevant legislative permitting requirements applicable to Dicoma PV

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right states 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 that:* ∗ *Prevent pollution and ecological degradation,* ∗ *Promote conservation, and* ∗ *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed developments are considered separately and cumulatively. It is also important to note that the "right to an environment clause" includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which may not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326). In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	DFFE – Competent Authority North West DEDECT– Commenting Authority	The listed activities triggered by the proposed project have been identified and are being assessed as part of the EIA process currently underway for the project. The EIA process will culminate in the submission of a Final Scoping Report and a Plan of Study for EIA to DFFE for approval. Considering the capacity of the proposed Dicoma PV facility project (i.e. contracted capacity of 75MW) and the triggering of Activity 1 of Listing Notice 2 (GNR 325) a full Scoping and EIA process is required in support of the Application for EA.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management Act (No 107 of 1998) (NEMA)	In terms of the "Duty of Care and Remediation of Environmental Damage" provision in Section 28(1) of NEMA every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.	DFFE North West DEDECT– Commenting Authority	While no permitting or licensing requirements arise directly by virtue of the proposed project, this section finds application through the consideration of potential cumulative, direct, and indirect impacts. It will continue to apply throughout the life cycle of the project.
Environment Conservation Act (No. 73 of 1989) (ECA)	The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces. The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties. In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).	DFFE North West DEDECT– Commenting Authority Ditsobotla Local Municipality	Noise impacts are expected to be associated with the construction phase of the project. Considering the location of the development area in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community. There is therefore no requirement for a noise permit in terms of the legislation.
National Water Act (No. 36 of 1998) (NWA)	A water use listed under Section 21 of the NWA must be licensed with the Regional DWS, unless it is listed in Schedule 1 of the NWA (i.e. is an existing lawful use), is permissible under a GA, or if a responsible authority waives the need for a licence.	Regional Department of Water and Sanitation	An Ecological scoping study (including freshwater) has been undertaken for the PV facility and is included as **Appendix D** of the Scoping Report. The Dicoma PV facility development has no wetlands or watercourse features are located

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Water use is defined broadly, and includes consumptive and non-consumptive water uses, taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. Consumptive water uses may include taking water from a water resource (Section 21(a)) and storing water (Section 21(b)). Non-consumptive water uses may include impeding or diverting of flow in a water course (Section 21(c)), and altering of bed, banks or characteristics of a watercourse (Section 21(i)).		within the project site as well as within the 500m regulated area, and no surface freshwater resource features will be impacted by the proposed development and as such further assessments relating to freshwater resource features during the EIA phase will not be necessary.
Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)	In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.	Department of Mineral Resources and Energy (DMRE)	Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the project, and as a result a mining permit or EA in this regard is not required to be obtained.
	Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which may be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.		In terms of Section 53 of the MPRDA approval is required from the Minister of Mineral Resources and Energy to ensure that the proposed development does not sterilise a mineral resource that might occur on site.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)	The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas, and provide a standard for acceptable dustfall rates for residential and non-residential areas.	North West DEDECT / Ngaka Modiri Molema District Municipality	In the event that the project results in the generation of excessive levels of dust the possibility could exist that a dustfall monitoring programme would be required for the project, in which case dustfall monitoring results from

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that may exceed the dustfall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme. Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.		the dustfall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed.
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance. Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites. Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority. Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development. Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.	South African Heritage Resources Agency (SAHRA) North West Provincial Heritage Resource Agency) – provincial heritage authority	A Heritage Impact Assessment will be undertaken for the project as per the requirements Section 38 of the NHRA. The Heritage Impact Assessment will be made available in the EIA Phase. Should a heritage resource be impacted upon, a permit may be required from SAHRA or North West Provincial Heritage Resource Agency (NW PHRA) in accordance with of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668).

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process. Three government notices have been published in terms of Section 56(1) of NEM:BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).	DFFE North West DEDECT	Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species. During the survey no plant SCC was recorded. However, four provincially protected plant species were confirmed, namely, (*Hypoxis hemerocallidea, Boophone disticha, Schizocarphus nervosus* and *Delosperma floribundum*) whist a few Vachelia erioloba (national protected tree) were also confirmed, Refer to the Ecological Scoping Study (**Appendix D**). The impacts will be further assessed during the EIA phase.
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person may not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit may only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).	DFFE North West DEDECT	An Ecological scoping study (including freshwater) has been undertaken for the PV facility and is included as **Appendix D** of the Scoping Report. Further impacts will be further assessed during the EIA phase.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)	Section 05 of CARA provides for the prohibition of the spreading of weeds. Regulation 15 of GN R1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species may occur. Regulation 15E of GN R1048 published under CARA provides requirement and methods to implement control measures for different categories of alien and invasive plant species.	Department of Agriculture, Rural Development, and Land Reform (DARDLR)	CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, a weed control and management plan must be implemented. In terms of Regulation 15E (GN R1048) where Category 1, 2 or 3 plants occur a land user is required to control such plants by means of one or more of the following methods: » Uprooting, felling, cutting or burning. » Treatment with a weed killer that is registered for use in connection with such plants in accordance with the directions for the use of such a weed killer. » Biological control carried out in accordance with the stipulations of the Agricultural Pests Act (No. 36 of 1983), the ECA and any other applicable legislation. » Any other method of treatment recognised by the executive officer that has as its object the control of plants concerned, subject to the provisions of sub-regulation 4. » A combination of one or more of the methods prescribed, save that biological control reserves and areas where biological control agents are effective shall not be disturbed by other control methods to the extent that the agents are destroyed or become ineffective.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Forests Act (No. 84 of 1998) (NFA)	According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees as protected. Notice of the List of Protected Tree Species under the National Forests Act (No. 84 of 1998) was published in GNR 734. The prohibitions provide that "no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister".	DFFE	A licence is required for the removal of protected trees. It is therefore necessary to conduct a survey that will determine the number and relevant details pertaining to protected tree species present in the development footprint for the submission of relevant permits to authorities prior to the disturbance of these individuals. An Ecological Impact Assessment will be undertaken as part of the EIA Phase to identify the presence of any protected trees present on site which will require a permit.
National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)	Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it. Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire may start or burn or from whose land it may spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.	DFFE	While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of Dicoma PV, in terms of the preparation and maintenance of firebreaks, and the need to provide appropriate equipment and trained personnel for firefighting purposes.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
Hazardous Substances Act (No. 15 of 1973) (HAS)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.	Department of Health (DoH)	It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may be on site and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the DoH.
National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)	The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities.	DFFE – Hazardous Waste North West DEDECT – General Waste	No waste listed activities are triggered by Dicoma PV, therefore, no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » Any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and » Pollution of the environment and harm to health are prevented.		
National Road Traffic Act (No. 93 of 1996) (NRTA)	The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from	South African National Roads Agency (SANRAL) – national roads North West Department of Public Works and Roads (NWDPWR)	An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits required for vehicles carrying abnormally heavy or abnormally dimensioned loads and transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the on-site substation and BESS components may not meet specified dimensional limitations (height and width) which will require a permit.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	the requirements of the National Road Traffic Act and the relevant Regulations.		
	Provincial Policies / Legislation		
Bophuthatswana Nature Conservation Act. No. 3 of 1973.	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: » Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats may not be destroyed or damaged; » The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; The Act provides lists of protected species for the Province.	North West DEDECT	A collection/destruction permit must be obtained from North West Department of Rural, Environment and Agricultural Development for the removal of any protected plant or animal species found on site. During the survey no plant SCC was recorded. However, four provincially protected plant species were confirmed, namely, (*Hypoxis hemerocallidea, Boophone disticha, Schizocarphus nervosus* and *Delosperma floribundum*) whist a few Vachelia erioloba (national protected tree) were also confirmed, Refer to the Ecological Scoping Study (**Appendix D**). The impacts will be further assessed during the EIA phase.

5.8.1 Best Practice Guidelines Birds & Solar Energy (2017)

The Best Practice Guidelines Birds & Solar Energy (2017) proposed by the Birds and Renewable Energy Specialist Group (BARESG) (convened by BirdLife South Africa and the Endangered Wildlife Trust) contain guidelines for assessing and monitoring the impact of solar generation facilities on birds in Southern Africa. The guidelines recognise the impact that solar energy may have on birds, through for example the alteration of habitat, the displacement of populations from preferred habitat, and collision and burn mortality associated with elements of solar hardware and ancillary infrastructure; and the fact that the nature and implications of these effects are poorly understood.

The guidelines are aimed at Environmental Assessment Practitioners (EAPs), avifaunal specialists, developers and regulators and propose a tiered assessment process, including:

(i) Preliminary avifaunal assessment – an initial assessment of the likely avifauna in the area and possible impacts, preferably informed by a brief site visit and by collation of available data; also including the design of a site-specific survey and monitoring project should this be deemed necessary.
(ii) Data collection – further accumulation and consolidation of the relevant avian data, possibly including the execution of baseline data collection work (as specified by the preliminary assessment), intended to inform the avian impact study.
(iii) Impact assessment – a full assessment of the likely impacts and available mitigation options, based on the results of systematic and quantified monitoring if this was deemed a requisite at preliminary assessment.
(iv) Monitoring – repetition of baseline data collection, plus the collection of mortality data. This helps to develop a complete before and after picture of impacts, and to determine if proposed mitigation measures are implemented and are effective, or require further refinement. Monitoring may only be necessary for projects with the potential for significant negative impacts on birds (i.e. large area affected and / or vulnerable species present).

In terms of the guidelines the quantity and quality of baseline data required to inform the assessment process at each site should be set in terms of the size of the site and the predicted impacts of the solar technology in question, the anticipated sensitivity of the local avifauna (for example, the diversity and relative abundance of priority species present, proximity to important flyways, wetlands or other focal sites) and the amount of existing data available for the area.

Data collection could vary from a single, short field visit (Regime 1, for e.g. at a small or medium sized site with low avifaunal sensitivity), to a series of multi-day survey periods, including the collection of various forms of data describing avian abundance, distribution and movement and spread over 12 months (Regime 3, for e.g. at a large developments located in a sensitive habitat, or which otherwise may have significant impacts on avifauna). **Table 5.6** is taken from the best practise guidelines and provides a summary of the recommended assessment regimes in relation to proposed solar energy technology, project size, and likely risk).

Table 5.2: Recommended avian assessment regimes in relation to proposed solar energy technology, project size, and known impact risks.

Type of technology*	**Size****	**Avifaunal Sensitivity*****		
		Low	Medium	High
All except CSP power tower	Small (< 30ha)	Regime 1	Regime 1	Regime 2
	Medium (30 – 150ha)	Regime 1	Regime 2	Regime 2
	Large (> 150ha)	Regime 2****	Regime 2	Regime 3
CSP power tower	All	Regime 3		

Regime 1: One site visit (peak season); minimum 1 – 5 days.
Regime 2: Pre- and post-construction; minimum 2 – 3 x 3 – 5 days over 6 months (including peak season); carcass searches.
Regime 3: Pre- and post-construction; minimum 4 – 5 x 4 – 8 days over 12 months, carcass searches.

* Different technologies may carry different intrinsic levels of risk, which should be taken into account in impact significance ratings

** For multi-phased projects, the aggregate footprint of all the phases should be used. At 3ha per MW, Small = < 10MW, Medium = 10 – 50MW, Large = > 50MW.

*** The avifaunal sensitivity is based on the number of priority species present, or potentially present, the regional, national or global importance of the affected area for these species (both individually and collectively), and the perceived susceptibility of these species (both individually and collectively) to the anticipated impacts of development. For example, an area would be considered to be of high avifaunal sensitivity if one or more of the following is found (or suspected to occur) within the broader impact zone:

1) Avifaunal habitat (e.g. a wetlands, nesting or roost sites) of regional or national significance.
2) A population of a priority species that is of regional or national significance.
3) A bird movement corridor that is of regional or national significance.
4) A protected area and / or Important Bird and Biodiversity Area.

An area would be considered to be of medium avifaunal sensitivity if it does not qualify as high avifaunal sensitivity, but one or more of the following is found (or suspected to occur) within the broader impact zone

1) Avifaunal habitat (e.g. a wetland, nesting or roost sites) of local significance.
2) A locally significant population of a priority species.
3) A locally significant bird movement corridor.

An area would be considered to be of low avifaunal sensitivity if it is does not meet any of the above criteria.

**** Regime 1 may be applied to some large sites, but only in instances where there is abundant existing data to support the assessment of low sensitivity.

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g. local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. For this reason, a dry season and wet season bird monitoring survey will be conducted in line with Regime 2 for the Dicoma PV. The dry season survey has already been conducted in August 2021; the findings has been used to inform the avifauna scoping report completed for the Scoping phase. The result from the wet season bird monitoring will be used to inform both the development footprint as well as Avifauna Impact Assessment report, to be completed for the EIA Report.

5.8.2 The IFC Environmental Health and Safety (EHS) Guidelines

The IFC EHS Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). The following IFC EHS Guidelines have relevance to the proposed project:

- IFC EHS General Guidelines
- IFC EHS Guidelines for Electric Power Transmission and Distribution

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, however no Industry Sector EHS Guidelines have been developed for PV solar power to date. The application of the General EHS Guidelines should be tailored to the hazards and risks associated with a project, and should take into consideration site-specific variables which may be applicable, such as host country context, assimilative capacity of the environment, and other project factors. In instances where host country regulations differ from the standards presented in the EHS Guidelines, whichever is the more stringent of the two in this regard should be applied.

The General EHS Guidelines include consideration of the following:

- Environmental:
  - Air Emissions and Ambient Air Quality
  - Energy Conservation
  - Wastewater and Ambient Water Quality
  - Water Conservation
  - Hazardous Materials Management
  - Waste Management
  - Noise
  - Contaminated Land
- Occupational Health and Safety:
  - General Facility Design and Operation
  - Communication and Training
  - Physical Hazards
  - Chemical Hazards
  - Biological Hazards
  - Radiological Hazards
  - Personal Protective Equipment (PPE)
  - Special Hazard Environments
  - Monitoring
- Community Health and Safety:
  - Water Quality and Availability
  - Structural Safety of Project Infrastructure
  - Life and Fire Safety (L&FS)
  - Traffic Safety
  - Transport of Hazardous Materials
  - Disease Prevention
  - Emergency Preparedness and Response
- Construction and Decommissioning:
  - Environment
  - Occupational Health & Safety
  - Community Health & Safety

5.8.3 IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015)

While no Industry Sector EHS Guidelines have been developed for PV Solar Power, the IFC has published a Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (IFC, 2015). Chapter 8 of the Project Developer's Guide pertains to Permits, Licensing and Environmental Considerations, and states that in order to deliver a project which will be acceptable to international lending institutions, environmental and social assessments should be carried out in accordance with the requirements of the key international standards and principles, namely the Equator Principles and IFC's Performance Standards (IFC PS).

Some of the key environmental considerations for solar PV power plants contained within the Project Developer's Guide include:

- Construction phase impacts (i.e. OHS, temporary air emissions from dust and vehicle emissions, noise related to excavation, construction and vehicle transit, solid waste generation and wastewater generation from temporary building sites and worker accommodation).
- Water usage (i.e. the cumulative water use requirements).
- Land matters (i.e. land acquisition procedures and the avoidance or proper mitigation of involuntary land acquisition / resettlement).
- Landscape and visual impacts (i.e. the visibility of the solar panels within the wider landscape and associated impacts on landscape designations, character types and surrounding communities).
- Ecology and natural resources (i.e. habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species).
- Cultural heritage (i.e. impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction).
- Transport and access (i.e. impacts of transportation of materials and personnel).
- Drainage / flooding (i.e. flood risk associated with the site).
- Consultation and disclosure (i.e. consultating with key authorities, statutory bodies, affected communities and other relevant stakeholders as early as possible).
- Environmental and Social Management Plan (ESMP) (i.e. compile an ESMP to ensure that mitigation measures for relevant impacts are identified and incorporated into project construction procedures and contracts).

CHAPTER 6: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the local environment. This information is provided in order to assist the reader in understanding the possible effects of the project on the environment within which the project is proposed to be developed. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the Dicoma PV facility have been described. This information has been sourced from both existing information available for the area as well as collected field data by specialist consultants and aims to provide the context within which this EIA process is being conducted.

6.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of an Impact Assessment Report

This chapter includes the following information required in terms of Appendix 2: Content of a Scoping report:

Requirement	Relevant Section
(g)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	The environmental attributes associated with the development of Dicoma PV is included within this chapter. The environmental attributes that are assessed within this chapter includes the following:
	» The regional setting of the broader study area and the project site indicates the geographical aspects associated with Dicoma PV. This is included in **Section 6.2**.
	» The climatic conditions for the greater Lichtenburg area have been included in **Section 6.3**.
	» The biophysical characteristics of the project site and the surrounding areas are included in **Section 6.4**. The characteristics considered are topography and terrain, geology, soils and agricultural potential and the ecological profile which includes the vegetation patterns, listed plant species, critical biodiversity areas and broad-scale processes, freshwater resources, terrestrial fauna and avifauna.
	» The heritage and cultural aspects (including archaeology and palaeontology) have been included in **Section 6.5**.
	» The social and socio-economic characteristics associated with the broader study area and the project site have been included in **Section 6.6.**

A more detailed description of each aspect of the affected environment will be included in the specialist reports to be included in the EIA report.

6.2. Regional Setting

The Dicoma PV facility development area is located near Lichtenburg in the North West Province. The North West Province is situated in the central-northern extent of South Africa. The province is bordered by Northern Cape Province to the west, and south-west; Free State Province to the south; Gauteng Province to the east; Limpopo Province to the north-east; and Botswana to the north. It occupies an area of land approximately 104 882km² in extent, making it South Africa's 6th largest in terms of area, and 7th most densely populated Province.

The North West Province is characterised by altitudes ranging from 920 – 1782 mamsl, with the central and western extents of the province characterised by gently undulating plains, while the eastern extent is characterised as mountainous (and includes the Magaliesberg mountain range). Ancient igneous rock formations dominate the north-eastern and north-central extent of the province; and the Gatsrand between Potchefstroom and Carletonville is considered to be one of the most ancient, preserved landscapes in the world. The geology of the province is significant given its mineral resources which are rich in platinum, gold, uranium, iron, chrome, manganese and diamonds.

In terms of land use patterns, approximately 69% of the North West Province is in a natural, or near-natural state, while 31% of the province is irreversibly modified as a result of croplands (25.6%), urban (3.5%), and mining (0.7%) activities. The province is predominantly rural with the main economic activities comprising mining and agriculture. The North West Province comprises four Districts, namely Bojanala Platinum, Ngaka Modiri Molema, Dr Ruth Segomotsi Mompati, and Dr Kenneth Kaunda.

The town of Lichtenburg is located in the Ngaka Modiri Molema District Municipality at the centre of the maize triangle, which is considered to be the primary maize growing area within South Africa. As a result, the area's main economic activity is the production of maize (corn). The production of cement is also considered to be a major economic activity with three large cement producers located within 80km of the town. Several factories manufacturing liquid fertilizer, animal feed, and agricultural equipment have also been established in the area. The Lichtenburg area is considered to have a unique historical background and houses a number of places of interest including the Lichtenburg Diggings Museum, Bakerville, the Burning Vlei, Wondergat, and monuments such as the General De la Rey Square.

The proposed project area is characterised by a relative flat to gradual sloping plains-dominated landscape with a low dolerite outcrop to the south of the development footprint. The properties to the north, south and east are mainly small holdings with residential areas and patches of land utilised for small scale subsistence farming. The properties to the west, on the other hand, are larger and utilised mostly for commercial farming practises.

The project site is located approximately 5km west of Eskom's Watershed MTS Substation. The power lines which run parallel to the south include:

- Watershed-Klerksdorp 132kV power line
- Watershed-Sephaku 132kV power line
- Dudfield - Watershed 1 and Dudfield - Watershed 2 88kV power line
- Delareyville Municipal - Watershed 1 88kV power line
- Watershed-Sephaku 88kV line.

Additional power lines within the development area include:

- Watershed-Zeerust 1 132kV power line

- Slurry PPC-Watershed 1 88kV power line
- Watershed-Mmabatho 1 and 2 88kV power line
- Pluto-Watershed 1 275kV power line
- Hera-Watershed 1 275kV power line
- Halfpad Traction-Watershed 1 132kV power line
- Whites North-Watershed 1 and 2 88kV power line
- Lichtenburg Munic-Watershed 1 88kV power line

Access to the project site is obtained via a secondary (gravel) road that joins the regional road R505 located to the east of the project site. The general environment and gravel access road is provided in Figure 6.1 and 6.2

Figure 6.1: General environment within the study area

Figure 6.2: Gravel access road from the R505 arterial road

6.3. Climatic Conditions

The suitability of the site for the development of a solar facility is dependent on the prevailing climatic condition of the area. The viability of the solar farm is directly affected by the amount of solar irradiation

received in the area. The GHI for the North West Province varies between 2 060 and 2 240kWh/m²/annum, which relates to the higher end of the spectrum. The irradiation received in the location of the proposed site is approximately 2 143kWh/m²/annum (refer to **Figure 6.**).

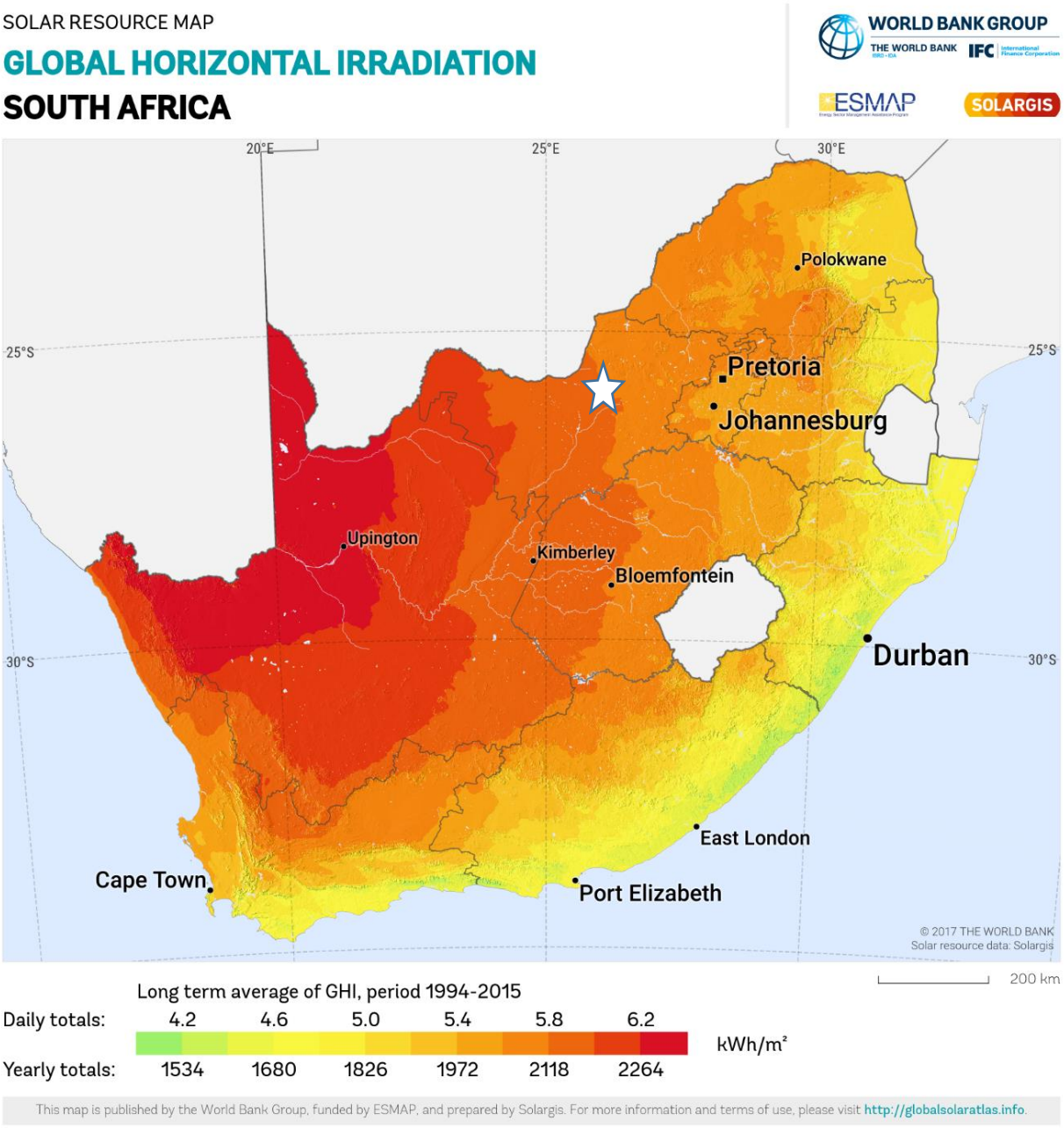

Figure 6.3: GHI map for South Africa (Source: World Bank Group Solar Map). The location of Dicoma PV is shown by the white star on the map

The Lichtenburg area is typically characterised as having a moderate to cold semi-arid climate with wide variations in daily and seasonal temperatures. The area is typically hot in summer and mild-to-cold in winter. The area receives a mean annual average rainfall of approximately 601mm. Precipitation is highest in January with an average of 110mm; and lowest in July and August with an average of 5mm. Minimal rain occurs between May to September. The average annual temperature in Lichtenburg is 16.9°C. January is the hottest month of the year with an average temperature of 21.7°C, while June is the coldest month of the

year with an average temperature of 9.9°C (refer to **Figure 6.4** and **Table 6.1**). Frost is frequent to very frequent during winter, with up to 37 mean frost days per year. Droughts and floods are a regular occurrence at both provincial and local scales and play a significant role in almost every aspect of the social, economic, and ecological environment within the province.

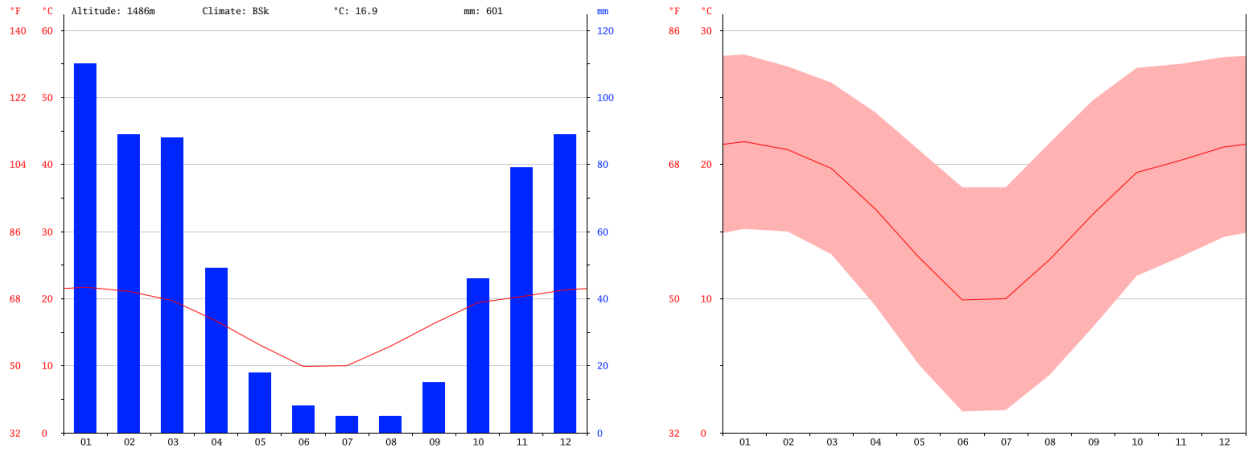

Figure 6.4: Climate and Temperature graphs for Lichtenburg, North West Province (Source: en.climate-data.org).

Table 6.1: Climate data for Lichtenburg, North West Province (Source: en.climate-data.org).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Temp. (˚C)	21.7	21.1	19.7	16.7	13.1	9.9	10	12.9	16.3	19.4	20.3	21.3
Minimum Temp. (˚C)	15.2	15	13.3	9.5	5.1	1.6	1.7	4.3	7.9	11.7	13.1	14.6
Maximum Temp. (˚C)	28.2	27.3	26.1	23.9	21.1	18.3	18.3	21.6	24.8	27.2	27.5	28
Precipitation (mm)	110	89	88	49	18	8	5	5	15	46	79	89

6.4. Biophysical Characteristics of the Development Area

The following section provides an overview of the biophysical characteristics of the development area.

6.4.1. Topographical profile

The topography or terrain morphology of the region is broadly described as Plains and Pans or Slightly Undulating Plains of the Central Interior Plain. The slope of the entire study area is extremely even (flat) with a very gradual drop (approximately 70m) from the northern section of the study area (1520m amsl) to the Die Vlei River (1450m) which flows through Lichtenburg. This perennial river, wetlands and farm dams near this town, account for the dominant hydrological features within this region that receives between 500mm to 650mm rainfall per annum.

6.4.2. Geology, Soils and Agricultural Potential

i. Geological profile

The geology of the development area comprises dolomite and chert belonging to the Chuniespoort Group (AGIS), supporting mostly shallow Mispah and Glenrosa soil forms typical of the Fa land type (Mucina & Rutherford, 2006). Chert gravels are abundant on midslopes and footslopes including valley bottoms (AGIS, 2014).

The project site overlies Precambrian (Proterozoic) dolomites and associated marine sedimentary rocks that are assigned to the Malmani Subgroup (Chuniespoort Group) within the Transvaal Supergroup. The 2km-thick Malmani Subgroup succession consists of a series of formations of stromatolitic and oolitic carbonates (limestones and dolomites), cherts, and black carbonaceous shales. The bedrock unit represented at the project site is the Monte Christo Formation that comprises some 300m to 500m of breccias as well as stromatolitic and oolitic platform carbonates, including cherty dolomites. The Malmani carbonates in the project site have been subject to karstic (solution) weathering processes with near-surface concentration of insoluble materials (chert, ferromanganese minerals, etc.) through secondary precipitation and downwasting.

The diamond deposits in the Lichtenburg area are associated with weathered, kaolinitised alluvial or eluvial (residual) gravels of Late Cretaceous or younger Tertiary age that may have been associated with south-flowing tributaries of the palaeo-Harts drainage system across the Cargonian palaeo-highlands (De Wit 1981, De Wit et al. 2000, Partridge et al. 2006, cf Dollar 1998). Surface gravels in the project site are dominated by cherty, and dolomitic clasts, downwasted from the Malmani dolomites. Surface exposures of pedogenic calcrete overlying the dolomitic bedrocks may also be present in some localities.

ii. Soils and agricultural capability

Existing soil information was obtained from the Land Type database (Land Type Survey Staff, 1972 – 2002). The land type data is presented at a scale of 1:250 000 and entails the division of land into land types, typical terrain cross sections for the land type and the presentation of dominant soil types for each of the identified terrain units.

The Dicoma PV development area consists wholly of Land Type Fa11 (refer to **Figure 6.5**)

The soil profiles classified within the Dicoma PV development area consist of the Glenrosa, Mispah and Nkonkoni forms. The Glenrosa soils are present at around 80% of the area, while the Mispah forms are found at 15%, and the remaining 5% is Nkonkoni soils. The Glenrosa soils range in depth between 0.25m and 0.40m, while the Mispah soils are between 0.05m and 0.20m deep. The Nkonkoni soils are between 0.40m and 0.90m deep.

There are no crop field boundaries within the Dicoma PV development area. Crop fields with rainfed annual crops and planted pastures as well as centre pivot irrigation are present near the development area. More pivot irrigation is present about 8km north and 4km north-east of the site.

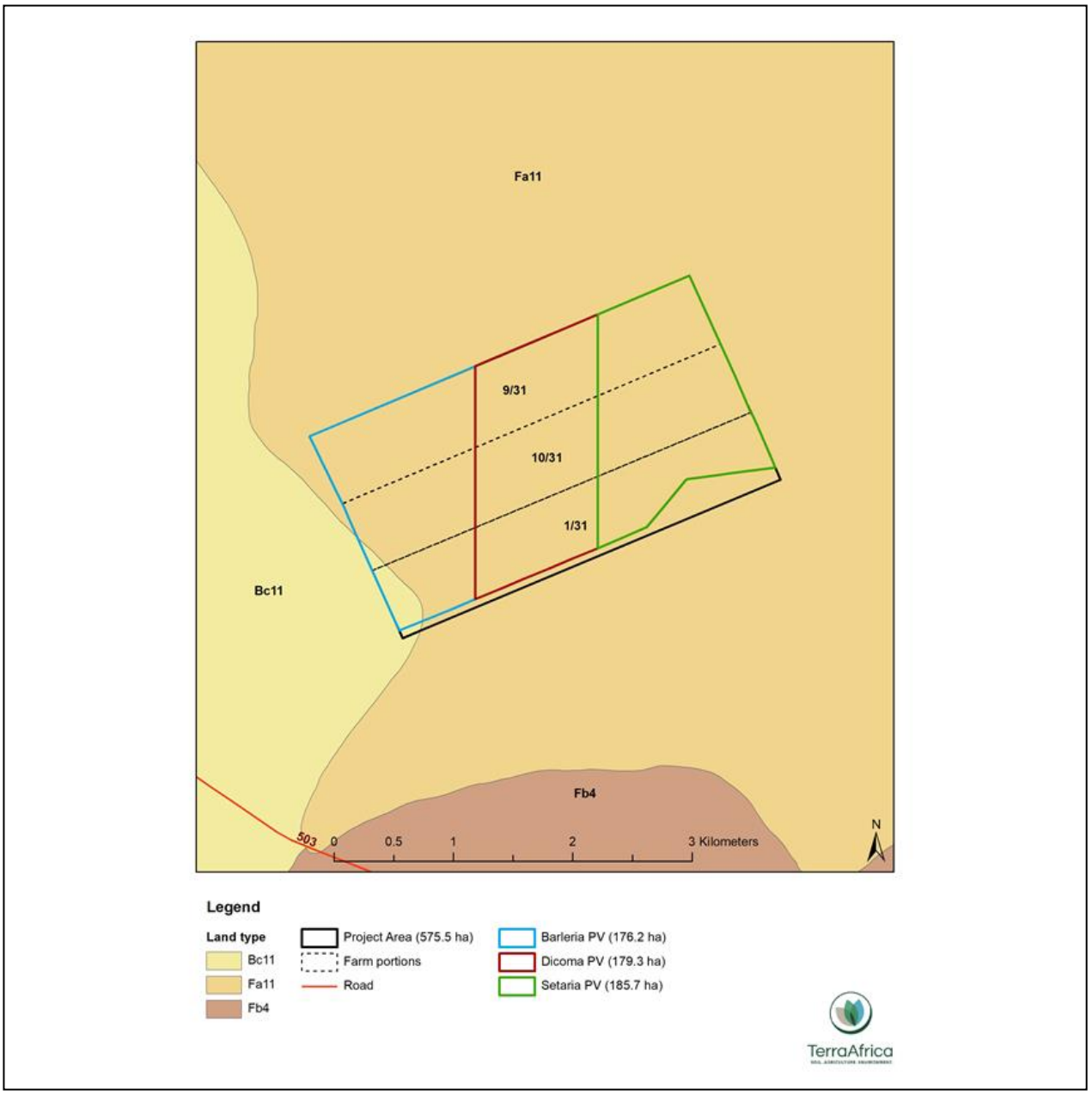

Figure 6.5: Land type map of the proposed Dicoma PV facility (shown in Blue) Including

iii. Land use and carrying capacity

The current land use of the site is extensive livestock farming with cattle. The available grazing consists of natural veld and there are no planted pastures and no grass harvesting and baling. The grazing capacity of the development area is 8ha/LSU (moderate grazing capacity). The development area, therefore, has the capacity to feed 22 head of cattle. The surrounding land uses include irrigated and rainfed production of grain crops to the west of the site while the areas located north, east and south of the site are used for livestock farming.

6.4.3. Ecological Profile of the Study Area and the Development Area

i. Vegetation description and associated habitats

The overall project area is situated within the Grassland Biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

» Seasonal precipitation; and
» The minimum temperatures in winter (Mucina & Rutherford, 2006).

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Therefore, trees are typically absent, except in a few localised habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

The grassland biome comprises many different vegetation types. The entirety of the PV facility footprint is located within the Carletonville Dolomite Grassland vegetation type (Gh15) according to Mucina and Rutherford (2006) (refer to **Figure 6.6**).

» **Carletonville Dolomite Grassland**

The distribution of the vegetation type is mostly found within the North West Province extending into Gauteng and a small portion of the Free State Province. This vegetation type is mostly associated with the Potchefstroom, Ventersdorp and Carletonville regions, extending westwards to the vicinity of Ottoshoop, but also occurring as far east as Centurion and Bapsfontein in Gauteng. This vegetation type is mainly found between elevations of 1 360m and 1 620m, but mostly between 1 500m and 1 560m. This vegetation type has been described by Mucina and Rutherford (2006) as species-rich grasslands forming a complex mosaic pattern across slightly undulating plains dissected by prominent rocky chert ridges. Depending on specific underlying geology and soils, the species composition of plant communities varies in a complex mosaic pattern, and several species may be co-dominant.

Typical plant communities are dominated by the grasses *Brachiaria serrata*, *Cynodon dactylon, Digitaria tricholaenoides, Diheteropogon amplectans, Themeda triandra, Eragrostis chloromelas, Setaria sphacelata*, and *Heteropogon contortus*. Prominent forbs and low shrubs include *Acalypha angustata, Dicoma macrostegia, Crabbea angustifolia, Dicoma anomala*, and several *Helichrysum* species. The diversity of perennial grasses and forbs is typically high for these grasslands.

The typical low grasslands are interspersed with a low density of high shrubs and low trees. Most of these are *Acacia, Ziziphus* and *Searsia* species.

» **Important Plant Taxa**

Important plant taxa are those species that have a high abundance, a frequent occurrence or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are important in the Carletonville Dolomite Grassland.

Graminoids: *Aristida congesta, Brachiaria serrata, Cynodon dactylon, Digitaria tricholaenoides, Hiheteropogon ampletens, Eragrostis chloromelas, E. racemosa, Heteropogon contortus, Loudetia simplex, Schizachyrium sanguineum, Setaria sphacelata, Themeda triandra, Alloteropsis semilata subsp. eckloniana, Andropogon schirensis, Aristida canescens, A. diffusa, Bewsia bifola, Bulbostylis burchellii, Cymbopogon caesius, Elinonurus muticus, Eragrostis curvula, E. gummiflua, E. plantana, Eustachys paspaloides, Hyparrhenia hirta, Melinis nerviglumis, M. repens subsp. repens, Monocymbium ceresiiforme, Panicum*

coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides, Tristachya leucothrix, T. rehmannii.

Herbs: *Acalypha angustata, Chamaecrista mimosoides, Euphorbia inaequilatera, Crabbea angustifolia, Dianthus mooiensis, Dicoma anomala, Helichrysum caespititium, H. miconiifolium, H. nudifolium var. nudifolium, Ipomoea ommaneyi, Justicia anagalloides, Kohautia amatymbica, Kyphocarpa angustifolia, Ophrestia oblongifolia, Pollichia campestris, Senecio coronatus, Hillardia oligocephala*.

Geophytic Herbs: *Boophane disticha (Declining – Red List), Habenaria mossii*

Succulent Herb: *Tripteris aghillana var. integrifolia*

Low Shrubs: *Anthospermum rigidum subsp. pumilum, Indigofera comosa, Pygmaethamnus zeyheri var. rogersii, Searsia magaliesmontana, Tylosema esculentum, Ziziphus zeyheriana* (Mucina & Rutherford, 2006). Geoxylic Suffrutex: *Elephantorrhiza elephantina, Parinari capensis subsp. capensis*

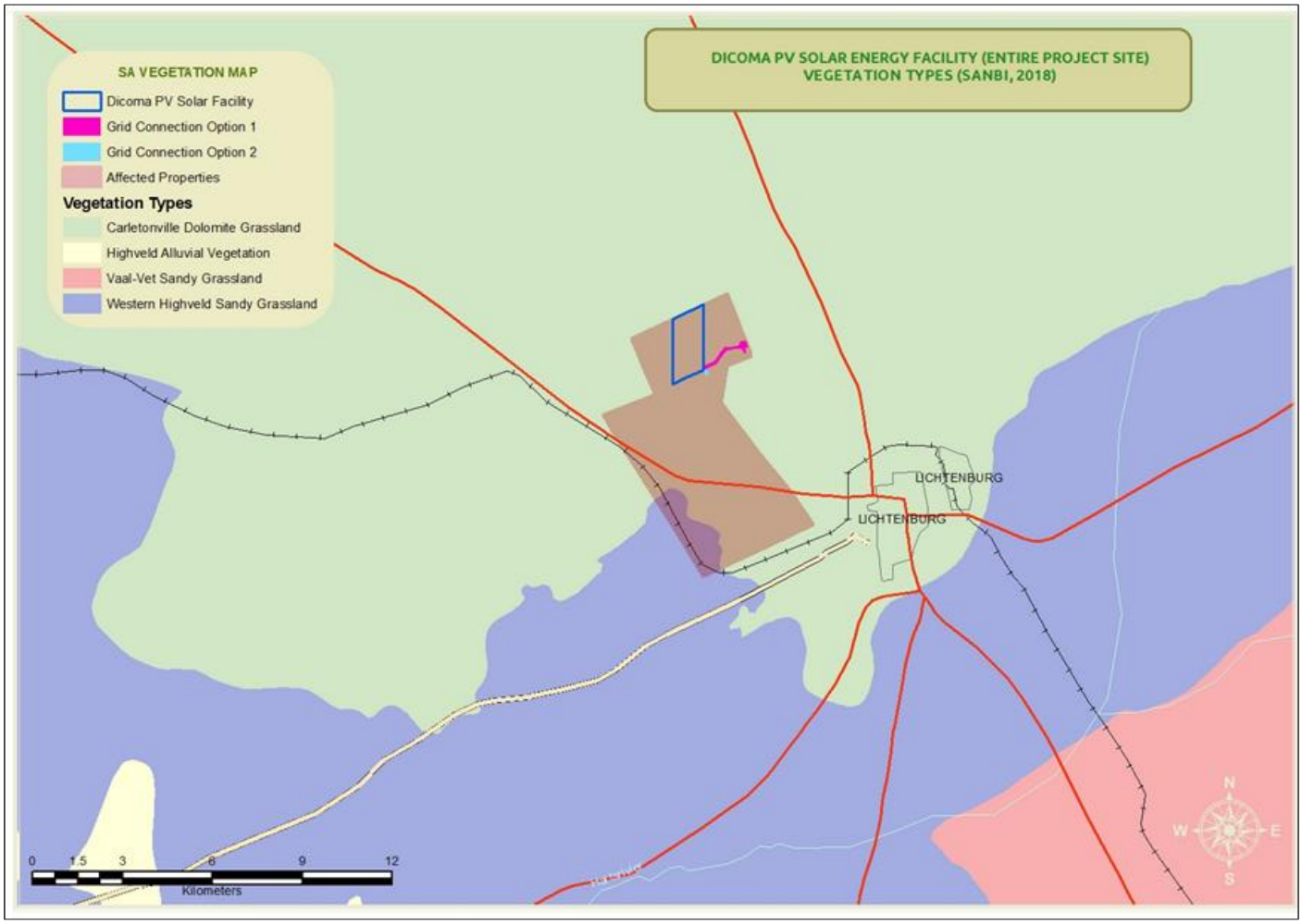

Figure 6.6: Vegetation types mapped across the Dicoma PV development area (SANBI, 2018)

ii. Fauna

a) Amphibians

Based on the IUCN Red List Spatial Data (IUCN, 2017), 19 amphibian species can be expected to occur within the vicinity of the project site, and according to the distribution maps of Du Preez & Carruthers (2009) and Minter *et al*. (2004) a total of 21 amphibian species may be found within the region. According to both resources, one amphibian species of conservation concern could be present within the region where suitable habitat is present namely *Pyxicephalus adspersus* (Giant Bullfrog).

Of the 21 amphibian species that have a distribution that includes the study area, only 12 are known to occur in QDSs 2625BB, 2626AA, 2525DD and 2526CC (FrogMap, 2018). No amphibian Species of Conservation Concern (SCC) were recorded within the relevant QDSs.

Due to the relatively homogenous nature of the project site, the absence of freshwater resource features, it is expected that the diversity within the study area itself will be very low. No amphibian species were recorded during the specialist's site survey.

b) Reptiles

Based on the IUCN Red List Spatial Data (IUCN, 2017), 55 reptilian species can be expected to occur within the vicinity of the project site, and according to the distribution maps of Bates *et al*. (2014) a total of 71 terrestrial reptilian species may be found within the region. According to both resources, none of these species are listed red data species or significantly range restricted (reptile SCC). However, one species is nationally protected (TOPS) namely, the Southern African Python (*Python natalensis)*.

Of the 71 reptilian species that have a distribution that includes the study area, 28 are known to occur in QDSs 2625BB, 2626AA, 2525DD and 2526CC (ReptileMap, 2021), and includes the Southern African Python (TOPS). Furthermore, of these species recorded within the relevant QDSs, 13 species are endemic/ near endemic to South Africa.

Due to the relatively homogenous nature of the study area, it is expected that the diversity within the study area itself will be relatively low.

Indeed, during the specialist's site survey only three reptile species were recorded[20], with none of these species regarded as SCC. It is expected that slightly more reptilian species will be recorded during the warmer, wetter months (summer to early autumn), it is still expected that diversity will be quite low.

c) Mammals

Based on the IUCN Red List Spatial Data (IUCN, 2017), 84 mammal species can be expected to occur within the vicinity of the project site. Of these species, 12 are medium to large conservation dependant species, such as *Diceros bicornis* (Hook-lipped Rhinoceros) and *Equus quagga* (Plains Zebra) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project site and are removed from the expected SCC list. Of the remaining 72 small- to medium sized mammal species, ten (10) are listed as being of conservation concern on a regional or global basis. According to Skinner & Chimimba (2005) and Apps (2012), the potential diversity of mammals within the

[20] This very low diversity may be attributed to the time of the survey, as most reptiles are inactive during the colder, drier months.

region is slightly higher high with as many as 98 terrestrial mammals potentially occurring within the area. Of the 98 mammals that have a distribution that includes the study area, 77 are known to occur in QDSs 2625BB, 2626AA, 2525DD and 2526CC (MammalMap, 2021). Of the species that have a distribution that includes the study area, 11 species are regarded as mammal SCC (refer to **Table 6.3**).

The list of potential species includes:

- Five (5) that are listed as Vulnerable (VU) on a regional basis; and
- Nine (6) that are listed as Near Threatened (NT) on a regional scale.

There are several factors which will reduce the actual number of species present with the study area. This includes the largely homogenous nature of the project site, the fractured landscape, surrounding agricultural practices (especially cultivation), the presence of large roads and other anthropogenic activities. Due to these factors, it is expected that the diversity within the study area itself will be moderate to low.

A number of antelope species have been recorded by the ADU (Animal Demographic Unit) within the QDSs. Most of these antelope species are confined by fences and occur only where farmers have introduced them or allow them to persist and should be considered as part of the farming system rather than as wildlife. Some of these South African indigenous antelope species do not have a natural distribution within the specific region but as mentioned have been introduced by farmers. Such antelope species include; Blue Wildebeest (*Connochaetes taurinus*), Grey Rhebok (*Pelea capreolus*), Mountain Reedbuck (*Redunca fulvorufula*) Red Hartebeest (*Alcelaphus buselaphus*), Impala (*Aepyceros melampus* subsp. *melampus*) and African Savanna Buffalo (*Syncerus caffer*). As in the case of the IUCN generated species list, these medium to large conservation dependant species have been omitted. Both Duiker (*Sylvicapra grimmi*a) and Steenbok (*Raphicerus campestris)* are adaptable species that are able to tolerate high levels of human activity and are not likely to be highly sensitive to the disturbance associated with the development.

During the specialist's site survey, no mammal SCC were confirmed within the project site.

iii. Alien invasive species

A number of alien invasive species have been recorded in the wider area according to the SANBI database. The extent to which the site contains alien plants will be determined through a detailed field-survey.

iv. Species of Conservation Concern (SCC)

Based on the Plants of Southern Africa (BODATSA-POSA, 2021) database, 453 plant species are expected to occur in the area. Of the 453 -plant species, three are listed Red Data species whilst 16 South African Endemic species have been recorded within the region. Furthermore, according to the generated species list, 12 species have been recorded within the area which is protected under the Transvaal Nature Conservation Ordinance, and one tree species has been recorded which is protected under the National Forest Act namely *Vachellia (Acacia) erioloba* (common name Camel Thorn tree).

A previous study conducted by Strohbach (2013) within the affected properties identified 187 species. Furthermore, this study did not confirm any plant SCC (Red data and range restricted species), however 10 South African Endemic species, five provincially protected and one national protected tree species (*V. erioloba*) were confirmed within the properties comprising the project site.

During the specialist's site survey four provincially protected plant species were confirmed (*Hypoxis hemerocallidea, Boophone disticha, Schizocarphus nervosus* and *Delosperma floribundum*), and a few *Vachelia erioloba* (nationally protected tree) were also confirmed. No plant SCC were confirmed during the site visit (refer to **Table 6.2**).

Table 6.2: List of floral species that are of conservation concern, which may potentially be found in project area

Species	Status	BODATSA-POSA, 2021	Strohbach, 2013	Specialist Site Visit	Likelihood of Occurrence
Nananthus vittatus	DD	X			Low
Cleome conrathii	NT & Endemic	X			Moderate
Brachystelma incanum	VU & Endemic	X			Moderate
Gladiolus elliotii	Protected	X			Low
Gladiolus permeabilis	Protected	X			Moderate
Gladiolus sp.	Protected	X			
Crinum graminicola	Protected	X			Moderate
Crinum macowanii	Protected	X	X		High
Brachystelma foetidum	Protected	X			High
Pelargonium dolomiticum	Protected	X			Moderate
Pelargonium sidoides	Protected	X			High
Habenaria epipactidea	Protected	X			Low
Acacia erioloba	Protected	X	X	X	Confirmed
Boophone disticha	Protected	X	X	X	Confirmed
Schizocarphus nervosus	Protected	X		X	Confirmed
Hypoxis hemerocallidea	Protected	X	X	X	Confirmed
Delosperma floribundum	Protected	X	X	X	Confirmed

Table 6.3: List of mammal species of conservation concern that may occur in the project area (IUCN, 2017; SANBI, 2016)

Species	Common Name	Conservation Status		Likelihood of Occurrence
		Red Data	IUCN	
Anonyx capensis	Cape Clawless Otter	NT	NT	Low
Atelerix frontalis	South African Hedgehog	NT	LC	High
Felis nigripes	Black-footed Cat	VU	VU	Low
Hydrictis maculicollis	Spotted-necked Otter	VU	NT	Low
Leptailurus serval	Serval	NT	LC	Moderate
Mystromys albicaudatus	White-tailed Rat	VU	EN	Moderate
Crocidura mariquensis	Swamp Musk Shrew	NT	DD	Low
Smutsia temminckii	Ground Pangolin	VU	VU	Low
Panthera pardus	Leopard	VU	VU	Low
Parahyaena brunnea	Brown Hyena	NT	NT	Moderate
Poecilogale albinucha	African Striped Weasel	NT	LC	Moderate

v. Critical Biodiversity Areas and Conservation Targets

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision-making tools. The use of CBAs within the North West Province follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008).

According to the guidelines for bioregional plans, three basic CBA categories can be identified based on three high-level management objectives

CBA Category	Land Management Objective
Critical Biodiversity Areas (CBAs) Definition: CBAs are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses.	
CBA 1 and Protected Areas	Natural landscapes: » Ecosystems and species fully intact and undisturbed » These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met. » These are landscapes that are at or past their limits of acceptable change.
CBA 2	Near-natural landscapes: » Ecosystems and species largely intact and undisturbed. » Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets. » These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESAs) Definition: ESAs are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water and food provision, or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.	
ESA	Functional landscapes: » Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. » Individual species or other biodiversity indicators may be severely disturbed or reduced. » These are areas with low irreplaceability with respect to biodiversity pattern targets only.
ONA	Production landscapes: » Manage land to optimise sustainable utilization of natural land.

The proposed Dicoma PV facility falls within the planning domain of the Northwest Province Biodiversity Conservation Assessment which maps Terrestrial and Aquatic Critical Biodiversity Areas and Ecological Support Areas within the North West Province. In terms of the North West Biodiversity Sector Plan (NWBSP, 2015) Terrestrial and Aquatic Critical Biodiversity Areas, the site is located within the Ecological Support Areas (ESA1). The ESA1 ecosystem is moderately to significantly disturbed but still able to maintain basic functionality.

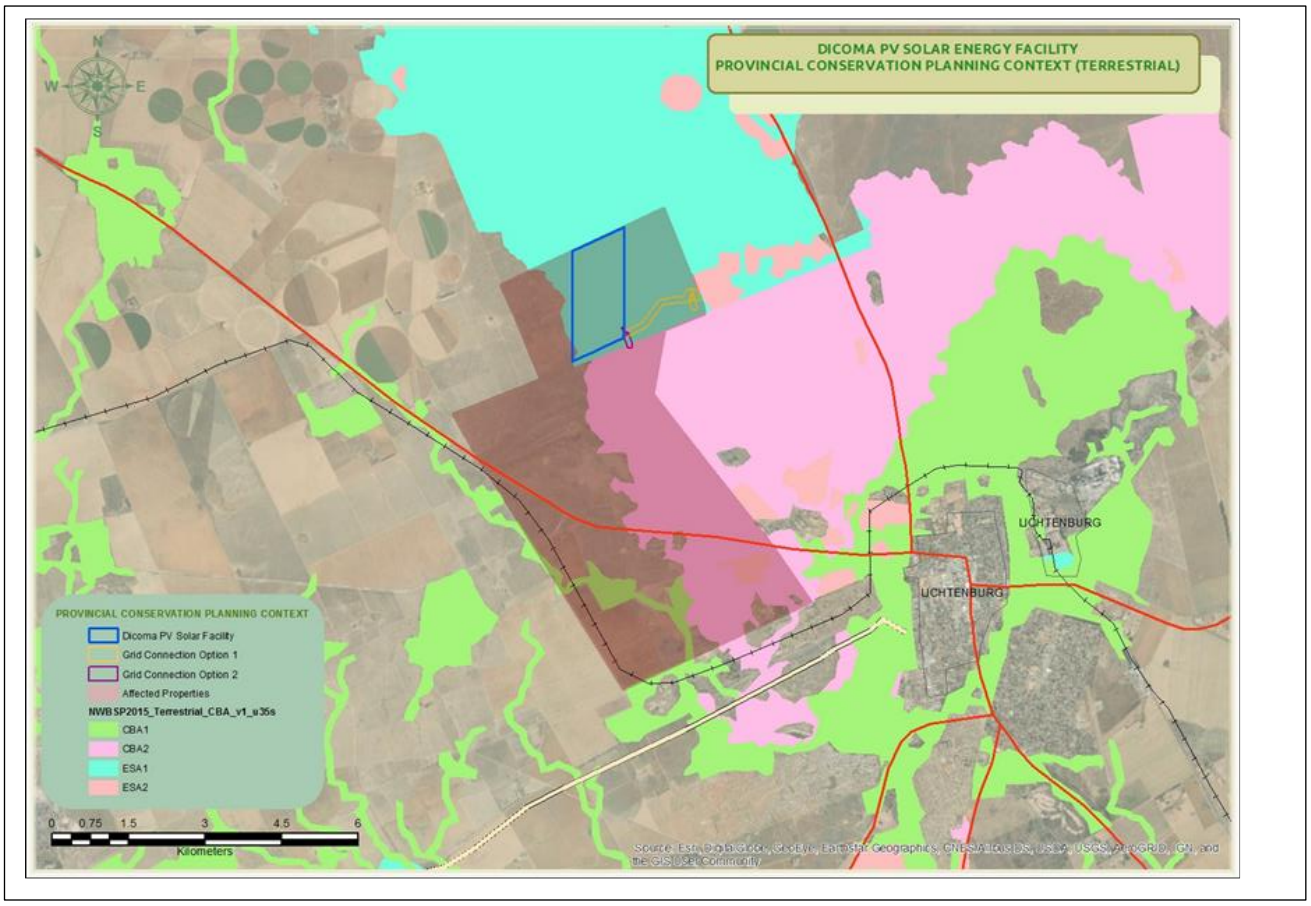

Figure 6.7: Provincial Level Conservation Planning Context – Terrestrial CBA Map (North West Province Biodiversity Conservation Assessment).

vi. Protected and Conservation Areas & NPAEA

According to the PACA database, no Conservation or Protected Areas are located in close proximity to the project site, with the nearest Conservation Area located approximately 67km to the north east of the closest SACA namely Baberspan Nature Reserve. The closest Protected Area (Rall Broers Private Nature Reserve) is located approximately 16km to the north-west of the project site.

Subsequently this development will not have an impact on any SACAs and SAPAs.

According to the NPAES spatial data (Holness, 2010), the entire project site is located well outside of any Focus Areas with the closest Focus Area (NW/Gauteng Bushveld FA) located approximately 25km to the north (**Figure 6.8**). This development will not impact any FAs or impact the future conservation potential of nearby Focus Areas

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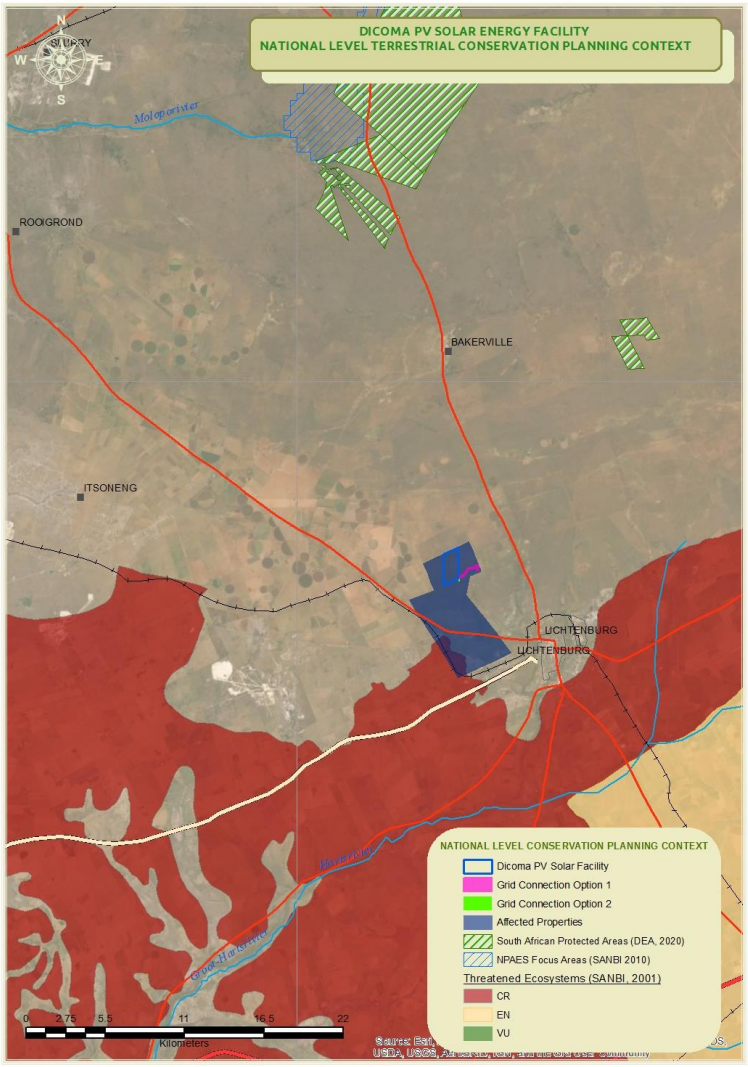

Figure 6.8: National Level Terrestrial Conservation Planning Context

vii. Freshwater Features

The study area is situated within the Lower Vaal Water Management Area (WMA) 10, Quaternary Catchment C31A (Harts River Catchment) and Ecoregion 11.01 (Highveld Ecoregion). The Lower Vaal WMA is located downstream of Bloemhof Dam and upstream of Douglas Weir. It extends to the headwaters of the Harts, Molopo and Kuruman River in the north and the Vaal River Downstream of Bloemhof Dam in the south. It covers a catchment area of 51 543km^2. It lies in the North West and Northern Cape Provinces, with the south-eastern corner in the Free State, and borders on Botswana to the north, as well as on the Crocodile (West) and Marico, Middle Vaal, Upper Orange and Lower Orange water management areas. Major rivers in this WMA include the Molopo, Harts, Dry Harts, Kuruman and Vaal River. As a result of the low rainfall, flat topography and sandy soils occur over much of the WMA, and little usable surface runoff is generated in the WMA.

The study area is situated approximately 7.4 km north west of the Klein Harts River and other tributaries of the Harts River, which forms the most important surface hydrological feature of the region. Generally surface water within the Lichtenburg area is scarce with very few of the watercourses or pans having perennial water.

In terms of the NFEPA (2011) and the NBAs 2018 National Wetlands Map 5 no wetlands or freshwater/watercourse features are located within the project site or within the DWS regulated area of a watercourse or wetland. Following a desktop mapping exercise and a screening site-visit it was confirmed that no freshwater resource features are located within the project site or within close proximity to the site.

6.4.4. Avifauna profile for the area

The development area is located approximately 3km west of the Lichtenburg Game Breeding Centre. This conservation area contains a variety of game species, and the facility used to operate a vulture restaurant which attracts foraging vultures (three species) to the region.

There are no other formal protected areas or any Important Bird and Biodiversity Areas in close proximity to the development area. There are supporting avifaunal habitat within the development area (**Figure 6.9 and Figure 6.10),** and this includes:

- ***Open mixed dolomite grassland with bush clump mosaics:***

It is occupied by a typical grassland bird composition dominated by insectivorous and granivore passerine bird species such as Desert Cisticola, (*Cisticola aridulus*), Eastern Clapper Lark (*Mirafra fasciolata*) (Melodious Lark (*Mirafra cheniana*), Spike-heeled Lark (*Chersomanes albofasciata*), Cape Longclaw (*Macronyx capense*), Ant-eating Chat (*Myrmecocichla formicivora*) and African Pipit (*Anthus cinnamomeus*). Prominent non-passerine species include Orange River Francolin (*Scleroptila gutturalis*), Swainson's Spurfowl (*Pternistis swainsonii*), Northern Black Korhaan (*Afrotis afraoides*), Crowned Lapwing (*Vanellus coronatus*) and Black-winged Kite (*Elanus caeruleus*).

- **Mixed open woodland**

The tall vertical heterogeneity assists with the colonisation of a "Bushveld" bird association consisting of mainly insectivorous passerines. Other noteworthy species include Crested Barbet (*Trachyphonus vaillantii*), Crimson-breasted Shrike (*Laniarius atrococcineus*) and Common Scimitarbill (*Rhinopomastus cyanomelas*).

- **Artificial livestock watering points**

These are represented by artificial water troughs and reservoirs with the purpose to provide drinking water to livestock. However, they act as focal congregation areas for many granivore passerine and non-passerine species, including Cape Sparrow (*Passer melanurus*), Laughing Dove (*Spilopelia senegalensis*), Namaqua dove (*Oena capensis*), Scaly-feathered Weaver (*Sporopipes squamifrons*) and Wattled Starling (*Creatophora cinerea*).

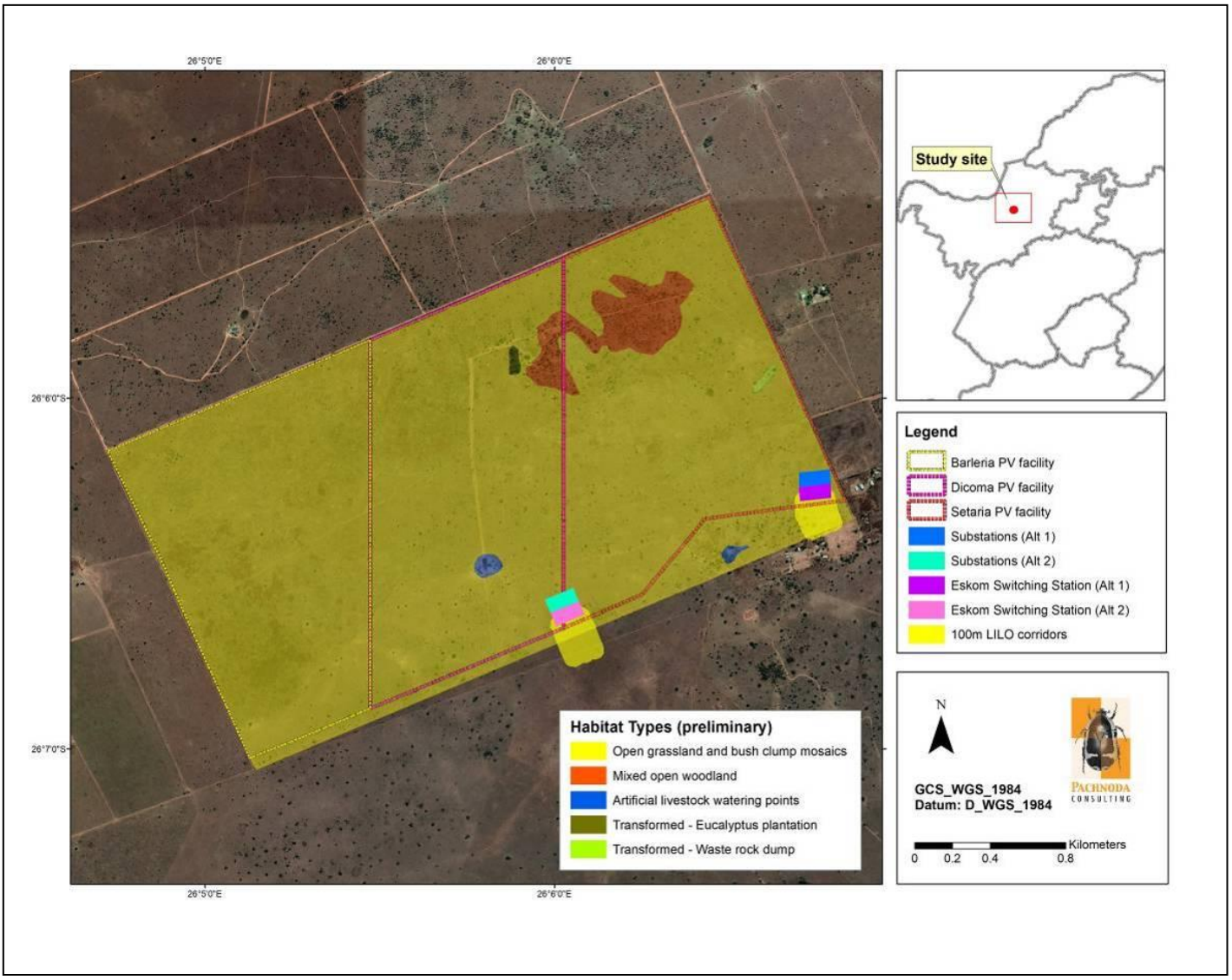

Figure 6.9: A preliminary habitat map illustrating the avifaunal habitat types on the study site

Figure 2.10: A collage of images illustrating examples of avifaunal habitat types (open mixed dolomite grassland and bush clumps mosaic, mixed open woodland and artificial livestock watering points and Eucalyptus) on the study site observed during the austral winter season (August 2021)

i. Avian species richness and predicted summary statistics

Approximately 200 bird species are expected to occur on the study site and immediate surroundings (refer to **Table 6.4**). The expected richness was inferred from the South African Bird Atlas Project (SABAP1 & SABAP2) and the presence of suitable habitat in the study area. The expected richness is also strongly correlated with favourable environmental conditions (e.g. during good rains) and seasonality (e.g. when migratory species are present). This equates to 20% of the approximate 985[28] species listed for the southern African subregion[29] (and approximately 23 % of the 857 species recorded within South Africa[30]). However, the total species richness obtained from the pentad grid 2605_2605 corresponding to the study site contained 176 species, with an average number of 48 species for each full protocol card submitted (for observation of two hours or more). According to personal observations, the average number of species observed on the study site is *ca*. 70 species (obtained during the austral winter season of August 2021).

As indicated in **Table 6.4**, the study site is poorly represented by biome-restricted[31] (refer to **Table 6.5**) and local endemic bird species. It does support *ca*. 30% of the near -endemic species present in the subregion. Prominent wetland features and waterbodies are absent from the study site, thereby explaining the absence and low richness of waterfowl, wading birds and shorebird taxa.

Table 6.4: A summary table of the total number of species, Red listed species (according to Taylor et al., 2015 and the IUCN, 2021), endemics and biome-restricted species (Marnewick et al., 2015) expected (*sensu* SABAP1 and SABAP2) to occur in the study site.

Description	Expected Richness Value
Total number of species	198 (23 %)
Number of Red Listed species*	11 (8 %)
Number of biome-restricted species – Zambezian and Kalahari-Highveld Biomes)	3 (21 %)
Number of local endemics (BirdLife SA, 2018)	2 (5 %)
Number of local near endemics (BirdLife SA, 2018)	7 (23 %)
Number of regional endemics (Hockey *et al.,* 2005)	16 (15 %)
Number of regional near endemics (Hockey *et al.,* 2005)	21 (34 %)

* only species in the geographic boundaries of South Africa (including Lesotho and Swaziland) were considered.
** only species in the geographic boundaries of southern Africa (including Namibia, Botswana, Zimbabwe and Mozambique south of the Zambezi River) were considered
*** Percentage values in brackets refer to totals compared against the South African avifauna (*sensu* BirdLife SA, 2018).

Table 6.5: Expected biome-restricted species (Marnewick *et al*, 2015) likely to occur on the study site.

Species	Kalahari-Highveld	Zambezian	Expected Frequency of occurrence
Kalahari Scrub-robin (*Cercotrichas paena)*	X		Common
White-throated Robin-chat (*Cossypha humeralis*)		X	Common
White-bellied Sunbird (*Cinnyris talatala*)		X	Common

28 *sensu* www.zestforbirds.co.za (Hardaker, 2020)
29 A geographical area south of the Cunene and Zambezi Rivers (includes Namibia, Botswana, Zimbabwe, southern Mozambique, South Africa, Swaziland and Lesotho).
30 With reference to South Africa (including Lesotho and Swaziland (BirdLife South Africa, 2018).
31 A species with a breeding distribution confined to one biome. Many biome-restricted species are also endemic to southern Africa.

ii. Bird species of conservation concern

Table 6.6 provides an overview of bird species of conservation concern that could occur on the study site based on their historical distribution ranges and the presence of suitable habitat. A total of 11 species could occur on the study site which includes six globally threatened species, one globally near threatened species, two regionally threatened species and two regionally near-threatened species.

It is evident from **Table 6.6** that the highest reporting rates (>5%) were observed for the globally endangered Cape Vulture (*Gyps coprotheres*) and the globally critically endangered White-backed Vulture (*Gyps africanus*). These species have a high likelihood of occurrence pending the presence of suitable food (livestock carcasses). The regionally vulnerable Lanner Falcon (*Falco biarmicus*), globally endangered Lappet-faced Vulture (*Torgos tracheliotos*) and globally near threatened Red-footed Falcon (*Falco vespertinus*) show reporting rates between 2% and 5 %. These species have a moderate probability of occurrence and are regarded as occasional foraging visitors to the area.

The remaining species have low reporting rates (<2%) and are regarded as irregular foraging visitors with low probabilities of occurrence. However, during the site survey it was noticed that extensive areas of suitable foraging habitat persist for some of these species (e.g. Secretarybird *Sagittarius serpentarius*) despite being ominously absent from the area. It is possible that the low reporting rates reflect the poor coverage of the study area by citizen scientists (e.g., birdwatchers), and some of these species could occur in higher numbers due to being overlooked. As an example, Red-footed Falcons (*F. vespertinus*) often occur in flocks of the similar-looking Amur Falcon (*F. amurensis*), which based on reporting rates appear to be a common summer visitor to the area. Therefore, it is highly possible that Red-footed Falcons were previously overlooked or misidentified.

Both White-backed Vulture (*Gyps africanus*) and Lappet-faced Vulture (*Torgos tracheliotos*) were confirmed feeding on a calf carcass during the July 2018 austral winter site survey. In addition, two Cape Vultures (*G. coprotheres*) were also confirmed soaring overhead during the July 2018 austral winter site survey.

Table 6.6: Bird species of conservation concern that could utilise the study site based on their historical distribution range and the presence of suitable habitat. Red list categories according to the IUCN (2021) and Taylor et al. (2015).

Species	Global Conservation Status*	National Conservation Status**	Mean Reporting rate: SABAP1 (n=142)	Mean Reporting rate: SABAP2 (n=64)	Preferred Habitat	Potential Likelihood of Occurrence
Anthropoides paradiseus (Blue Crane)	Vulnerable	Near threatened	47.18	-	Prefers open grasslands. Also forages in wetlands, pastures and agricultural land.	Potential vagrant or highly irregular foraging visitor.
***Aquila rapax* (Tawny Eagle)**	**Endangered-**	**Endangered**	**2.11**	**-**	**Lowveld and Kalahari savannas, especially game farming areas and reserves**	**An irregular visitor or vagrant to the study site.**

Species	Global Conservation Status*	National Conservation Status**	Mean Reporting rate: SABAP1 (n=142)	Mean Reporting rate: SABAP2 (n=64)	Preferred Habitat	Potential Likelihood of Occurrence
Ciconia abdimii (Abdim's Stork)	-	Near threatened	7.75	-	Open stunted grassland, fallow land and agricultural fields.	An uncommon summer foraging visitor to areas consisting of secondary grassland or arable land.
Falco vespertinus (Red-footed Falcon)	Near threatened	Near threatened	2.11	3.13	Varied, prefers to hunt open arid grassland and savannoid woodland, often in company with Amur Falcons (*F. amurensis*).	An occasional summer foraging visitor to the area.
***Falco biarmicus* (Lanner Falcon)**	**-**	**Vulnerable**	**2.82**	**9.1 (for pentad 2605_2605)**	**Varied, but prefers to breed in mountainous areas.**	**An occasional foraging visitor to the study area.**
Gyps coprotheres (Cape Vulture)	Endangered	Endangered	17.16	9.1 (for pentad 2605_2605)	Mainly confined to mountain ranges, especially near breeding site. Ventures far afield in search of food.	A regular foraging/scavenging visitor to the study site pending the presence of food (e.g. livestock carcasses).
Gyps africanus (White-backed Vulture)	Critically Endangered	Critically Endangered	16.18	4.5 (for pentad 2605_2605)	Breed on tall, flat-topped trees. Mainly restricted to large rural or game farming areas.	A regular foraging/scavenging visitor to the study site pending the presence of food (e.g. livestock carcasses).
Leptoptilos crumeniferus (Marabou Stork	-	Near threatened	0.70	1.56	Varied, from savanna to wetlands, pans and floodplains – dependant of game farming areas	An irregular scavenging visitor to the area.
Polemaetus bellicosus (Martial Eagle)	Endangered	Endangered	-	4.5 (for pentad 2605_2605)	Varied, from open karroid shrub to lowland savanna.	An irregular foraging visitor. It was last recorded from pentad 2605_2605 south of the study site on 28 Jan 2012.

Species	Global Conservation Status*	National Conservation Status**	Mean Reporting rate: SABAP1 (n=142)	Mean Reporting rate: SABAP2 (n=64)	Preferred Habitat	Potential Likelihood of Occurrence
Sagittarius serpentarius (Secretarybird)	Endangered	Vulnerable	2.45	1.56	Prefers open grassland or lightly wooded habitat.	**Regarded as an irregular foraging visitor to the study site despite the widespread presence of suitable foraging habitat.**
Torgos tracheliotos (Lapped-faced Vulture)	Endangered	Endangered	5.63	4.69	Lowveld and Kalahari savanna; mainly on game farms and reserves	**A regular foraging/scavenging visitor to the study site pending the presence of food (e.g. livestock carcasses).**

6.5. Integrated Heritage including Archaeology, Palaeontology and the Cultural Landscape

6.5.1. Historical, Archaeological and Built Environment Heritage

Lichtenburg town was established in 1873 and named "Town of Light". General Del la Rey was buried in Lichtenburg after a fatal shooting incident at Langlaagte. During the 1800's, more and more farmers settled in the area. During the Second Boer War, the strategically important town of Lichtenburg was occupied by both Boer and Briton for short spells. In November 1900, a large British force under Col. Robert Baden-Powell was transferred to Lichtenburg and secured the town, and much of the territory with it. In 1926, Lichtenburg experienced a gold rush that lasted approximately 10 years. Lichtenburg district is now mostly a farming area, combining cattle and crop-farming and large areas of former diamond mine diggings are now used as grazing.

According to van Schalkwyk et al (1995, SAHRIS NID 6237) in their report completed for the Bakerville Diamond Fields, "land use in the area goes back to the Early Stone Age, as can be determined by the number of stone artifacts found near the old mining commissioner's office. This material seems to be disturbed from its primary context because of the mining activities. It is postulated that similar occurrences will be found in other parts of the diggings, but that this material would have been disturbed out of context." As a result of the dominant land use in the area, many of the heritage resources identified by van Schalkwyk et al (1995) are associated with past and present agriculture, and consist of farming implements, a few windmills, and dipping-troughs. One such trough, located at Elandsputte on the farm Uitgevonden 355JP, was the site where the first diamond was discovered. This structure is a proclaimed national monument (now Provincial Heritage Site). Van Schalkwyk et al (1995) identified a number of burial grounds within their surveyed area. Heritage resources known from this area include burial grounds and graves, archaeological artefacts and old structures, often associated with farming activities or diamond mining.

The study area was previously assessed by Van der Walt (2014) where it was noted that most of the Stone Age archaeology in the study area consists of low densities of scattered (and possibly mixed) MSA and LSA artefacts. These find spots are documented as "occurrences" and are of low significance but more

substantial and higher density scatters of MSA material do occur and were recorded as "sites". The archaeological sites are described as "Medium density scatters of tools, blades, flakes, cores, MSA mainly of chert. " and are graded IIIC i.e. low local significance. Van der Walt (2014) also identified a single unmarked grave (approximately 27 years old) and farm labour housing dating to the 1990's. He further noted that "Cultural landscape elements were noted in the northern portion of the study area consisting of the mentioned farm labourer dwelling together with a windmill, stone walled cattle kraal and a recently constructed kraal." (Van der Walt, 2014).

6.5.2. Palaeontology

Bamford (2018) noted that the study site is in the Malmani Subgroup which contains a number of stromatolitic dolomites. These were formed in warm shallow sea and are the accumulation of layer upon layer of minerals deposited by blue-green algae (also known as cyanobacteria) and rarely some filamentous algae. Minerals deposited by the algae include calcium carbonate, calcium sulphate and magnesium carbonate. Very rarely are the algal cells preserved in the stromatolites and these are microscopic. Stromatolites are essentially trace fossils and these ones are 2750 to 2650 million years old and very abundant. Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are much too old to contain fossils other than blue-green algae

6.6 Visual Quality

The visual quality of the project site and the broader study area is defined by the following characteristics:

- The project site is in an area that has a distinct rural and agricultural character, with some mining/quarrying activity located south-east of the proposed development site at a distance of 5km at the closest.
- The dominating terrain morphology of the study area is described as Plains and Pans or Slightly Undulating Plains of the Central Interior Plain. The slope of the entire study area is extremely even (flat) with a very gradual drop (from the northern section of the study area to the Die Vlei River which flows through Lichtenburg.
- Maize farming (both dryland and irrigated agriculture), with some mining/quarrying activity dominates the land use character in the south-west part of the study area.
- A great number of power lines, associated with this substation, are located south and east of the site.

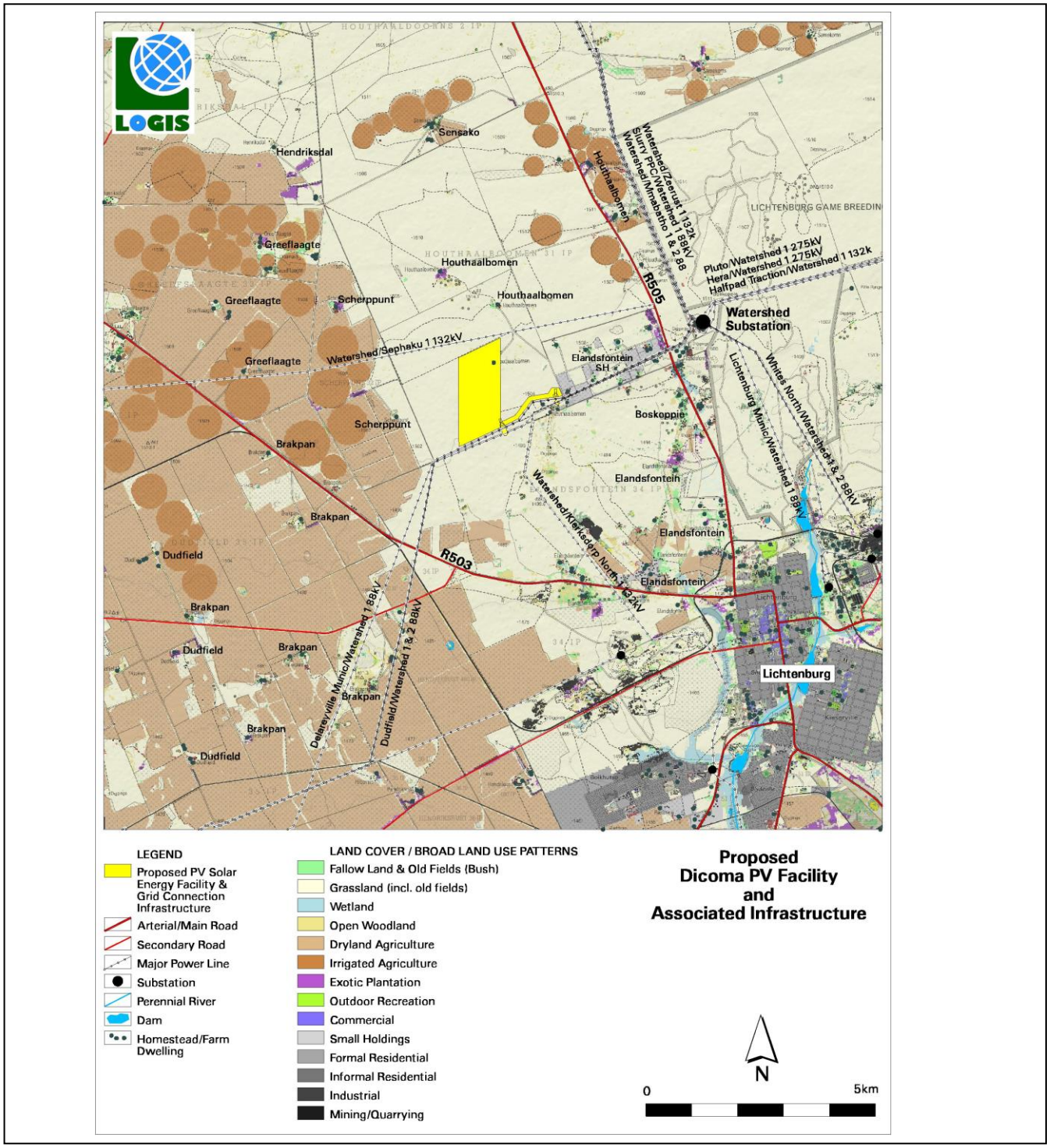

Figure 6.11. Land cover and broad land use patterns of the proposed Dicoma PV facility.

6.7 Social Context

Table 6.7 provides a baseline summary of the socio-economic profile of the Ditsobotla Local Municipality within which Dicoma PV is proposed. The data presented in this section have been derived from the 2011 Census, the North West Provincial Spatial Development Framework (PSDF), and the Ngaka Modiri Molema District Municipality and Ditsobotla Local Municipality IDPs.

Table 6.7: Baseline description of the socio-economic characteristics of the area proposed for Dicoma PV

Location characteristics
» The project is proposed within the North West Province, the province located to the west of the major population centre of Gauteng Province.
» The project is proposed within the Ditsobotla LM of the Ngaka Modiri Molema DM.
» The Ditsobotla LM is approximately 6 398.7km² in extent.
Population characteristics
» Ditsobotla LM has a population of 181 866 which is about one-fifth of the figure in Ngaka Modiri Molema 889,108.
» The LM occupies an area of land approximately 6 465km² in extent and has a population density of 26/7km².
» Between 2001 and 2011 the LM experience a positive population growth of 1.3% per year. This is higher than the DM population growth of 1.0% between 2001 and 2011.
» According to Census 2011, the significant majority of 89.1% of the Ditsobotla LM population are Black African, followed secondly by 8.2% which are White, 1.9% which are Coloured, and 0.6% which are Indian / Asian. This population structure corresponds to that of the Ngaka Modiri Molema DM, and North West Province.
» The Ditsobotla LM is slightly male dominated with males making up just over half (50.5%) of the municipal population, and females the remaining 49.5% of the population. This correlates with the Provincial population which is also slightly female dominated (comprising 50.7% males, and 49.3% females), but differs from the District and National populations which are both females dominated.
» When assessing five-year age groups the largest proportion of the population are between the ages of 0 to 4 years old, with the proportion decreasing uniformly as age increases. There are no significant outliers within any one age group. The age structure of the North West Province and South African national populations are similar to one another, but differ somewhat from that of the Ditsobotla LM and Ngaka Modiri Molema DM.
» The dependent portion of the population typically comprises youth below 15 years of age which are yet to enter the workforce, and individuals 65 years and older which would typically already have retired from the workforce.
» The Ditsobotla LM has a dependency ratio of 38.1; implying that for every 100 people within the Ditsobotla LM, over two thirds (i.e. 38.1) of them are considered dependent. This figure is slightly lower than the Ngaka Modiri Molema DM (39.2), but higher than the provincial (35.3) and national (34.5) dependency ratios
Economic, education and household characteristics
» Approximately 14.7% of the Ditsobotla LM population aged 20 years and older have received no formal form of schooling.
» The majority of 29.9% of the LM population have received some secondary education (which correlates with the DM, Provincial, and national averages), followed closely by 22.6% which have received some primary schooling. Approximately one fifth (20%) of the LM population have completed Grade 12 / Matric, with 6.8% having received some form of higher / tertiary education.
» Due to the fact that the majority of almost three quarters (73.2%) of the Ditsobotla LM population have not completed Grade 12 / Matric, it can be expected that a large proportion of the population will either be unskilled or have a low-skill level, and would therefore either require employment in non-skilled or low-skilled sectors; or alternatively would require skills development opportunities in order to improve the skills, and income levels of the area
» The Ditsobotla LM has an unemployment rate of 28.3%.
» Of the Ditsobotla LM's labour force (i.e. individuals ages between 15 and 64 years of age) the majority of 43.2% are not economically active.
» The economically inactive proportion of the Ditsobotla LM's labour force is slightly lower than the DM (47.9%), but higher than the Provincial (40.2%), and national (39.2%) averages.
» Approximately 14.3% of the Ditsobotla LM's labour force is unemployed.
» The unemployment rate for the LM is fractionally lower than the DM (14.8%), as well as the Provincial (17.1%), and national averages (16.5%).
» Over two thirds (68.4%) of households within the Ditsobotla LM fall within the low income (poverty level) bracket (i.e. below R38 400 per annum).

- Approximately one quarter (25.9%) of households within the LM fall within the medium income bracket, while the remaining 5.7% fall within the high income bracket.
- According to the Ditsobotla LM IDP 2017 – 2018 the LM contributes 22.7% to the DM economy.
- The finance and business services sector represent the largest contributing sector with a contribution of 24.7%, followed by the trade sector with a contribution of 19.1%, the manufacturing sector which contributes 11.8%, and the general government service which contributes 11.4%.
- The dominant economic sectors within the LM include finance and business services (25%); wholesale and retail trade, catering and accommodation (19%); manufacturing (12.2%); and general government services (11.5%).

Services

- Approximately two thirds (66%) of households within the Ditsobotla LM have access to piped water inside their yard / dwelling which is equivalent to the basic level of service provision.
- Approximately 23.2% of households receive piped water outside of their yard, while 10.9% have no access to water services
- The majority of 34.8% of the Ditsobotla LM households make use of the bucket system, followed by 33.7% which have access to and make use of flush or chemical toilets
- A quarter (25%) of households within the LM have access to pit latrines, and 6.5% of households have no access to sanitation services
- Approximately 32 933 (74%) of households within the LM are connected to the electricity grid. The LM has a total backlog of 11 567 (26%) of households without access to electricity.

6.7.1 Settlement and infrastructure

Farm settlements or residences occur at irregular intervals throughout the project site. Some of these, in close proximity to the proposed development site, include: *Houthaalbomen, Boskoppie, Elandsfontein, Brakpan, Scherppunt, Greeflaagte*, etc. The Elandsfontein small holdings are located east of the identified development area.

CHAPTER 7: SCOPING OF POTENTIAL ISSUES

This Chapter provides an overview of the potential impacts and risks associated with the Dicoma PV, including the BESS and associated infrastructure, as identified at this stage of the process through a specialist studies.

Potential environmental impacts and risks associated with the development of PV solar energy generation facilities, as described in the IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015), include:

- Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and Occupational Health and Safety (OHS) issues such as the risk of preventable accidents leading to injuries and/or fatalities.
- Land matters, such as land acquisition procedures and in particular involuntary land acquisition/resettlement.
- Landscape and visual impacts, such as the visibility of the project within the wider landscape and associated impacts on landscape designations, character types and surrounding communities.
- Ecology and natural resources, such as habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species.
- Cultural heritage, such as impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction.
- Transport and access, such as impacts associated with the transportation of materials and personnel on project-affected communities.
- Water usage, such as the cumulative water use requirements in arid areas where local communities rely on scarce groundwater resources.

This chapter serves to describe and evaluate the identified potential environmental impacts relevant and specific with the construction and operation phases of the 75MW Dicoma PV facility, and to make recommendations for further studies required to be undertaken in the EIA phase.

The project site considered for the Dicoma PV facility includes Portion 1 of the Farm Houthaalboomen 31, Portion 9 of the Farm Houthaalboomen 31 and Portion 10 of the Farm Houthaalboomen 31, an area of approximately 552ha in extent. This this project site, a development area of approximately 176ha has been investigated during this Scoping Phase to determine the environmental suitability of the site. The study will provide an indication of the areas of sensitivity that the developer would need to take into consideration in the planning of the layout of the Dicoma PV facility within the development area.

The majority of the environmental impacts are expected to occur during the construction phase. Environmental issues associated with construction and decommissioning activities of the PV facility and associated infrastructure are similar and include, among others:

- Impact on ecology, including flora and fauna.
- Impact on avifauna.
- Impact on soils, geology, agricultural potential and land use.
- Impact on heritage resources (including archaeology and palaeontology).
- Social impacts (positive and negative).
- Visual impacts.

Environmental issues specific to the operation of the PV facility and associated infrastructure could include, among others:

» Long-term loss of protected species (flora, fauna, avifauna) or conservation-worthy habitats.
» Change in land-use for the footprint of the facility.
» Visual impacts (negative viewer perceptions and visibility of the facility).
» Social impacts (positive and negative).

In order to appropriately identify, assess and, as far as possible, avoid or mitigate potential impacts and risks that may be associated with the development, construction, operation and decommissioning of Dicoma PV, Savannah Environmental commissioned a team of independent specialists with relevant scientific knowledge and expertise in the biophysical (i.e. biotic and abiotic) and socio-economic environments. Copies of the specialists' Scoping level assessments are included in **Appendices D – I** of this Scoping Report.

Section 7.3 provides the findings of the scoping study undertaken for the construction and operation phases of Dicoma PV. Those impacts associated with construction can also be expected to be associated with the decommissioning phase (however, to a lesser extent as the project site would have previously undergone transformation and disturbance during construction). The findings must be read in conjunction with the specialist reports attached as **Appendices D – I** of this Scoping Report. Potential impacts associated with the project are evaluated, and recommendations are made regarding further studies required within the EIA Phase.

A summary of the potential cumulative impacts that may be associated with the project are provided in **Section** Error! Reference source not found.. These impacts are associated with the scale of the project when considered together with other similar developments within the region and will be confirmed and assessed within the EIA Phase of the project.

7.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter identifies the potential environmental impacts associated with the development of Dicoma PV. This chapter includes the following information required in terms of the EIA Regulations, 2014 - Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified 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 impacts and risks identified to be associated with the construction and operation phase of Dicoma PV have been included in **Section 7.3.** Impact tables have been included for each field of study which considers the nature, significance, consequence, extent, duration and probability of the impacts, as well the reversibility of the impacts, the loss of resources and avoidance, management or mitigation.
(g)(vii) 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	The positive and negative impacts associated with Dicoma PV have been included in **Section 7.3.**

Requirement	Relevant Section
geographical, physical, biological, social, economic, heritage and cultural aspects.	
(g)(viii) the possible mitigation measures that could be applied and level of residual risk	Possible mitigation (specifically relating to the avoidance of sensitive areas) has been included in **Section 7.3.**

7.2 Assumptions made during the Evaluation of Potential Impacts

While evaluating potential impacts associated with the proposed project, the Scoping evaluation assumed the following:

- All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
- It is assumed that the development area for the solar PV facility identified by the developer represents a technically suitable site for the establishment of Dicoma PV which is based on the design undertaken by technical consultants for the project.
- The development footprint (the area that will be affected during the operation phase) will include the footprint for the PV facility and associated infrastructure (i.e. internal access roads, BESS and grid connection infrastructure).
- The Scoping Phase evaluation of impacts has been largely based on desktop studies and available data within the proposed area. This information has been used to inform this Scoping report and will be verified by specialists in the EIA phase to assess the project development footprint for Dicoma PV.

7.3 Evaluation of Potential Impacts associated with the Construction Phase, Operation and Decommissioning phases

7.3.1 Impacts on ecology (including flora and fauna)

The Dicoma PV development area falls within the planning domain of the North West Province Biodiversity Conservation Assessment which maps Terrestrial and Aquatic Critical Biodiversity Areas and Ecological Support Areas within the Province. During the site survey four provincially protected plant species were confirmed (*Hypoxis hemerocallidea, Boophone disticha, Schizocarphus nervosus* and *Delosperma floribundum*), and a few *Vachelia erioloba* (Camel Thorn, a nationally protected tree) were also confirmed.

The most significant potential impact of any PV facility is on all faunal communities is the displacement or exclusion of threatened, rare, endemic or range-restricted species due to habitat loss brought about by habitat destruction and disturbance during the construction and operational phases of the facility. The infrastructure associated with PV facility (including the access roads, laydown areas, on-site substation and power line) also impact on faunal habitat loss through destruction and disturbance during construction and maintenance of substations, servitudes and roadways.

Sensitivity Analysis of the Site

An ecological sensitivity map has been compiled using existing information for the province, including Critical Biodiversity Areas and Wetlands (as per the National Biodiversity Assessment Wetland Map 5), as well as available Geo-spatial information **Figure 7.1**). This ecological sensitivity map is preliminary in nature and will be revised during in the EIA phase as required. The following preliminary sensitivities were identified:

» **Medium Sensitivity**

Natural to Near-natural Open Savanna Grassland: All natural, intact grassland areas that is classified as ESA1. The vegetation of these grasslands provides soil stability, are valuable grazing, increase infiltration of precipitation and contribute to the maintenance of pollinator populations within the area. These grasslands may potentially be suitable for the presence of SCC (fauna and flora).

» **Medium-Low Sensitivity**

Re-established grassland on historical cultivated areas: These are historically transformed areas located within the ESA1 and which are now covered by a stable plagio-climax grassland (mostly indigenous gras and forb species). Re-establishment of mostly indigenous vegetation have been allowed to such an extent that the vegetation can now provide most of the functions and services associated with a natural grassland. These areas are also potential suitable habitat for some SCC (Flora and Fauna).

» **Low Sensitivity**

All transformed and disturbed area: This includes access roads and disturbed road shoulders, farm roads, fire breaks, trampled and overgrazed grasslands, recently cultivated areas, homesteads, woodlots etc.

The site does not intersect with the 500m regulated area from any freshwater feature in the broader area, and as such any further investigation/assessments will not be necessary (during the EIA phase). Subsequently the focus of the EIA Phase Ecological and Biodiversity Assessment will be on all terrestrial features.

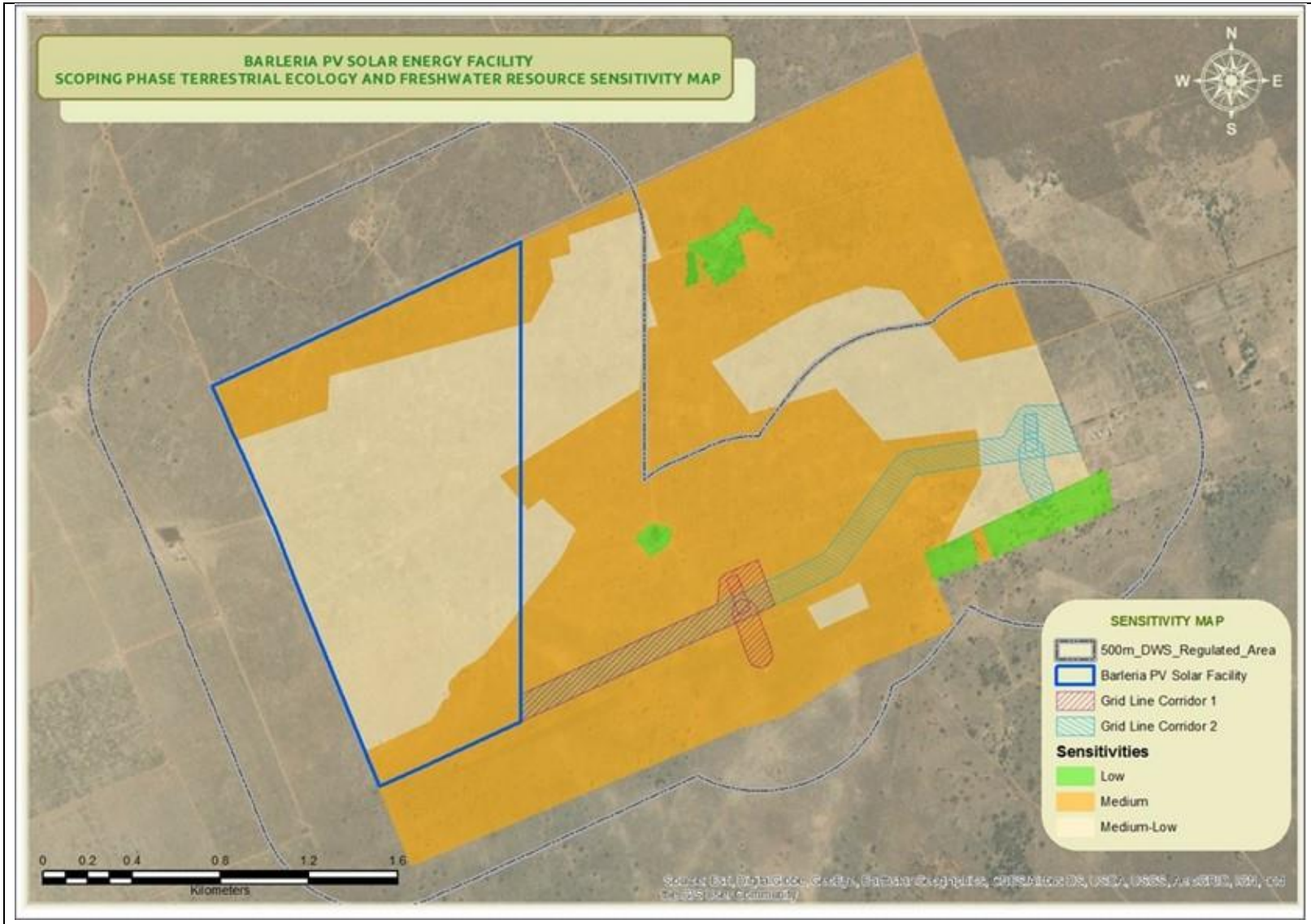

Figure 7.1. Preliminary ecological sensitivity map of the full extent of the Dicoma PV development area

Overview of the most significant impacts of the proposed facility

- Migration routes of fauna may be impacted, which could have an effect population dynamics and long-term persistence. This can be mitigated but requires planning to maintaining migration routes.
- For the construction of the solar panels, the affected area is largely cleared of vegetation prior to construction.
- Destruction and disturbance of the fauna and avifauna as an area of approximately 176ha will be required for the facility (the development footprint will be confirmed in the EIA Phase following layout design).

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance to and loss of indigenous natural vegetation.	Construction of infrastructure will lead to direct loss of vegetation, causing a localised or more extensive reduction in the overall extent of vegetation. Consequences of the clearing and loss of indigenous natural vegetation occurring may include: » Increased vulnerability of remaining vegetation to future disturbance, including extreme climatic events » General loss of habitat for sensitive fauna and flora species » Loss in variation within sensitive habitats due to loss of portions. » General reduction in biodiversity » Increased fragmentation (depending on location of impact) and associated reduced viability of species populations » Alteration of the habitat suitable for plant populations by altering surface structure. This will change species composition and associated species interactions » Disturbance to processes maintaining biodiversity and ecosystem goods and services » Loss of ecosystem goods and services	Local	None identified at this stage.
Disturbance or loss of threatened/ protected plants	SCC could potentially occur in the study area. Flora is affected by an overall loss or alteration of habitat and due to its limited ability to extend or change its distribution range. In the case of SCC, a loss of a population or individuals could lead to a direct change in the conservation status of the species, possibly extinction. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations. Consequences of this may include: » Fragmentation and decline of populations of affected species; » Reduction in the area of occupancy of affected species;	Local	None identified at this stage.

	» Loss of genetic variation within affected species; » Alteration of the habitat suitable for plant associations by altering of the surface structure. This will change species composition and associated species interactions and species ability to persist; and » Future extinction debt of particular species of flora and fauna. These may all lead to a negative change in conservation status of the affected species, which implies a reduction in the chance of survival of the species.		
Loss of habitat for fauna species of conservation concern.	Fauna species of conservation concern are indirectly affected primarily by a loss of or alteration of habitat and associated resources. Animals are mobile and, in most cases, can move away from a potential threat, unless they are bound to a specific habitat that is also spatially limited and will be negatively impacted by a development. Nevertheless, the proposed development will reduce the extent of habitat available to fauna. For any species, a loss of individuals or localised populations is unlikely to lead to a change in the conservation status of the species. However, in the case of threatened animal species, loss of a suitable habitat, population, or individuals could lead to a direct change in the conservation status of the species. This may arise if the proposed infrastructure is located where it will impact on such individuals or populations or the habitat that they depend on. Consequences may include: » Loss of populations of affected species; » Reduction in area of occupancy of affected species; » Loss of genetic variation within affected species; and » Future extinction debt of a particular species. During the site survey, no mammal SCC were confirmed within the project site. There are however a number of red data species that have been recorded for the wider area within which the study area is located. Their presence and the necessity to keep their habitats intact in the study area needs to be confirmed during a field survey in the EIA phase.	Local	None identified at this stage.

Disturbance to migration routes and associated impacts to species populations.	Site preparation and construction activities may interfere with the current migration routes of fauna species. This may lead to: » Reduced ability of species to move between breeding and foraging grounds, reducing breeding success rates; » Reduced genetic variation due to reduced interaction amongst individuals or populations as a result of fragmentation effects caused by the proposed developments	Site and surroundings	None identified at this stage.
Impact on Critical Biodiversity Areas.	Development within the ESA1 may negatively impact biodiversity and the ecological functioning of the ESA.	Local and Regional	None identified at this stage.
Establishment and spread of declared weeds and alien invader plants.	Major factors contributing to invasion by alien invader plants include excessive disturbance to vegetation, creating a window of opportunity for the establishment of alien invasive species. In addition, regenerative material of alien invasive species may be introduced to the site by machinery traversing through areas with such plants or materials that may contain regenerative materials of such species. Consequences of the establishment and spread of invasive plants include: » Loss of indigenous vegetation; » Change in vegetation structure leading to change in or loss of various habitat characteristics; » Change in plant species composition; » Altered and reduced food resources for fauna; » Change in soil chemical properties; » Loss or disturbance to individuals of rare, endangered, endemic and/or protected species; » Fragmentation of sensitive habitats; » Change in flammability of vegetation, depending on alien species; » Hydrological impacts due to increased transpiration and runoff; » Increased production and associated dispersal potential of alien invasive plants, especially to lower-lying wetland areas, and » Impairment of wetland function.	Local and Regional	None identified at this stage.
Altered runoff patterns due to rainfall	The PV panels create large surfaces of rainfall interception, where rainfall is collected and concentrated at the edges from where it then moves onto the	Site and surroundings	None identified at this stage.

interception by PV panels and compacted areas.	ground in larger, concentrated quantities as opposed to small drops being directly intercepted and raindrop impact dispersed by vegetation, then absorbed by the ground. This may lead to a localised increase in runoff during rainfall events, which may result in localised accelerated erosion. Likewise, access roads and areas where soils have been compacted during construction will have a low rainfall infiltration rate, hence creating more localised runoff from those surfaces. Runoff will thus have to be monitored and channelled where necessary to prevent erosion over larger areas.		
Impacts on freshwater features	The site does not intersect with the 500m regulated area from any freshwater feature in the broader area, and as such there is no impact as no features are present.	There is no impact	None identified at this stage.
Description of expected significance of impact Impacts on ecology and species of conservation concern are likely to be of moderate significance, depending on the exact location of the development footprint. The project site provides sufficient area for the development of the project within areas which are not considered to be of significant ecological sensitivity. Where the facility layout is able to avoid areas of sensitivity, the impact of the development on ESAs and broad-scale processes is likely to be relatively low and of low overall significance. There are no freshwater features on the site and therefore there will be no impact.			
Gaps in knowledge & recommendations for further study » The initial desk-top investigation of the study area indicates that a few protected and red-data species as well as sensitive habitats potentially occur on the site. However, once the final layout has been designed in accordance to findings of a field investigation, the likelihood that the development will compromise the survival of any species of conservation concern is expected to be limited. » Plant species of conservation concern will only be identifiable during the growing season; therefore the field survey of vegetation should be undertaken between November and be completed by April. » Although previous collection records from the area exist, the study area itself may not have been previously surveyed and there may be additional species that have not yet been captured in the existing species databases for the area. A detailed ecological survey and sensitivity assessment will be undertaken during the EIA phase.			

7.3.2 Impacts on avifauna

Bird distribution patterns fluctuate widely in response to environmental conditions (e.g. local rainfall patterns, nomadism, migration patterns, seasonality), meaning that a composition noted at a particular moment in time will differ during another time period at the same locality. For this reason, a dry season and wet season bird monitoring survey are being conducted in line with Regime 2 for Dicoma PV. The dry season survey was conducted in August 2021. The result from the wet season bird monitoring will be used to inform both the development footprint as well as Avifauna Impact Assessment report, to be completed for the EIA Report.

The potential impacts to avifauna from construction and/or operation activities include:

» The displacement of nationally important species from their habitats,
» Loss of habitats for such species,
» Disturbance during construction, and operation, including the potential for collision with infrastructure.

Sensitivity Analysis of the Site

An avifaunal sensitivity map has been compiled using existing information and no areas of high sensitivity have been identified at this stage (**Figure 7.2**). This avifauna sensitivity map is preliminary in nature and will be revised during in the EIA phase as required.

Open mixed woodland, artificial livestock watering points, open grassland and bush clump mosaics habitat units have been observed on the project site. The following preliminary avifauna sensitivities have been identified:

» **Medium Avifauna Sensitivity**

- The mixed woodland was observed to be used as roosting platforms for vultures (observed during the dry season survey in August 2021) and supported areas where a higher number of bird species are anticipated to occur.
- The artificial livestock watering points attracted large numbers of granivore passerine and non-passerine bird species, of which many need to drink water on a daily basis. These watering points do create a micro habitat; however, they are artificial origin, but that this is not considered high sensitivity as the artificial system can/will be relocated to other areas outside of the developement area, and the water source will change.
- The extensive open grassland and bush clump mosaics provide potential suitable foraging habitat for some collision-prone bird species, including the Northern Black Korhaan (*Afrotis afraoides*). Threatened and near threatened bird species are anticipated to be relatively low, there by suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat is natural. In addition, the open grassland and bush clump mosaics are widespread in the region.

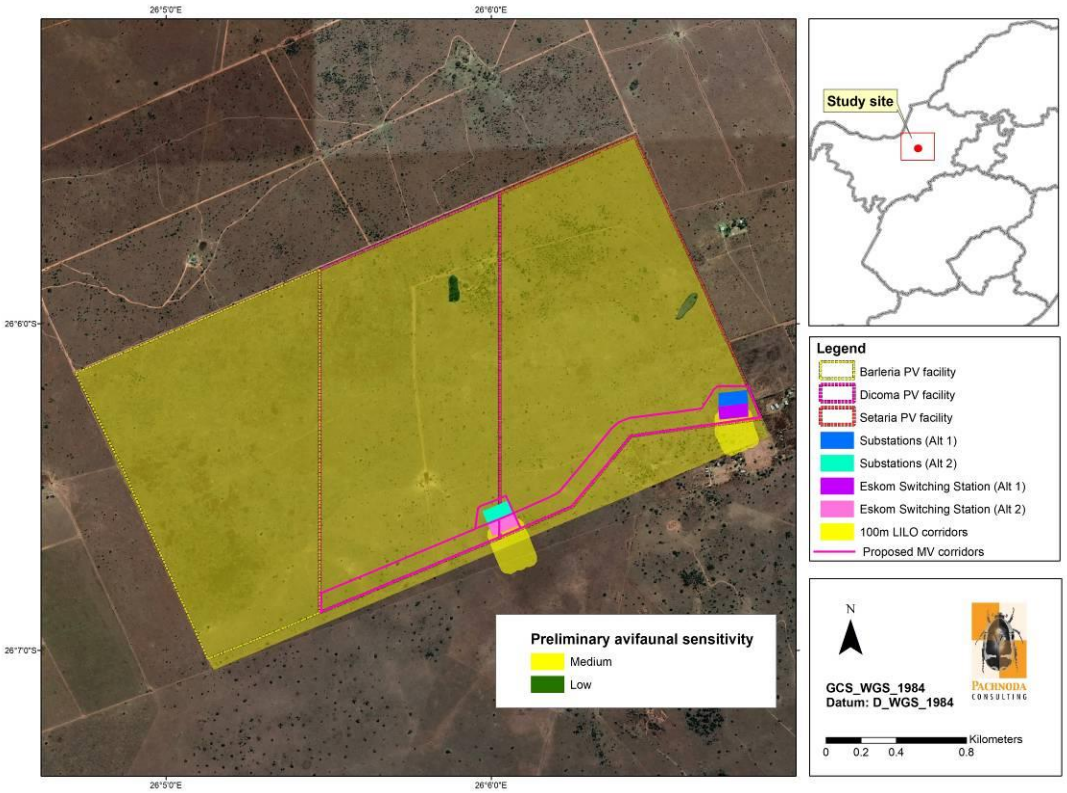

Figure 7.2. Preliminary avifauna sensitivity map of the full extent of the Dicoma PV development area

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Loss of intact habitat and subsequent displacement of bird species due to the footprint required for transformation for the facility and associated infrastructure.	Vegetation clearing will potentially lead to the loss of avifaunal species, habitats and ecosystems as birds are displaced from their habitat.	Local	None identified at this stage
Mortality of avifauna from collisions with plant infrastructure including overhead	Mortality among the local avifauna may result due to direct collisions with solar panels, making use the facility	Local	None identified at this stage

power lines and/or disturbance of avifauna due to general operation activities.	infrastructure for nesting sites, or entrapment along the fenced boundaries of the facility.		

Description of expected significance of impact

Since habitat loss is an unavoidable outcome of the development, this impact cannot be fully mitigated and the impacts on the local avifauna after mitigation are likely to be low negative for Dicoma PV, but cumulative significance could be higher. Impacts restricted to the construction period, such as noise, are likely to be of low significance. With mitigation, the impact of the facility during operation on avifauna due to nesting, collision and other interaction is expected to be of low significance.

Gaps in knowledge & recommendations for further study

- The density and distribution of protected species of conservation concern across the project site will need to be characterised and quantified within the proposed development footprint to better inform the EIA Phase and the final sensitivity map.
- The design and position of the development footprint and facility should consider potential impacts on avifauna.

7.3.3 Impacts on Soils, Geology, Agricultural Potential and Land-Use

The proposed Dicoma PV have medium sensitivity to the proposed development and currently used for livestock grazing. The available grazing consists of natural veld and there are no planted pastures and no grass harvesting and baling. The grazing capacity of the development area is 8ha/LSU. The development area therefore has the capacity to feed 22 head of cattle. The shallow rocky nature of the soils within the area limits the potential for rainfed crop production. These soils may be suitable for irrigated farming, but no irrigation infrastructure is present on the properties. There are no freshwater resources on the site, and therefore a reliable source of groundwater would be required to be used for irrigation.

The following have been identified as potential impacts on agricultural resources and productivity, the significance of which will be determined during the EIA Phase. All these impacts are local in extent, confined to the site.

- Loss of areas where livestock can be produced
- Soil compaction due to construction vehicles traversing on site.
- Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard standing surfaces and roads. Erosion will cause loss and deterioration of soil resources.
- Loss of soil fertility through disturbance of in situ horizon organisation.
- Soil chemical pollution due to oils and fuel spillages on site

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Loss of areas where livestock can be produced	Areas where the PV modules and other infrastructure will be constructed, will no longer be available for livestock production.	Local	None identified at this stage

Soil compaction	Soil compaction will occur wherever construction vehicles and equipment will traverse the site and where the PV modules and other long-term infrastructure will be erected.	Local	None identified at this stage
Soil erosion	Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal, the establishment of hard standing areas and roads, and the presence of panel surfaces. Erosion will cause loss and deterioration of soil resources and may occur during all phases of the project.	Local	None identified at this stage
Soil chemical pollution	Due to oil and fuel spillages as well as waste generation during the project cycle.	Local	None identified at this stage

Description of expected significance of impact

The significance of agricultural impacts is influenced by the extremely limited agricultural capability of the site, with no cultivation practises, and that the footprint of disturbance will only impact on a portion of the total land surface. The agricultural potential of the broader area will not be affected by the proposed project. The site has low land capability and a low carrying capacity, and although the proposed development footprint will cover a surface area of 176ha (to be confirmed in the EIA Phase), it is not anticipated that the inherent agricultural potential of the site will be changed permanently by the project. The proposed project may have a moderate to major positive impact on the current land use.

Gaps in knowledge & recommendations for further study

The appropriate placement of the PV facility and other infrastructure to be assessed considering the slopes and erodibility of the soils present on the site. The following will be assessed in the EIA phase:

- Soil conditions/classification
- Erosion potential and mitigation
- Activities and materials that may result in soil pollution
- Current land use viability

7.3.4 Impacts on Heritage (Archaeology and Palaeontology)

» **Heritage and archaeological resources**

Based on previous archaeological assessments located immediately adjacent to the Dicoma PV, it was found that the arear had been disturbed and transformed by agricultural activities in a similar way to the area proposed for this development. Pre-existing agricultural plough fields, grazing areas and farm buildings were identified in the development area. Furthermore, throughout the farming areas several heaps of rocks that were removed from the agricultural fields were identified. During the previous field assessment of the adjacent sites no archaeological resources, graves or burial grounds were identified.

» **Paleontological resources**

Regarding palaeontological resources, according to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by geological sediments of low and moderate sensitivity for impacts to palaeontology. As such, it is unlikely that significant palaeontological heritage will be impacted by the facility.

» **Palaeontology**

Taking account that the site proposed for development is in the Malmani Subgroup which contains a number of stromatolitic dolomites, the potential impact to fossil heritage resources is negligible to extremely low. As such, the proposed development is unlikely to negatively impact significant palaeontological heritage resources.

» **Cultural landscape**

The area has not been identified as part of special or recognised cultural landscape, and as such there is no impact in the cultural landscape.

Sensitivity Analysis of the Site

The Palaeosensitivity was identified as very high in terms of the SAHRIS Palaeontological Sensitivity Map (refer to **Figure 7.3**), the geological structures suggest that the rocks are unlikely to contain fossils other than blue-green algae. Taking account of the defined criteria, the potential impact to fossil heritage resources is negligible to extremely low. As such, the proposed development is unlikely to negatively impact significant palaeontological heritage resources. The no-go buffer area implemented around the potential burial sites have been excluded from the proposed development area.

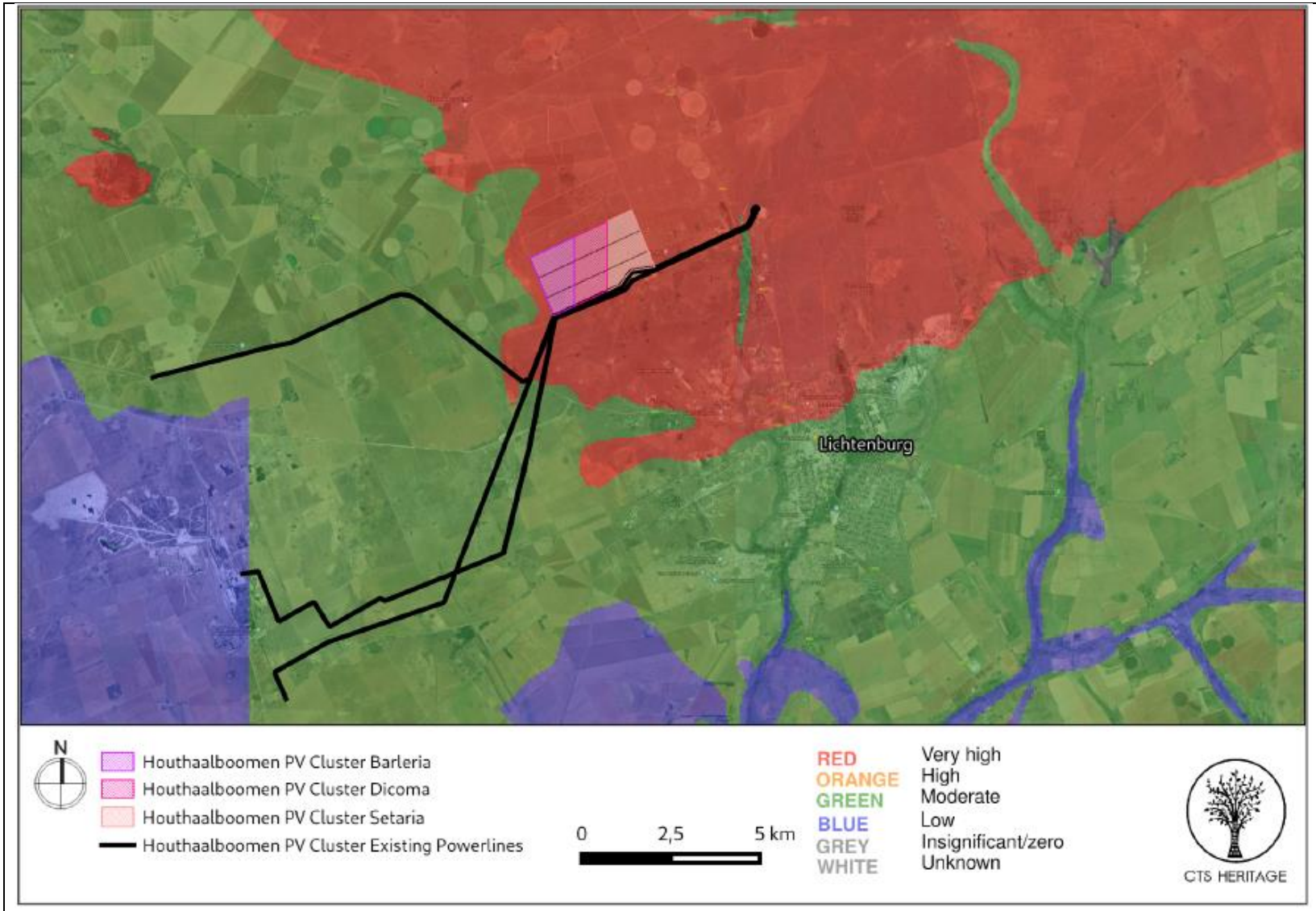

Figure 7.3: Palaeosensitivity map indicating fossil sensitivity underlying the study area

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Direct impact to archaeological sites, historical sites and burial sites	The construction phase could directly impact on surface and subsurface archaeological sites.	Local	None identified at this stage
Damage or destruction of unmarked graves	Damage or destruction of unmarked graves during the construction of project infrastructure.	Local	None identified at this stage
Damage or destruction of fossil materials	Damage or destruction of fossil materials during the construction of project infrastructure to a maximum depth of those excavations.	Local	None identified at this stage
Impacts on the cultural landscape	The area has not been identified as part of special or recognised cultural landscape, and as such there is no impact in the cultural landscape.	There is no impact	None identified at this stage
Description of expected significance of impact No highly significant impacts to archaeological or palaeontological materials/resources are expected as a result of the development. It is however possible that artefacts will be revealed during construction activities. Due to the generally low cultural significance of the archaeological materials, the intensity of impacts is not expected to be high, and the resulting significance would likely be low. The significance of this impact will be confirmed during the EIA Phase.			
Gaps in knowledge & recommendations for further study » Specialist archaeology assessment and specialist palaeontology assessment are completed for integration into the Heritage Impact Assessment			

7.3.5 Visual Impacts

Existing Settlements and Infrastructure

Farm settlements or residences occur at irregular intervals throughout the study area. Some of these, in close proximity to the proposed development site, include: Houthaalbomen, Boskoppie, Elandsfontein, Brakpan, Scherppunt, Greeflaagte, etc. The Elandsfontein small holdings are located east of the farm identified for the PV facility

Visual impact of the facility on observers in close proximity to the proposed PV plant infrastructure and activities. Potential sensitive visual receptors include:

- Residents of the Elandsfontein small holdings
- Residents of homesteads and farm dwellings (in close proximity to the facility)
- Observers travelling along the arterial and secondary roads

Sensitivity Analysis of the Site

The result of the viewshed analysis for the proposed facility is shown on the map below. The viewshed analysis was undertaken from a representative number of vantage points within the development footprint at an offset of 4m above ground level (**Figure 7.4**). This was done in order to determine the general visual exposure (visibility) of the area under investigation, simulating the maximum height of the proposed structures (PV panels and inverters) associated with the facility.

The viewshed analysis will be further refined once a preliminary and/or final layout is completed and will be regenerated for the actual position of the infrastructure on the site and actual proposed infrastructure during the EIA phase of the project. **Figure 7.4** also indicates proximity radii from the development footprint in order to show the viewing distance (scale of observation) of the facility in relation to its surrounds.

The development would be easily visible within a 1km radius of the site. This area of visual exposure (0 – 1km) is generally restricted to vacant farmland and agricultural fields but may contain some potential sensitive visual receptors. This pattern of exposure is generally attributed to the flat topography of the study area, with no hills or ridges influencing or interrupting the viewshed analysis. There is a single residence (Scherppunt 1) within this zone (to the west of the PV facility).

Within a 1 – 3km radius, the visual exposure is more scattered and interrupted due to the undulating nature of the topography. Most of this zone falls within vacant open space and agricultural land but does include some farm dwellings and residences. Some of these include Scherppunt 2, and Houthaalboomen 1 and 2, as well as residences within the western section of the Elandsfontein small holdings. The R503 arterial road traverses a section of this zone to the south, where the facility may be visible.

Visibility between the 3 - 6km radii is greatly reduced but does include sections of the R505 and R503 arterial roads and a number of farm residences, namely Boskoppie, Elandsfontein, and Brakpan as well as the Elandsfontein small holdings.

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (development) and the observer. The town of Lichtenburg is located beyond 6km from the facility, and although visibility my theoretically be possible, it is highly unlikely due to the built-up nature of the town.

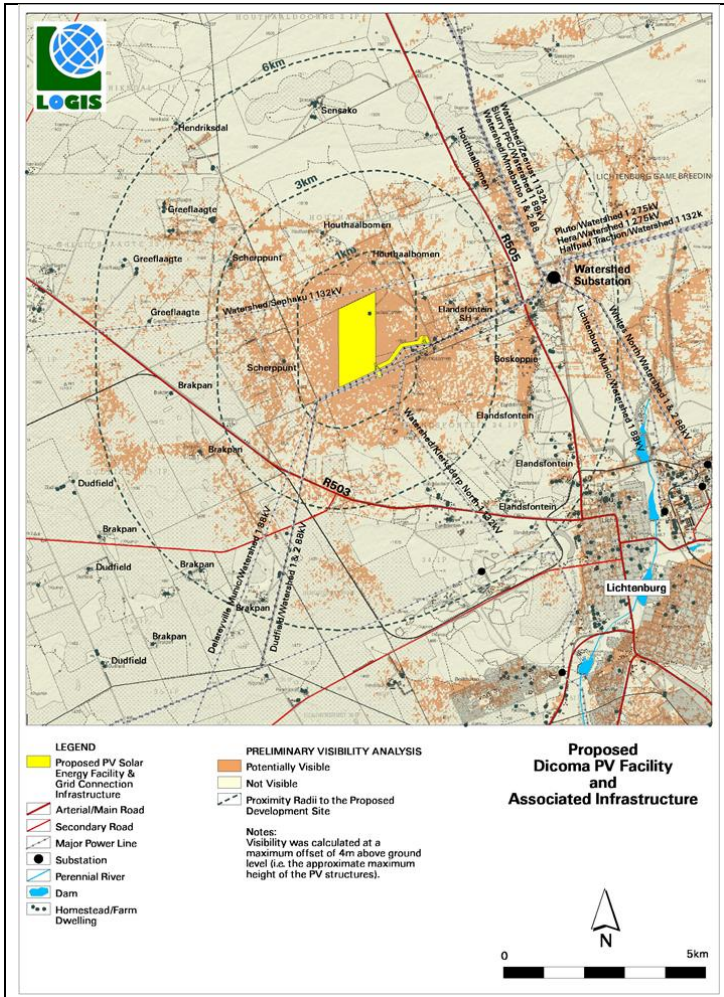

Figure 7.4: Preliminary visual exposure of the Dicoma PV facility

Issues	Nature of Impact	Extent of Impact	No-Go Areas
The viewing of the PV plant infrastructure and activities	The potential negative experience of viewing the infrastructure and	Local to regional	None identified at this stage
The visibility of the facility to, and potential visual impact on, observers travelling along the secondary or arterial roads within the study area.			

The visibility of the facility to, and potential visual impact on residents of dwellings within the study area, with specific reference to the farm residences or small holdings in closer proximity to the development.	activities within a predominantly undeveloped setting		
The potential visual impact of the facility on the visual character or sense of place of the region.			
The potential visual impact of the facility on tourist routes or tourist destinations/facilities (if present).			
The potential visual impact of the construction of ancillary infrastructure (i.e. internal access roads, buildings, etc.) on observers in close proximity to the facility.			
The visual absorption capacity of the natural vegetation (if applicable).			
Potential visual impacts associated with the construction phase.			
Description of expected significance of impact Due to the nature and location of the facility, there is likely to be a long-term influence on surrounding landscape character as experienced by the receptors. The impact significance is therefore anticipated to be moderate to high. The significance of this impact will be confirmed during the EIA Phase.			
Gaps in knowledge & recommendations for further study A finalised layout of the PV plant and ancillary infrastructure are required for further analysis. This includes the provision of the dimensions of the proposed structures and ancillary equipment. Additional spatial analyses are required in order to create a visual impact index that will include the following criteria: » Visual exposure » Visual distance/observer proximity to the structures/activities » Viewer incidence/viewer perception (sensitive visual receptors) » Visual absorption capacity of the environment surrounding the infrastructure and activities Additional activities: » Identify potential cumulative visual impacts » Undertake a site visit » Recommend mitigation measures and/or infrastructure placement alternatives			

7.3.6 Social Impacts

The proposed development supports the social and economic development through enabling skills development and training in order to empower individuals and promote employment creation within the area. The development would mainly focus on economic benefits to the area and other dimensions of impacts such as influx of jobseekers into the local area will need to be weighed.

The findings of a previous study which considered the development of renewable energy projects in this area indicated that the development of such projects would make a notable positive economic impact on the local economies of the Ditsobotla Local Municipality due to the increase in construction activities in the area and the demand created for various services. It is anticipated that the local unemployment rates would notably decline during the construction period. The Project could create much needed employment opportunities in the area and will contribute to the overall objective of national government of diversifying energy sources in the country and improving energy security. The positive socio-economic impacts that are associated with the Project include skills development in the respective industries, increase in government revenue, improved livings standards of households who will benefit from created employment, as well as long-term injections into the local economies through SED and ED commitments during operations.

Issues	Nature of Impact	Extent of Impact	No-Go Areas
Creation of several direct and indirect employment opportunities, which will assist in addressing unemployment levels within the area and aid in skills development of communities in the area.	Positive – The creation of employment opportunities and skills development will assist to an extent in alleviating unemployment levels within the area.	The impact will occur at local, regional, and national levels.	None identified at this stage
Economic multiplier effects from the use of local good and services during the construction phase.	Positive – There are likely to be opportunities for local businesses to provide goods and services during the construction phase of development.	The impact will occur at a local level.	None identified at this stage
Increased pressure on infrastructure and basic services, and social conflicts during construction as a result of in-migration of people.	Negative – The in-migration of job seekers to the area could result in increased pressure being placed on infrastructure and basic services, and a rise in social conflicts.	The impact will occur at a local level.	None identified at this stage
Temporary increase in safety and security concerns associated with the influx of people during the construction phase.	Negative – The in-migration of job seekers to the area could be perceived to result in increased criminal activity.	The impact will occur at local, level	None identified at this stage
Temporary increase in traffic disruptions and movement patterns during construction	Negative – An increase in traffic due to construction vehicles and heavy vehicles could create short-term disruptions and safety hazards for current road users.	The impact will occur at a local level.	None identified at this stage

Nuisance impacts in terms of temporary increase in noise and dust, and wear and tear on access roads to the site.	Negative – The impact will negatively impact sensitive receptors and could cause disruptions for neighbouring properties.	The impact will occur at a local level.	None identified at this stage
Creation of direct and indirect employment and skills development opportunities and skills development as a result of the operation of the project.	Positive – The creation of employment opportunities and skills development will assist to an extent in alleviating unemployment levels within the area.	The impact will occur at a local, regional and national level.	None identified at this stage
Development of non- polluting, renewable energy infrastructure.	Positive – Increasing the contribution of the RE sector to the local economy would contribute to the diversification of the local economy and provide greater economic stability.	The impact will occur at local, regional, and national levels	None identified at this stage
Benefits to the local area from Socio-Economic Development (SED)/ Enterprise Development (ED) programmes and community trust from REIPPP Programme social responsibilities.	Positive – The creation of employment opportunities, skills development, and the proposed projects contributions to local economic development will assist to an extent in both alleviating unemployment levels within the area and improving the quality of life.	The impact will occur at local, regional, and national levels	None identified at this stage

Description of expected significance of impact

At its peak, the construction is likely to result in the creation of approximately 300 – 400 employment opportunities. Of those employment opportunities available, approximately 60% will comprise opportunities for low skilled workers, 25% for semi-skilled workers, and 15% for skilled workers. Skills developed through experience in the construction of the facility will be retained by the community members involved. The impact is likely to be positive, local to national in extent, short-term, and of medium significance.

Economic multiplier effects from the use of local goods and services opportunities include but are not limited to, the provision of construction materials and equipment, and workforce essentials such as services, safety equipment, ablution, accommodation, transportation and other goods. The increase in demand for goods and services may stimulate local business and local economic development (however locally sourced materials and services may be limited due to availability). There is likely to be a direct increase in industry and indirect increase in secondary businesses. The impact is likely to be positive, local to regional in extent, short-term, and of medium significance.

An influx of jobseekers into an area, could lead to a temporary increase in the level of crime, cause social disruption and put pressure on basic services. It could also potentially create conflict between locals and outsiders due to potential differences in racial, cultural and ethnic composition. A further negative impact that could result due to an influx of jobseekers into an area is an increase in unemployment levels due to an oversupply of available workforce, particularly with respect to semi- and unskilled workers.

The commencement of construction activities can be associated with an increase in crime within an area. The perceived loss of security during the construction phase of a project due to an influx of workers and / or outsiders to the area (as in-migration of newcomers, construction workers or jobseekers are usually associated with an increase in crime), may have indirect effects such as increased safety and security concerns for neighbouring properties, damage to property, increased risk of veld fire, stock theft, poaching, crime and so forth.

Increased traffic due to construction vehicles and heavy vehicles could cause disruptions to road users and increase safety hazards. The use of local roads and transport systems may cause road deterioration and congestion. The impact is likely to be negative, local in extent, short-term, and of low significance given the proximity of the project to existing mining operations within the area

Nuisance impacts associated with construction related activities include noise, dust, and possible disruption to adjacent properties. Site clearing activities increase the risk of dust and noise being generated, which can in turn negatively impact on adjacent properties. The movement of heavy construction vehicles and construction activities and equipment also have the potential to create noise, as well as impacts on travellers travelling along the R505 national road, and gravel access roads. The primary sources of noise during construction would be from construction equipment, vehicle and truck traffic. Noise levels can be audible over a large distance although are generally short in duration. Dust would be generated from construction activities as well as trucks / vehicles driving on gravel access roads. This impact will negatively impact sensitive receptors. The impact of noise and dust on sensitive receptors can be reduced through the application of appropriate mitigation measures.

Intrusion impacts such as aesthetic pollution (i.e. building materials, construction vehicles, etc.), noise and light pollution will impact the "sense of place" for the local community. Construction related activities have the potential to negatively impact a local area's "sense of place". Such an impact is likely to be present during the construction phase. It is however expected that the power line will only affect areas and receptors that have already been exposed to other existing grid connection infrastructure (i.e. power lines and substations) and other industrial infrastructure, specifically mining related infrastructure (i.e. for which the sense of place has already been altered).

Under the REIPPP Programme renewable energy projects are required to contribute to local economic development in the area. Awarded projects are required to spend a certain amount of their generated revenue (as defined in the agreement with DoE) on Socio-Economic Development (SED) and Enterprise Development (ED) and share ownership in the project company with local communities. The impact is likely to be positive, local to national in extent, long-term, and of high significance.

Gaps in knowledge & recommendations for further study

- The PV facility will require further assessment during the EIA phase. This will involve obtaining an understanding of how the facility will directly affect the local communities by conducting interview and collecting information on the environmental and historical trends.
- Information on exact direct and indirect employment opportunities and skills development programmes likely to be created during operation are needed.
- Mitigation measures for the Environmental Management Programme are required at the EIA phase.

7.4 Evaluation of Potential Cumulative Impacts Associated with the project

Impacts of a cumulative nature place the direct and indirect impacts of the proposed project into a regional and national context, particularly in view of similar or resultant developments and activities in the region. Potential cumulative impacts associated with Dicoma PV are described below, and will be assessed in detail as part of the subsequent EIA phase to be conducted for the project.

Impact

Cumulative impacts, in relation to an activity, refer to the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area. For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited to effects that can be evaluated meaningfully (DEAT, 2004). It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by solar PV facility developments throughout South Africa, while the significance of the cumulative impact on the visual amenity may only be influenced by solar PV facility developments that are in closer proximity to each other. For practical purposes a sub-regional scale of 30km is considered for the evaluation of cumulative impact of PV facilities.

The cumulative impacts associated with Dicoma PV have been viewed from two perspectives within this Scoping Report:

- Cumulative impacts associated with the scale of the project (one 75MW PV Facility on the project site); and
- Cumulative impacts associated with other relevant planned, approved or existing solar developments within a 30km radius of the project site (multiple PV facilities in the proximity of the site).

Cumulative effects are commonly understood as the impacts which combine from different projects, and which result in significant change, which is larger than the sum of all the impacts (DEAT, 2004). The complicating factor is that the projects that need to be considered are from past, present and reasonably foreseeable future development. Cumulative effects can be characterised according to the pathway they follow. One pathway could be the persistent additions from one process. Another pathway could be the compounding effect from one or more processes. Cumulative effects can therefore occur when impacts are:

- Additive (incremental);
- Interactive.
- Sequential; or
- Synergistic.

Canter and Sadler (1997) describe the following process for addressing cumulative effects in an EIA:

- Delineating potential sources of cumulative change (i.e. GIS to map the relevant renewable energy facilities in close proximity to one another);
- Identifying the pathways of possible change (direct impacts);
- Indirect, non-linear or synergistic processes; and
- Classification of resultant cumulative changes.

The site for the proposed development (Portion 1 of the Farm Houthaalboomen 31, Portion 9 of the Farm Houthaalboomen 31 and Portion 10 of the Farm Houthaalboomen 31) is located within 30km from several other authorised solar PV facilities. These projects include the following:

Project Name	Distance from the proposed site	Project Status
Lichtenburg 1 Solar PV (75MW)	8.8km north-east	Environmental Authorisation issued
Lichtenburg 2 Solar PV (75MW)	5.4 km north-east	Environmental Authorisation issued
Lichtenburg 3 Solar PV (75MW)	7.7 km north-east	Environmental Authorisation issued
Tlisitseng PV cluster 2(75MW)	9.8 km south-west	Environmental Authorisation issued
Hibernia Solar Energy Facility (5MW)	9.8 km south-west	Environmental Authorisation issued

In addition to the solar energy developments listed in **Error! Reference source not found.**, two new 75MW PV solar energy facilities are proposed for development on the same properties, namely:

Project Name	Affected property	Contracted Capacity
Barleria PV	Portion 1 of the Farm Houthaalboomen 31 Portion 9 of the Farm Houthaalboomen 31 Portion 10 of the Farm Houthaalboomen 31	75MW
Setaria PV	Portion 1 of the Farm Houthaalboomen 31 Portion 9 of the Farm Houthaalboomen 31 Portion 10 of the Farm Houthaalboomen 31	75MW

The cumulative impacts that have the potential to be compounded through the development of the solar PV facility and its associated infrastructure in proximity to other similar developments include impacts such as those listed below. The role of the cumulative assessment is to test if such impacts are relevant to Dicoma PV within the development area being considered for the development:

- Unacceptable loss of threatened or protected vegetation types, habitat or species through clearing, resulting in an impact on the conservation status of such flora, fauna or ecological functioning.

» Unacceptable risk to freshwater features through disturbance associated with construction activities and increased runoff and erosion during the operation phase. » Unacceptable risk to avifauna through habitat loss, displacement and collision with PV panels. » Unacceptable loss of high agricultural potential areas presenting a risk to food security and increased soil erosion. » Unacceptable loss of heritage resources (including palaeontological and archaeological resources); » Complete or whole-scale change in the sense of place and character of an area and unacceptable visual intrusion; and » Unacceptable impact to socio-economic factors and components.
Summary of the nature, significance, consequence, extent, duration and probability of the impacts » The above-mentioned impacts are considered to be probable, although it is anticipated that the extent, duration, and magnitude of these impacts can be minimised to levels where this impact can be regarded as having low significance through the implementation of appropriate mitigation measures. » The operational lifespan of the project and other solar energy facilities within the surrounding areas is expected to be long-term (i.e. a mimumum of 20 years) and subsequently the impact is also expected to be long-term. » The impact associated with the proposed development is expected to be local, affecting mainly the immediate environment and surrounding areas, as well as other renewable energy facilities within the vicinity.
Gaps in knowledge & recommendations for further study: » Each specialist study will consider and assess the cumulative impacts of proposed, approved and authorised renewable projects in the area. » Cumulative impacts will be fully assessed and considered in the EIA phase.

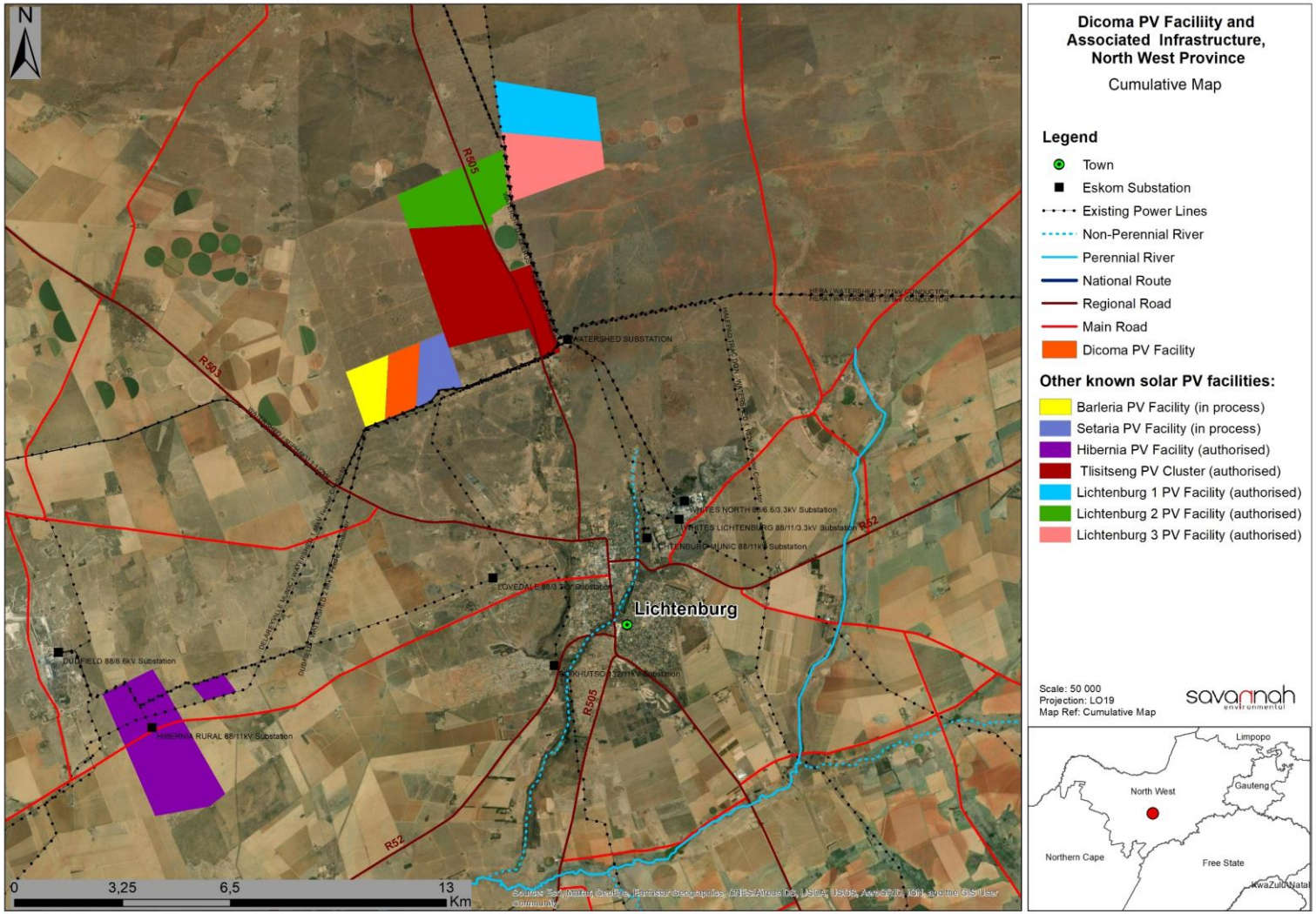

Figure 7.5: Cumulative map illustrating other approved and/or constructed PV facilities located within the vicinity of the Dicoma PV project site (**Appendix J**).

CHAPTER 8: CONCLUSION

This Scoping Report is aimed at detailing the nature and extent of the proposed development, identifying and describing potential issues associated with developing the Dicoma PV facility and associated infrastructure, identifying potential environmental fatal flaws and/or areas of sensitivity, and defining the extent of studies required to be undertaken as part of the detailed EIA phase. This was achieved through an evaluation of the proposed project, involving the project proponent, and specialist consultants. This Scoping Report has been compiled in terms of the 2014 EIA Regulations (GNR 326) published in terms of Section 24(5) of NEMA.

A summary of the conclusions of the evaluation of the potential impacts identified to be associated with the project is provided in **Section 8.2**. Recommendations regarding investigations required to be undertaken within the detailed EIA phase are provided within the Plan of Study for EIA (**Chapter 9**).

8.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(g)(xi) a concluding statement indicating the preferred alternatives, including the preferred location of the activity.	An overall conclusion and fatal flaw analysis regarding the Dicoma PV facility is included within **Section 8.4**.

8.2 Conclusions drawn from the Evaluation of the PV Facility Development

Dicoma PV Facility is proposed on Portion 1 of the Farm Houthaalboomen 31, Portion 9 of the Farm Houthaalboomen 31, Portion 10 of the Farm Houthaalboomen 31, which is located approximately 5km north-west of the town of Lichtenburg in the North West Province. PV technology is proposed to be utilised for the generation of electricity, and the Dicoma PV facility will have a contracted capacity of up to 75MW. The grid connection infrastructure between the facility and the Eskom grid connection point is considered within a 100m corridor located on the southern boundary of Portion 1 of the Farm Houthaalboomen 31, with a LILO connection traversing Portion 0 of Farm Talene 25 and Portion 7 of Farm Elandsfontein 34. Two alternative grid connection solutions are proposed and evaluated.

The infrastructure associated with the solar PV facility, including all associated infrastructure will include:

- PV modules and mounting structures
- Inverters and transformers
- Battery Energy Storage System (BESS)
- Site and internal access roads (up to 8m wide)
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Temporary and permanent laydown area
- Grid connection solution (two alternative locations assessed) within a 100m wide corridor, including:
  - 33kV cabling between the project components and the facility substation
  - A 132kV facility substation

- A 132kV Eskom switching station
- A Loop-in-Loop out (LILO) overhead 132kV power line between the Eskom switching station and the existing Delareyville Munic–Watershed 1 88kV power line.[25]

The Scoping study included the identification of potential impacts associated with the project through specialist inputs and consultation with affected parties and key stakeholders. A preliminary evaluation of the extent and significance of potential impacts associated with the development of Dicoma PV have been detailed in Chapter 7. These will be assessed in detail through the EIA Phase assessment, which will include independent specialist assessments.

This scoping study has identified minimal areas of higher sensitivity within the development area to assist in focussing the location of the development footprint for Dicoma PV to minimise the potential for environmental impact. The extent of the project site is approximately 552ha and has been considered in this Scoping report. A development area[26] of ~176ha was demarcated within this study area and allows an adequate footprint for the installation of a solar PV facility with a contracted capacity of up to 75MW$_{AC}$, while allowing for the avoidance of environmental site sensitivities. The size of the development footprint[27] within the development area will be confirmed in the EIA phase once the facility layout is available for assessment.

The majority of potential impacts identified to be associated with the construction of Dicoma PV and associated infrastructure are anticipated to be localised and restricted to the development area itself and the grid connection corridor alternatives, while operation phase impacts/benefits range from local to regional. No environmental fatal flaws were identified to be associated with the development area. Minimal areas or features of high sensitivity were identified to be avoided by the development footprint.

The potentially significant issues related to the **construction** of the Dicoma PV facility include:

» Biodiversity and habitat loss and impacts on flora, fauna and avifauna resulting from activities such as site clearance for installation of the facility components and associated infrastructure.
» Soil erosion, loss or degradation due to site clearance and compaction for installation of the facility components and associated infrastructure and due to the construction on internal access roads.
» Impact on heritage and paleontological resources through construction activities.
» Visual impacts on the landscape.
» Social impacts, both positive and negative (job creation and business opportunities, impacts associated with construction workers in the area).

The potentially significant issues related to the **operation** of the Dicoma PV facility include:

[25] The LILO corridor intersects with several existing parallel Eskom power lines (Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, Dudfield-Watershed 1 88kV, and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above-mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.
[26] The development area is that identified area (located within the project site) where the Dicoma PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~176ha in extent.
[27] the defined area (located within the development area) where the PV panel array and other associated infrastructure for Dicoma PV is planned to be constructed. The Dicoma PV development footprint will be defined during the EIA phase

» Change in land use from agriculture to energy generation.
» Habitat loss due to spread of alien vegetation
» Visual impacts.
» Positive social and economic impacts through job creation and economic benefits.

8.3 Sensitivity Analysis for the Development Area and Grid Connection Corridors

The potentially sensitive areas which have been identified through the environmental scoping study are listed below and illustrated in **Figure 8.1**. The scoping phase sensitivity map provides an informed estimate of the sensitivity on the project site, and specifically the Dicoma PV development area (indicated with the yellow outline) and associated grid connection corridor (alternatives indicated as purple and hatched corridors). The detail is based on the desktop review of available baseline information for the project site, as well as the sensitivity data from specialist studies undertaken during the scoping phase, which included field surveys. During the site and desktop surveys, the affected area was investigated in sufficient detail in order to provide definitive insight into the potential for constraining factors on the site. The sensitivity map must be used as a tool by the developer to avoid any areas flagged to be of higher risk or sensitivity and inform the location/layout of the development footprint for the facility and associated infrastructure. The development footprint is the area which will be assessed further in detail in the EIA Phase, in order to provide an assessment of environmental acceptability and suitability of the facility layout of the Dicoma PV Facility.

Ecological Sensitive Features

The majority of the project site consists of natural to Near-natural Open Savanna Grassland. A small portion of the Solar PV development area (along the eastern boundary) is located within a terrestrial ESA1, whilst most of the grid infrastructure options are located within the terrestrial ESA1. The initial desktop assessment of the project site indicates that a few protected and red-data species as well as sensitive habitats potentially occur on the site. The following preliminary ecological sensitivities have been identified:

» Medium Ecological Sensitivity:
  - Natural to Near-natural Open Savanna Grassland. All natural, intact grassland areas that is classified as ESA1. These grasslands may potentially be suitable for the presence of SCC (fauna and flora).
» Medium-Low Ecological Sensitivity:
  - Re-established grassland on historical cultivated areas. These are historically transformed areas located within the ESA1 and which are now covered by a stable plagio-climax grassland.

There are no areas identified which are required to be excluded from the proposed development footprint.

Avifauna Sensitive Features

Open mixed woodland, artificial livestock watering points and extensive open grassland and bush clump mosaics habitat units comprising of potential sensitive avifauna features have been observed on the project site. The following preliminary avifauna sensitivities have been identified:

» Medium Avifauna Sensitivity:
  - The mixed woodland was observed to be used as roosting platforms for vultures (observed during the dry season survey in August 2021) and supported areas where a higher number of bird species are anticipated to occur.

- The artificial livestock watering points attracted large numbers of granivore passerine and non-passerine bird species, of which many need to drink water on a daily basis. These areas are however of artificial origin, and would be relocated to other areas outside of the development area.
- The extensive open grassland and bush clump mosaics provide potential suitable foraging habitat for some collision-prone bird species, including the Northern Black Korhaan (*Afrotis afraoides*). However, abundance of threatened and near threatened bird species are anticipated to be relatively low, thereby suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat is natural. In addition, the open grassland and bush clump mosaics are widespread in the region.

There are no areas identified which are required to be excluded from the proposed development footprint.

Soils and agricultural potential Sensitive Features

The project site is currently only used for livestock grazing and the shallow, rocky nature of the soils within the area limits the potential for rainfed crop production. These soils may be suitable for irrigated farming however no such activities are currently taking place.. As such, the development of the facility will not have a significant impact on the current land use,. The following preliminary soil an agricultural sensitivity has been identified:

» Medium Agricultural Sensitivity:
- Suitable livestock grazing capacity. Also, soils may be suitable for irrigated farming although the development area is not equipped with irrigation infrastructure.

There are no areas identified which are required to be excluded from the proposed development footprint.

Heritage sensitive features, the cultural landscape (incl. archaeology, palaeontology, and cultural landscape)

» No-Go Area:
- A 10m no-go and no development buffer is implemented around the potential burial sites

These areas have been excluded from the proposed development footprint.

Although the palaeosensitivity was identified as very high in terms of the SAHRIS Palaeontological Sensitivity Map, the geological structures suggest that the rocks are unlikely to contain fossils other than blue-green algae. Taking account of the defined criteria, the potential impact to fossil heritage resources is negligible to extremely low. As such, the proposed development is unlikely to negatively impact significant palaeontological heritage resources.

Sense of Place

Visibility zones of the PV Facility mostly falls within vacant open space and agricultural land but does include some farm dwellings and residences. Potentially sensitive visual receptors include Scherppunt 2, and Houthaalboomen 1 and 2, as well as residences within the western section of the Elandsfontein small holdings, and viewers from sections of the R505 and R503 arterial roads. Although the proposed infrastructure may be visible does not necessarily imply a high visual impact

8.4 Overall Conclusion and Fatal Flaw Analysis

The development area for the Dicoma PV project is outlined in Orange in **Figure 8.1.** The findings of the Scoping Study indicate that no environmental fatal flaws are associated with the Dicoma PV project. While some impacts of potential significance do exist, it is anticipated that the implementation of appropriate mitigation measures would assist in reducing the significance of such impacts to acceptable levels. It is however recommended, that the development area for the development of the facility be considered outside of the areas identified as no-go areas as far as possible in order to ensure that the development does not have a detrimental impact on the environment. This forms part of the 'funnel-down approach' for the identification of an appropriate development footprint within the development area. Even with the appropriate avoidance of sensitive areas, there is an adequate area on the site which can accommodate the planned 75MW facility with relatively low impacts on the environment. This area is referred to as the development area.

With an understanding of which areas within the development area and grid connection corridors are considered sensitive to the development of the proposed facility, the Applicant can prepare the detailed infrastructure layout for consideration within the EIA Phase. During the EIA phase, more detailed environmental studies will be conducted in line with the Plan of Study for EIA contained in **Chapter 9** of this Scoping Report. These studies will consider the detailed facility layout produced by the Applicant and make recommendations for the implementation of avoidance strategies (if required), and mitigation and management measures to ensure that the final assessed layout retains an environmental impact within acceptable limits. The sensitivity map will be further refined in the EIA phase on the basis of these specialist studies, in order to provide an assessment of environmental acceptability of the final design of the facility.

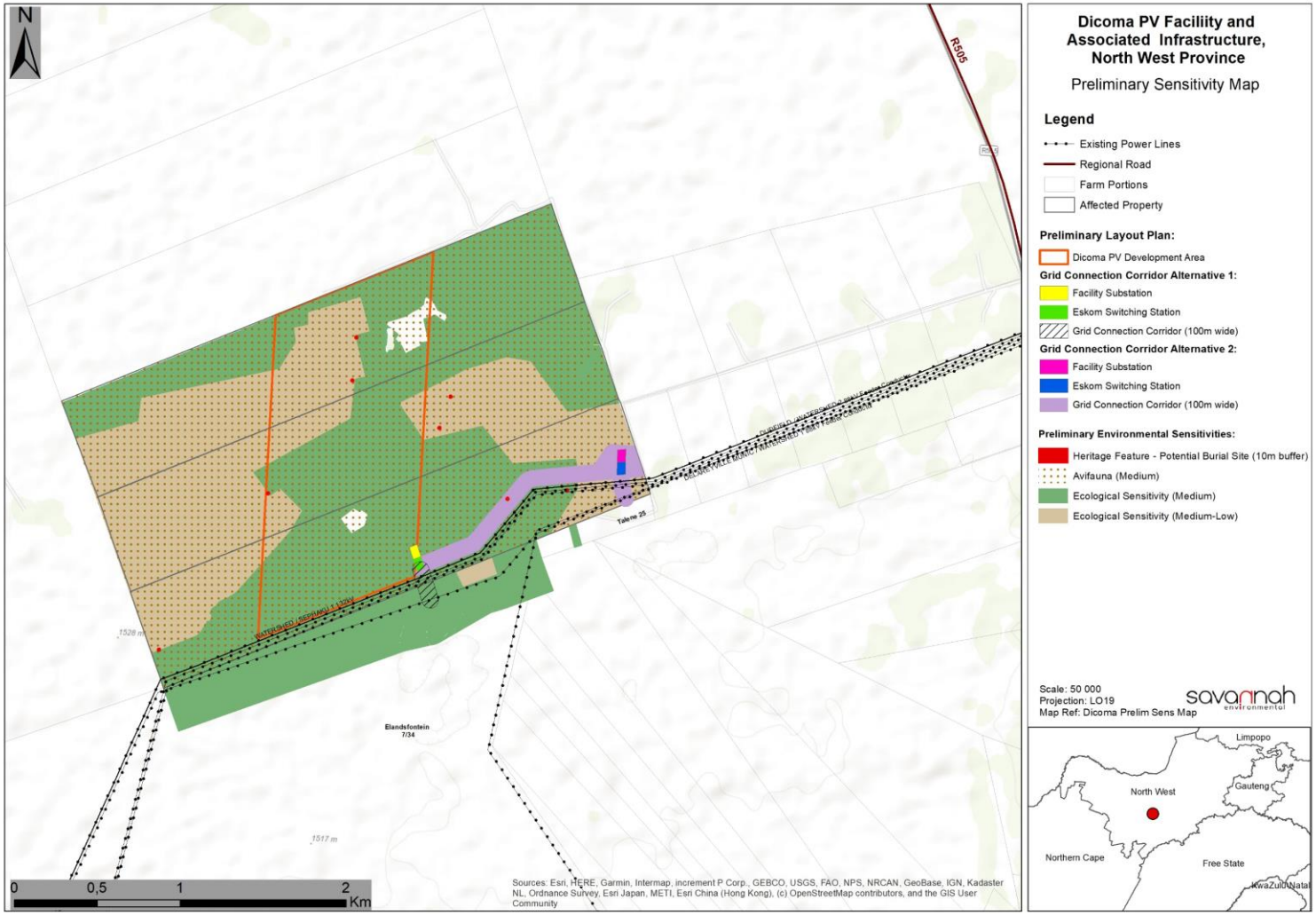

Figure 8.1: Environmental Sensitivity Map from the results of the scoping evaluation for the Dicoma PV Facility and associated infrastructure. The sensitivity map indicates the sensitivities for the project site, as well as the Dicoma PV development area (indicated with the orange outline) and the grid connection corridor alternatives (purple and hatched corridors).

CHAPTER 9: PLAN OF STUDY FOR EIA

One of the key objectives of the Scoping phase is to determine the level of assessment to be undertaken within the EIA Phase of the process. This will include the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken. This is to determine the impacts and risks a particular activity will impose on a 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.

This Chapter contains the Plan of Study for the EIA for Dicoma PV and associated infrastructure. The findings of the Scoping Phase include inputs from the EIA specialist team. The findings are used to inform the Plan of Study for EIA together with the requirements of the 2014 EIA Regulations (GNR 326) and applicable guidelines. The Plan of Study for EIA describes how the EIA Phase will proceed and includes details of the independent specialist studies required to be undertaken to assess the significance of those impacts identified within the Scoping Study to be of potential significance.

9.1 Legal Requirements as per the EIA Regulations, 2014 (as amended) for the undertaking of an Impact Assessment Report

This chapter of the scoping report includes the following information required in terms of Appendix 2: Content of the Scoping Report:

Requirement	Relevant Section
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including - (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; (ii) a description of the aspects to be assessed as part of the environmental impact assessment process; (iii) aspects to be assessed by specialists; (iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) a description of the proposed method of assessing duration and significance: (vi) an indication of the stages at which the competent authority will be consulted; (vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and (viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process; (ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	A plan of study for the undertaking of the EIA Phase for Dicoma PV is included within this chapter.

9.2 Objectives of the EIA Phase

The EIA will assess the potential direct, indirect and cumulative environmental impacts and benefits associated with each phase of the development including design, construction, operation, and decommissioning. The EIA will aim to provide the Competent Authority with sufficient information to make an informed decision regarding the proposed development. The site layout being proposed, will be assessed by a range of independent specialist studies. Furthermore, as required in terms of the 2014 EIA Regulations (GNR 326), the assessment will also include an assessment of the "do nothing" (i.e. no-go) alternative.

The EIA Phase will aim to achieve the following:

» Provide an overall assessment of the social and biophysical environment affected by the Dicoma PV facility.
» Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the Dicoma PV facility.
» Identify and recommend appropriate mitigation measures for potentially significant environmental impacts.
» Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

9.3 Consideration of Alternatives

The following project alternatives will be investigated in the EIA:

Type of Alternatives Considered	Description of the Alternatives relating to the Dicoma PV
Site-specific Alternatives	Privately owned farm portions have been identified for the development of the Dicoma PV facility, taking advantage of the site-specific characteristics such as the solar irradiation; as well as the largely transformed nature of the site. The study area which is 552ha in extent and in which a development area (179ha) and grid corridor has been identified, is considered to be large enough for the development of a PV facility with a contracted capacity of up to 75MW, while allowing for avoidance of environmental sensitivities, as may be required in line with the mitigation hierarchy.
Design and Layout Alternatives	The layout for the development of the Dicoma PV Facility will be designed in line with the environmental sensitivities identified during this scoping phase. The detailed facility layout will be made available as a layout alternative for assessment and ground-truthing by the independent specialists in the EIA phase. Where further conflicts are predicted, a mitigation strategy will be developed to meet the objectives of the mitigation hierarchy (avoid, minimise, mitigate), thereby ensuring that the layout plan taken forward for consideration during the EIA Phase is the most optimal from an environmental perspective. Two alternative grid connection corridors will be assessed in the EIA Phase. The following grid connection alternatives will be assessed comparatively assessed to determine the most optimal route from an environmental perspective: ***Grid Connection Alternative 1:*** 33kV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other approximately 1.3km east of the eastern boundary of the Dicoma PV facility development area, on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the

	Delareyville Munic–Watershed 1 88kV[28] . The grid connection infrastructure is located within an assessment corridor 100m in width. ***Grid Connection Alternative 2:*** 33kV MV cabling will connect the Dicoma PV facility solar array to the 132kV facility substation. The facility substation and Eskom switching station are located directly adjacent to each other, and infringes on the eastern boundary of the Dicoma PV facility development area, on Portion 1 of the Farm Houthaalboomen 31. A 132kV loop-in-loop out power line from the Eskom switching station will connect into the Delareyville Munic–Watershed 1 88kV. The grid connection infrastructure is located within an assessment corridor of 100m wide in width.
'Do-nothing' Alternative	The option to not construct the Dicoma PV Facility. The 'do-nothing' alternative assumes that the site remains in its current state, that is status quo, and that the current land use practises only continue.

[28] The LILO corridor intersects with several existing parallel Eskom power lines(Watershed-Sephaku 1 132kV, Dudfield–Watershed 2 88kV, Dudfield-Watershed 1 88kV and Watershed-Klerksdorp North 1 132kV). Therefore, should the connection to the Delareyville Munic–Watershed 1 88kV not be technically feasible, connection to the above mentioned power lines would still be within the assessed LILO corridor and considered feasible through the construction of a shorter LILO connection.

9.4 Exclusion of specialist studies during the EIA Phase

During the Scoping Phase the environmental features and sensitivities of the project site were fully identified and considered in terms of their sensitivity. The following studies have, therefore, being considered by specialists to not be required to be assessed further in the EIA phase:

» *Freshwater features*

The DFFE Screening Tool (refer to **Appendix J)** identified the aquatic biodiversity sensitivity of the project site as being very high. However, following a desktop mapping exercise and a field survey undertaken by the Ecological Specialist in June 2021 (refer to **Appendix D**) it was confirmed that no freshwater resource features are located within the project site or within close proximity to the site. No surface freshwater resource features will, therefore, be impacted by the development, and as such further assessment of freshwater resource features (during the EIA phase) will not be necessary.

» *Cultural Landscape*

Based on the findings of the heritage screening report (refer to **Appendix G**), which included the consideration of the cultural landscape, the area proposed for development has not been identified as part of a special or recognised cultural landscape and, as such, no further assessment of impacts to the cultural landscape (during the EIA Phase) is recommended or considered necessary. This is in line with the low sensitivity rating for cultural heritage as per the DFFE Screening Tool (refer to **Appendix J**)

9.5 Specialist Assesssments to be undertaken during EIA Phase

A summary of the aspects which require further investigation within the EIA phase through specialist studies, as well as the proposed activities to be undertaken in order to assess and ground-truth the significance of the potential impacts is provided within **Table 9.1**. The specialists proposed to undertake detailed studies in the EIA Phase are also reflected within this table. These specialist studies will consider the development footprint proposed for the PV facility and all associated infrastructure, as well as feasible and reasonable alternatives identified for the project. The terms of reference for each specialist includes the following:

Table 9.1: Impacts requiring further investigation during the EIA Phase, and activities to be undertaken in order to assess the significance of these potential impacts relevant to Dicoma PV

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Ecology (Flora and Fauna)	This Terrestrial Biodiversity (Fauna and Flora and Terrestrial Habitat) Assessment will be conducted in accordance with the protocols and procedures (3(a-d)) as set out in Section 24(5)(a) and (h) of the National Environmental Act, 1998, which was gazetted in March 2020. ***Sensitivity Analysis and EIA assessment*** The main aspects of an ecosystem that need to be incorporated in a sensitivity analysis include the following: » Describing the nature and amount of species present, taking into consideration their conservation value as well as the probability of such species to survive or re-establish itself following disturbances of various magnitudes » Identifying the species or habitat features that are 'key ecosystem providers' and characterising their functional relationships » Determining the aspects of community structure that influence function, especially aspects influencing stability or rapid decline of communities » Assessing key environmental factors that influence the provision of services » Sensitivity mapping » Sensitivity ratings assigned and reasoning will be clearly defined. ***Assessment of Impacts for the EIA*** The methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts associated with an activity. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive). The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme*** For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.	Gerhard Botha (Nkurenkuru Ecology & Biodiversity)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Avifauna	An avifauna impact assessment report will be compiled and be informed by the results of two seasons of avifauna monitoring, conducted in line with the Best Practise guidelines for bird monitoring for solar facilitates in South Africa. ***Sensitivity Analysis and EIA assessment*** The following activities are proposed during the EIA Phase: » Consider the findings of a summer-season as well as a winter-season avifaunal survey against the planned infrastructure within the development footprint. » The following methods are proposed during an austral summer season survey: • Active searching and the compilation of a bird inventory while traversing much of the available habitat types; • The determination of the occurrence of Red Data species and collision-prone bird species; • The identification and mapping of suitable habitat for species of conservation concern while focussing on structural and topographical cues; • A landscape analysis of important flyways or daily flight paths corresponding to important landscape features; and • Density estimates will be collected by means of point counts to evaluate the dominant/typical species and their respective relative densities at each site. » Provide an assessment of cumulative impacts associated with the development of the project site. Including an assessment of the extent of habitat lost to solar energy development in the area to date, and the likely future potential loss from the current as well as other proposed developments in the area. » Evaluate, based on the site attributes and final layout of the proposed development, what the most applicable mitigation measures to reduce the impact of the proposed development on the project site would be, and if there are any areas where specific pre-cautions or mitigation measures should be implemented. Particular attention will be paid to potential impacts on important landscape features in the vicinity of the site or where sensitive avifaunal species may nest or roost. » Identifying the species or habitat features that are 'key ecosystem providers' and complete sensitivity mapping » Sensitivity ratings assigned and reasoning will be clearly defined. ***Assessment of Impacts for the EIA*** This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of criteria including extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).	Lukas Niemand (Pachnado Consulting)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme*** For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.	
Soils, Land Use, Land Capability and Agricultural Potential	The soils impact assessment will include the consideration of aspects related to agricultural aspects in accordance with the protocols and procedures of GN 320 of 2020. ***Sensitivity Analysis and EIA assessment*** The following activities are proposed during the EIA Phase: » Soil and agricultural survey all proposed infrastructure. The survey will include soil classification according to the Soil Classification: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018). It will also include the collection of soil samples for analysis of soil texture, organic carbon, pH and major cations. » The landowners and/or land users will be consulted individually for discussion of the productivity and employment data associated with the areas that will impacted by the proposed development. The discussion will also address the limitations and risks of livestock production in the area in order to compare it to renewable energy production. » Assess the impacts identified in light of the site-specific findings and the final layout to be provided by the developer. » Appropriate mitigation measures as far as the disturbance of agricultural practices is concerned. ***Assessment of Impacts for the EIA*** The methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive). The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme***	Marine Pienaar (TerraAfrica)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.	
Visual impact	***Sensitivity Analysis and EIA assessment*** The Visual Impact Assessment study to be undertaken in the EIA phase will include a level 3 assessment which includes: » Determine Visual Distance/Observer Proximity to the facility - The proximity radii (calculated from the boundary lines of the facility). » Determine Viewer Incidence/Viewer Perception - Identify areas of high viewer incidence and to classify certain areas according to the observer's visual sensitivity towards the proposed facility and its related infrastructure. » Determine the Visual Absorption Capacity (VAC) of the landscape - The VAC is primarily a function of the vegetation, and will be low if the vegetation is, low growing sparse and patchy vegetation. » Determine the Visual Impact Index - The site-specific issues and potential sensitive visual receptors will be measured against this visual impact index and be addressed individually in terms of nature, extent, duration, probability, severity and significance of visual impact. » Identification and assessment of all potential impacts (direct, indirect and cumulative) identified in this scoping phase report and; » Recommendations will be made for the management of identified impacts. ***Assessment of Impacts for the EIA*** This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive). The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme*** For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.	Lourens du Plessis (LOGIS)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
Heritage (Archaeology and Palaeontology)	As part of the EIA, it is necessary to undertake a Heritage, Archaeological, and Palaeontology Study to fulfil the SAHRA requirements in accordance with the National Heritage Resources Act (Act No 25 of 1999). A Heritage, Archaeological, and Palaeontology Impact Assessment will therefore be conducted, the primary objective of which is to determine the heritage and archaeological significance of features on the site, as well as the surroundings. ***Sensitivity Analysis and EIA assessment*** The following activities will be undertaken during the EIA Phase: » The Archaeological Impact Assessment will be reviewed, assessed and collated as part of an Integrated Heritage Impact Assessment Report in terms of the likely impact of the development and the significance thereof to the identified archaeological heritage resources, including archaeological sites, graves and cemeteries and historic farmsteads and cultural landscapes. » The Palaeontological Impact Assessment will be reviewed, assessed and collated as part of an Integrated Heritage Impact Assessment Report in terms of the likely impact of the development and the significance thereof to the identified paleontological resources. The following activities will be undertaken for the Archaeological assessment during the EIA Phase: » Consideration of buffers recommended as part of previous environmental and heritage authorisations. » Identification of graves that may not yet be identified. » Recommend appropriate mechanisms for dealing with chance finds of human remains. » Site inspection of areas within the development footprint which have not been surveyed in order to determine the type, quantity, location and significance of the resources which may be impacted. » Propose mitigation for heritage resources that may require mitigation in the form of recording and/or sampling if it is not possible to avoid them. » Assess the impacts identified in light of the site-specific findings and the final layout to be provided by the developer. » Recommend measures to adequately address of mitigate any identified impacts. ***Assessment of Impacts for the EIA*** The methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).	Jenna Lavin (CTS Heritage)

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme*** For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr, as well as a chance finds procedure.	
Social	***Sensitivity Analysis and EIA assessment*** The specialist study to be undertaken in the EIA phase will include: » Describing and obtaining an understanding of the proposed development (type, scale, location), the communities likely to be affected and determining the need and scope of the SIA » Collecting baseline data on the current social environment and historical social trends » Interview directly affected and adjacent landowners, and key stakeholders to obtain primary information related to the project site, social environment, and to gain their inputs on the proposed project and its perceived social impact (positive and /or negative). » Assess impacts identified for the project in terms of their nature, extent, duration, magnitude, probability, status, and significance; as well as the degree to which the impact can be reversed, may cause irreplaceable loss of resources, and can be mitigated. » Identify mitigation measures with which to reduce negative impacts and enhance positive impacts for inclusion in the Environmental Management Programme (EMPr). As far as possible, the mitigation hierarchy of "avoid, minimise, and reduce" will be followed in the mitigation of potential negative impacts. » Identify any conditions for inclusion in the Environmental Authorisation (EA). » Provide a reasoned opinion regarding the acceptability of the project. ***Assessment of Impacts for the EIA*** This methodology described above assists in the evaluation of the overall effect of a proposed activity on the environment. It includes an assessment of the significant direct, indirect, and cumulative impacts. The significance of environmental impacts is to be assessed by means of the criteria of extent (scale), duration, magnitude (severity), probability (certainty) and direction (negative, neutral or positive).	Nondumiso Bulunga (Savannah Environmental) And Tony Barbour

Issue	Activities to be undertaken in order to assess significance of impacts	Specialist
	The nature of the impact will be defined and described. It will refer to the causes of the effect, what will be affected, and how it will be affected. For each anticipated impact, recommendations will be made for desirable mitigation measures. ***Environmental Management Programme*** For each overarching anticipated impact, management recommendations for the design, construction, and operational phase (where appropriate) will be drafted for inclusion in the project EMPr.	

9.6 Assessment of Potential Impacts Associated with the Project

Direct, indirect and cumulative impacts of the above issues, as well as all other issues identified will be assessed in terms of the following criteria:

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

The **significance** is determined by combining the criteria in the following formula:

S= (E+D+M) P; where

S = Significance weighting

E = Extent
D = Duration
M = Magnitude
P = Probability

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

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area).
- 30 – 60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

The project applicant has the responsibility to avoid and / or minimise impacts as well as plan for their management (in terms of the 2014 EIA Regulations (GNR 326)), the mitigation of significant impacts will be discussed. Assessment of mitigated impacts will demonstrate the effectiveness of the proposed mitigation measures.

The results of the impact assessment studies and other available information will be integrated by the Savannah Environmental project team. The EIA Report will be compiled in terms of the requirements of the 2014 EIA Regulations (GNR 326) and will include:

- The details and expertise of the EAP who prepared the report.
- The location of the activity and a locality map illustrating the location of the proposed activity.
- A description of the scope of the proposed activity including all listed activities triggered and a description of associated structures and infrastructure.
- The policy and legislative context within which the development is located and an explanation of how the development complies and responds to the legislation and policy context.
- The need and desirability of the proposed development of the activity in the context of the preferred location.
- A motivation for the preferred development footprint within the approved site.
- A description of the process followed to reach the proposed development footprint within the approved site, including:
  - Details of the development footprint considered.
  - Details of the public participation process undertaken in terms of Regulation 41 of the 2014 EIA Regulations, including copies of supporting documents.
  - A summary of issues raised by interested and affected parties and the manner in which the issues were incorporated.
  - The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
  - The impacts and risks identified including the nature, significance, consequence extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed or mitigated.
  - The methodology used for determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.

- Positive and negative impacts that the activity and alternatives will have on the environment and the community.
- Possible mitigation measures to be applied and the level of residual risk.
- A motivation for not considering alternative development footprint.
- A concluding statement indicating the preferred alternative development footprint.
- A full description of the process followed to identify, assess and rank impacts of the activity and associated infrastructure on the preferred location including all environmental issues and risks that have been identified and an assessment of the significance of each issue and risk and the extent to which the issue/risk can be avoided or mitigated.

» An assessment of the identified potentially significant impacts and risks.
» A summary of the findings and recommendations of any specialist report and an indication as to how these findings and recommendations have been included.
» An environmental impact assessment containing a summary of key findings, an environmental sensitivity map, and a summary of the positive and negative impacts and risks of the proposed activity.
» Recommendations from specialist, the recording of proposed impact management objectives and the impact management outcomes for inclusion in the EMPr as well as inclusion as conditions of authorisation.
» The final alternatives which respond to the impact management measures, avoidance and mitigation measures identified.
» Any aspects which were conditional to the findings of the assessment.
» A description of the assumptions, uncertainties and gaps in knowledge relating to the assessment and mitigation measures proposed.
» An opinion as to whether the proposed activity should or should not be authorised and the conditions thereof.
» An undertaking or affirmation by the EAP in relation to the correctness of the information, the inclusion of comments and inputs from stakeholders and Interested and affected parties, the inclusion of inputs and recommendations from the specialists, 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 or affected parties.

The EIA Report will be released to the public and relevant stakeholders, Organs of State and Authorities for a 30-day review period. Comments received from I&APs will be captured within a Comments and Response Report, which will be included within the EIA Report, for submission to DFFE for decision-making.

9.7 Authority Consultation

Consultation with the regulating authorities (i.e. DFFE and North West DEDECT) will continue to be undertaken and will continue throughout the EIA process. On-going consultation will include the following:

» Submission of a Scoping Report following the 30-day public review period (and consideration of comments received).
» Submission of an EIA Report for review and comment.
» Submission of a EIA Report following a 30-day public review period (and consideration of comments received).
» Consultation and a site visit with DFFE in order to discuss the findings and conclusions of the EIA Report, if required

9.8 Public Participation Process

A public participation process will be undertaken by Savannah Environmental during the EIA phase. The Public Participation will be undertaken in line with the approved Public Participation Plan as per the correspondence from DFFE (**Appendix C**). Consultation with key stakeholders and I&APs will be on-going throughout the EIA Phase. Through this consultation process, stakeholders and I&APs will be encouraged to verify that their issues were recorded in the Scoping Phase, and to identify additional issues of concern or highlight positive aspects of the proposed project, and to comment on the findings of the EIA Phase. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

- Focus group meetings (pre-arranged and I&APs invited to attend) via the use of virtual platforms (Zoom or MS Teams).
- One-on-one consultation meetings (for example with directly affected and surrounding landowners) via telephone or virtual platforms.
- Telephonic consultation sessions (consultation with various parties from the EIA project team).
- Written, faxed or e-mail correspondence.

The EIA Report will be made available for a 30-day review period prior to finalisation and submission to the DFFE for decision-making. In order to provide an overview of the findings of the EIA process and facilitate comments, a public meeting will be held during this public review period, depending on the specific needs of the stakeholders in the area. All comments received during the public review period will be included within the final report to be submitted to the DFFE for review and decision-making.

9.9 Key Milestones of the Programme for the EIA

The envisaged key milestones of the programme for the EIA Phase are outlined in the following table (and include indicative dates):

Key Milestone Activities	Proposed timeframe[36]
Make Scoping Report available to the public, stakeholders and authorities (30 days)	15 October 2021 – 15 November 2021
Finalisation of Scoping Report, and submission of the Final Scoping Report to DFFE	November 2021
Authority acceptance of the Final Scoping Report and Plan of Study to undertake the EIA (43 days)	Within 43 days of receipt of the Final Scoping Report
Make EIA Report and EMPr available to the public, stakeholders and authorities (30 days)	February 2022
Finalisation of EIA Report, and submission of the Final EIA Report to DFFE	March 2022
Authority review period and decision-making (107 days)	Within 107 days of submission of the Final EIA Report to the DFFE

[36] Indicative dates.

CHAPTER 10: REFERENCES

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8330	AIA Phase 1	Francois P Coetzee	01/03/2008	Cultural Heritage Survey of the PPC Slurry Operation, near Zeerust, North West Province
8455	HIA Phase 1	Udo Kusel	25/07/2008	Cultural Heritage Resources Impact Assessment of Portion 151 of Lichtenburg Town and Townlands 27 IP (Lichtenburg Extension 10) North West Province
8531	HIA Phase 1	Johnny Van Schalkwyk	01/11/2008	Heritage Impact Report for the Proposed 88 kV Power Line from Watershed Substation, Lichtenburg, to the Mmabatho Substation, North West Gauteng Province
50047	HIA Phase 1	M Hutten	01/05/2012	Heritage Impact Assessment for the Proposed Lichtenburg Solar Park North of Lichtenburg, North West Province
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