

PROPOSED 132KV POWER LINE FROM THE PROPOSED LETHABO PV PLANT TO  
THE EXISTING RWB LETHABO SUBSTATION WITHIN METSIMAHOLO LOCAL  
MUNICIPALITY UNDER FEZILE DABI DISTRICT FREE STATE



**PREPARED FOR**





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| <b>Report Name:</b>        | <b>Basic Assessment Report for the proposed 132kV power line from the proposed Lethabo PV Plant to the existing Lethabo RWB substation within Metsimaholo Local Municipality under Fezile Dabi District Free State</b>   |
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This document presents the Draft Basic Assessment Report for the 132kV power line from the Lethabo PV Solar Plant to the Lethabo RWB substation. The information and assessment presented are based on the information supplied by the 'applicant,' Eskom, environmental baseline data collected during the field surveys, Specialist assessments/ studies conducted from February to date, and stakeholder opinion.

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DIGES Group has prepared this report in fulfillment of Section 24 (5) of NEMA and its associated Regulations, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client, Eskom. No other warranty expressed or implied is made as to the professional advice included in this report. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by DIGES Group for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report assume that all relevant information has been supplied by those bodies from whom it was requested. Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. This work has been undertaken in accordance with the EIA Regulations, GNR326 of 7 April 2017 (as amended).

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## EXECUTIVE SUMMARY

### A. BACKGROUND

The initial objective of the 75MW Lethabo Solar Photovoltaic (PV) Power Plant and associated powerline authorized (14/12/16/3/3/2/753) by the Department of Forestry, Fisheries, and the Environment (DFFE) in 2016 was to encourage Eskom Holdings SOC Ltd's diversification of their energy mix at the Lethabo Power Station. The powerline authorized would evacuate electricity from the Solar PV Plant to the Power Station. However, due to the high electricity demand and to alleviate load-shedding, Eskom decided to evacuate the electricity generated from the proposed Lethabo Solar PV Plant to the grid. The infrastructure needed to evacuate electricity entails an 88kV powerline and an additional 88kV bay, with busbar and control plant extensions at the existing Rand Water Board (RWB) Lethabo Substation. Although 88kV is the required powerline capacity, Eskom plans to build the line at 132kV to accommodate future needs.

The proposed infrastructure trigger listed activities per the National Environmental Management Act, 1998 (NEMA), Environmental Impact Assessment Regulations Government Notice R326 of 2017, and Listing Notices 1 and 3 (GNR 327 and GNR 324), respectively. Eskom has therefore appointed DIGES Group cc (DIGES) to lodge an application for the Environmental Authorization for:

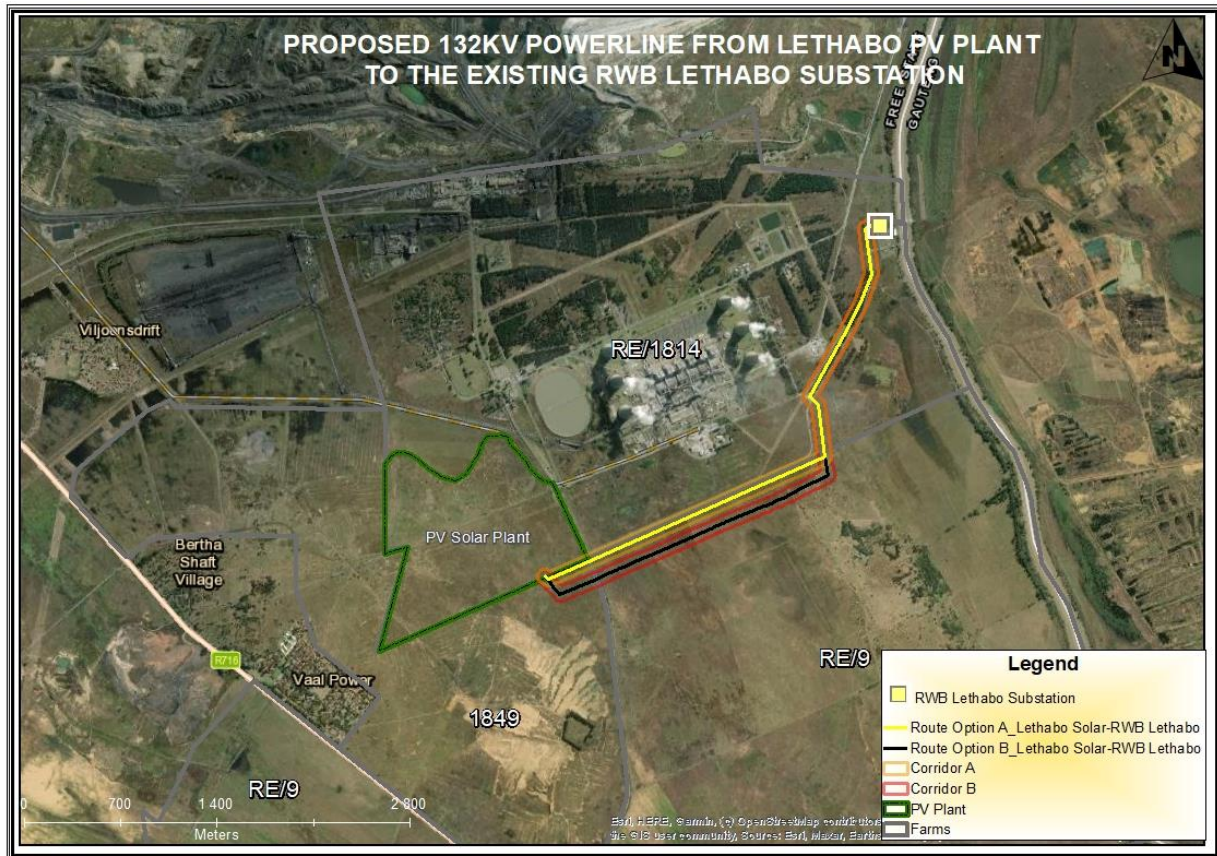
- i. ±4.5km, 132 kV powerline, operated as an 88kV powerline, from the Lethabo Solar PV Plant to the existing Lethabo Rand Water Board (RWB) substation.
- ii. 1x additional 88kV bay, inclusive of busbar extension and control plant extension at the existing Lethabo RWB Substation.

### Location

The project area is in the Free State Province, within the Metsimaholo Local Municipality, adjacent to the Provincial boundary between Gauteng and the Free State. It is near the Lethabo Power Station and within a 20km radius of Sasolburg and Vanderbijlpark. The power line and associated infrastructure will occur on the following farms:

- i. Remainder Portion of Bankfontein No. 9
- ii. Bankfontein No. 1849.
- iii. Remainder Portion of Lethabo Power Station No. 1814

Powerlines characterise the general project area due to its proximity to the Lethabo Power Station and Lethabo RWB substation. As such, the two powerline corridor alternatives assessed are in proximity and parallel to existing 22 and 88kV powerlines. Each corridor is 100 m wide, and they overlap from the Lethabo RWB substation and then deviate into separate directions at the bend point where Corridor A and Corridor B become distinct. Reference is made to the map overleaf.



### Project Location

#### B. BASIC ASSESSMENT

Eskom Holdings SOC Ltd, therefore, appointed DIGES Group cc to carry out the Basic Assessment Process as per Regulation 19, 39 to 44 and Appendix 1 of the EIA Regulations, GNR 326 of 2017 as amended.

#### C. ASSUMPTIONS AND LIMITATIONS

In undertaking this Basic Assessment (BA), the following assumptions have been considered:

- It is assumed that Eskom has provided adequate details concerning the construction and operation activities.
- The information regarding land ownership is correct, and all the affected landowners have been identified.
- It is assumed that the specialists' reports are factual and correctly indicate the environment and how the project activities will impact these resources.
- It is also assumed that the public participation is adequate and has identified all the Interested and Affected Parties.

#### D. SPECIALIST STUDIES

Taking into account the project alternatives and the nature of the environment, potential environmental impacts were identified through an internal process based on similar developments, site visits and the Screening Report. Specialist studies were therefore commissioned to gain an in-depth understanding of the status quo of various aspects of the environment and how the development will have an impact on these environmental aspects. The results of these studies serve as a basis to identify the potentially significant impacts expected should the development be undertaken. Noise, waste, land use, air quality and land capability while important are likely to be less significant; hence specialist assessments were not done. As the proposed routes are linked to the authorized Lethabo Solar Photovoltaic Plant, specialists' assessments undertaken during the Environmental Impact Assessment for the plant were also considered. This report includes the specialist impact assessment reports commissioned as part of the environmental process and summaries of the Avifauna, Archaeological, Hydrological, Paleontology, Terrestrial Biodiversity (inclusive of flora and fauna) and Wetland Assessments are given below:

- A. **Avifauna:** The habitat within which the Project Area Of Influence (PAOI) is located is considered to have a MODERATE to LOW sensitivity. In recent years, anthropogenic impacts, mostly in the form of industrial, urban, and peri-urban transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the 132kV power line, bay and busbar extensions within the RWB Substation will result in impacts of MODERATE-LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. Power line route alignment Option A is nominated as the preferred power line route alignment as it is located directly adjacent to the service road. The displacement impact is likely to be less significant along this alignment, given the existing levels of disturbance associated with the vehicle traffic on this road. However, neither option is fatally flawed, and the power line can be constructed and operated along either of the proposed options, with appropriate mitigation. The full report is attached in Appendix E-2.
- B. **Archaeological:** Archaeological sites dating to the Stone, Iron, and Historical Age are known to occur in the region of the study area, however, none of those were documented during the survey. Corridor alternative one transverse adjacent to an existing powerline(s) and close to the road. As a result, there are no major heritage materials expected here. The second alternative deviates from the first and runs close to the first alternative meaning the area of the second alternative is equally disturbed. It should also be taken into account that there was no subsurface inspection, as a result, it might be possible that specific aspects related to construction might have a direct disturbance on subsurface heritage resources, which in turn may result in irreplaceable loss of heritage resources. Due to its proximity to the road and existing line, Corridor Alternative One is therefore nominated as the preferred alternative. The full report is attached in Appendix E-4.

- C. **Hydrology:** The Lethabo powerline is situated within the C22F quaternary catchment, which receives runoff from contributions from the upstream catchments C22E, C22G, and C22L. The primary river within the site catchment is the Vaal River, which is fed by the Vaal Dam located upstream. These peak flows were utilized for hydraulic modelling as input flows within the HEC-RAS model. The recommended flood peaks for the 1:50-year and 1:100-year flood events were 1336.06 and 2070.71 cubic meters per second, respectively. Although the project poses potential environmental risks, it is unlikely to result in significant impacts on the receiving watercourse. It is recommended that any future additional infrastructure should be located outside the modelled 1:100-year floodlines from the edge of the Vaal River. From a hydrological assessment, both corridors are viable as they do not fall within the 1:50-year and 1:100-year floodlines. The full report is attached in Appendix E-5.
- D. **Paleontology:** The proposed routes lie on the potentially fossiliferous early Permian Vryheid Formation in the western half and on the moderately fossiliferous Quaternary sands and alluvium in the eastern half. No fossils have been recorded from this site and it appears to have been cleared for agriculture in the past. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or drilling for pole foundations have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised. Monitoring of the excavations for pole foundations in the western half is recommended. The full report is attached in Appendix E-6.
- E. **Terrestrial Biodiversity:** The proposed site is situated within Central Free State grassland, which is not considered to be vulnerable however, the Free State Biodiversity Conservation Assessment classifies the study area as Ecological Support Areas 1 and 2. No threatened plant species were confirmed during fieldwork and no Near Threatened and protected species were recorded. In total, 23 plant species were recorded from the proposed corridors. No threatened fauna species were recorded. The findings of the field assessment indicate that the vegetation within the two alternative corridors is transformed, with low plant species richness and no red data plant species present. The terrestrial habitat associated with the study area is of low to intermediate sensitivity. Widespread anthropogenic impacts from current use and some levels of alien and invasive plant proliferation have degraded the available floral habitat associated with the site. Both corridors are viable as there are no significant impacts associated with the development of any of the proposed corridors that cannot be reduced to a manageable level through mitigation. The full report is attached in Appendix E-3.
- F. **Wetlands Delineation:** The Wetlands identified are moderately transformed and impacted by historical and ongoing anthropogenic activities. Wetland B is a small-scale wetland unit that interconnects to a larger wetland system to the south (Wetland A). The wetland located near the

power station (Wetland C) was determined to be historically impacted by the construction and operation of the power station and associated stormwater infrastructure. The Present Ecological Status (PES) for wetlands B & C (seeps) scored moderate and high for wetland A (floodplain) respectively. The Ecological Importance and Sensitivity (EIS) falls in the mid-range and has high functionality in respect of hydrological functions. The Recommended Ecological Category (REC) for the wetlands were categorised as moderate. The impact assessment showed that the proposed powerline would minorly impact the identified wetlands. Both corridors are viable since they are located within the same environment, and as such, there is no advantage or disadvantage in proceeding with any of the two alternatives. The full report is attached in Appendix E-7

### **PUBLIC PARTICIPATION PROCESS (PPP)**

In addition to the Public Participation information undertaken in 2016 for the Solar Plant, a reconnaissance site visit was undertaken to develop an understanding of the social context (representative structures; language; communication media, etc.). The outcome of this site visit was that information to the communities in the receiving environment would be first distributed via leadership structures that are available in these communities, namely the ward councillor and committees. This structure would also assist in setting up public meetings. Interested and Affected Parties (IAPs) were identified, and these are currently registered on the database. The database submitted with this report includes stakeholders from:

- National, Provincial and Local Government.
- Landowners.
- Non-Governmental Organizations.

The Background Information Document and notifications were sent to stakeholders indicating via emails and site notices were placed in conspicuous places such as the municipal, district offices, library and Eskom visitors center. Advertisements were also placed in the Sowetan the Vaalweekblad newspapers notifying the public about the project, the date and venue for a public meeting, and the availability of the Draft Basic Assessment Report.

This report will be submitted to all stakeholders for a 30-day review period. All comments will be recorded and responded to accordingly. Comments concerning way leaves and requests for the spatial data (location of routes) were requested by Randwater and Telkom. This information will be made available to them with the draft Basic Assessment Report.

### **PROCEDURE FOR THE REMAINDER OF THE STUDY**

The following activities will be carried out during the finalization of the application:

- Comments from IAPs (public, Stakeholder Departments and Department of Forestry, Fisheries and the Environment (DFFE)) will be incorporated into the final BAR.



- Submission of the final report to DFFE for review and decision-making.
- Stakeholders will get written notice of DFFE's decision and instructions on how to appeal it within the specified deadlines.

## **ENVIRONMENTAL IMPACT STATEMENT AND RECOMMENDATIONS**

This Basic Assessment has shown that the proposed project will result in negative impacts; however, when mitigated adequately, these impacts will result in low residual impacts. It has also shown that there will be positive impacts, such as the creation of employment opportunities, a boost in the local economy, and a positive step in achieving the targets set for the utilisation of clean (renewable) energy. It should also be noted that Lethabo Solar Plant has been authorized, and a line is required to evacuate electricity from the Lethabo Solar Plant to the grid, through the Lethabo RWB substation.

The avifauna, biodiversity, heritage, palaeontology and wetland specialists' assessments have concluded that the project is viable should all the mitigation measures stated be effectively implemented. In the interest of sustainable development, the specialists' recommendations and my professional experience on related projects, I, as an Environmental Assessment Practitioner (EAP), recommend Corridor 1, associated infrastructure and the additional 88 kV bay at Lethabo RWB Substation be authorized subject to the following recommendations being included in the Environmental Authorization:

- ❑ The stipulations and provisions of the attached Environmental Management Programme on Appendix G be conveyed to and familiarized by the contractor and workers responsible for construction.
- ❑ Permits required by Eskom from other competent authorities should be acquired before the commencement of the activity.
- ❑ An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with the conditions of approval.
- ❑ The recommendations of the Terrestrial biodiversity specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- ❑ If collision or electrocution impacts are recorded once the 132kV power line are operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.
- ❑ Pre-construction education and awareness training should include archaeology and palaeontology aspects.
- ❑ Construction footprints must be designated before the commencement of the construction and edge effects must be controlled from construction activities.

- ❑ All measures regarding waste management must be undertaken using an integrated waste management approach.
- ❑ Clearance of vegetation must only be done on areas earmarked to avoid disturbance of the ecosystem.

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## LIST OF ABBREVIATIONS

|        |   |
|--------|---|
| amsl   | Above mean sea level  |
| CARA   | Conservation of Agricultural Resources Act  |
| CBA    | Critical Biodiversity Areas   |
| DBAR   | Draft Basic Assessment Report   |
| DEA    | Department of Environmental Affairs   |
| DEAT   | Department of Environmental Affairs and Tourism                                       |
| DESTEA | Department of Economic, Small Business Development, Tourism and Environmental Affairs |
| DFFE   | Department of Forestry, Fisheries, and the Environment                                |
| DWA    | Department of Water Affairs   |
| DWS    | Department of Water and Sanitation  |
| DME    | Department of Minerals and Energy   |
| EA     | Environmental Authorization   |
| EAP    | Environmental Assessment Practitioner   |
| ECA    | Environment Conservation Act  |
| EIA    | Environmental Impact Assessment   |
| EMPr   | Environmental Management Programme  |
| ESA    | Ecological Support Area   |
| GDP    | Gross Domestic Product  |
| HA     | Hectares  |
| IAP    | Interested and Affected Parties   |
| IBA    | Important Bird Areas  |
| IEM    | Integrated Environmental Management   |
| kV     | kilo Volt   |
| LED    | Local Economic Development  |
| NBA    | National Biodiversity Assessment  |
| NEMA   | National Environmental Management Act (Act No. 107 of 1998), as amended               |
| NEMBA  | National Environmental Management: Biodiversity Act (Act No. 10 of 2004)              |
| NWA    | National Water Act (Act 36 Of 1998)   |

|       |  |
|-------|--|
| PAOI  | Project Area Of Influence                  |
| PP    | Public Participation                       |
| PPP   | Public Participation Process               |
| ROW   | Right of Way                               |
| SAHRA | South African Heritage Resources Authority |
| SARAO | South African Radio Astronomy Observatory  |
| V     | Volt                                       |
| WMA   | Water Management Area                      |

## DEFINITIONS

- 1 **Affected environment:** Those parts of the socio-economic and biophysical environment impacted on by the development.
- 2 **Alien Vegetation:** Alien vegetation is defined as undesirable plant growth, which shall include, but not be limited to; all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared undesirable.
- 3 **Alternatives:** A possible course of action, in place of another that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative layouts or alternative designs, alternative processes and materials. In Integrated Environmental Management, the so-called "no action" alternative may also require investigation in certain circumstances.
- 4 **Assessment:** The process of collecting, organizing, analyzing, interpreting and communicating data that is relevant to some decision.
- 5 **Bio-regional plan:** inform land-use planning and decision-making by a range of sectors whose policies and decisions impact on biodiversity.
- 6 **Conservation Areas:** are areas of land not formally protected by law but informally protected by the current owners and users; and managed at least partly for biodiversity conservation.
- 7 **Critical Biodiversity Areas (CBA1):** are areas that are.
  - Irreplaceable.
  - required to meet biodiversity pattern and/or sites that are required to meet each ecological process targets; and
  - natural and near-natural sites including some degraded areas.
- 8 **Critical Biodiversity Areas (CBA2):** these are:
  - Best design selected sites.
  - Areas selected to meet biodiversity pattern and/or sites that are required to meet each ecological process targets.
  - Alternative sites may be available to meet targets; and
  - natural and near-natural sites including some degraded areas, including areas modified by agriculture.
- 9 **Development:** The act of altering or modifying resources to obtain potential benefits.
- 10 **Ecological Support Areas (ESA1):** are areas that are natural, near natural and degraded areas supporting CBAs by maintaining the ecological processes on which CBAs depend.
- 11 **Ecological Support Areas (ESA2):** Areas with no natural habitat that is important for supporting ecological processes.

- 12 **Environment:** The external circumstances, conditions and objects that affect the existence and development of individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects.
- 13 **Environment Authorization:** A written statement from the Department of Forestry, Fisheries and Environment that records its approval of a planned undertaking and the conditions of such an approval.
- 14 **Environmental impact:** The degree of change in environmental components resulting from the effects of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organization's activities or may be indirectly caused by them.
- 15 **Environmental Impact Assessment:** A process of examining the environmental effects of a proposed development.
- 16 **Environmental issue:** A concern felt by one or more parties about some existing, potential or perceived environmental impact.
- 17 **Environmentally Sensitive Area:** An area designated in regional or local land use plans, or by a local, regional, provincial or national government body as being sensitive to disturbance or identified by an applicant as being sensitive for some reason.
- 18 **Erosion:** The process by which material, such as rock or soil, is worn away or removed by wind or water.
- 19 **Evaluation:** The process of weighing information, the act of making value judgments or ascribing values to data to reach a decision.
- 20 **Hazardous substance:** Any substance that is of risk to health and safety, property or the environment. Hazardous substances have been classified under the SANS 10228-B-The identification and Classification of Dangerous Goods and Substances'.
- 21 **Heritage Site:** A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc.
- 22 **Indigenous Vegetation:** 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.
- 23 **Integrated environmental management (IEM):** is a process of integrating environmental, Socio-economic and cultural factors in decision making to promote sustainable development. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.
- 24 **Landowner:** The individual or company that owns the land through which the servitude crosses.
- 25 **Mitigation:** the elimination, reduction or control of the adverse environmental effects of the project and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

- 26 **Monitoring Programme:** The program for observing the potential environmental effects of a project, resolving specific outstanding environmental issues, and determining the action required based on the result of these activities.
- 27 **National protected area** means-
- a) a special nature reserve.
  - b) a national park; or
  - c) a nature reserve or protected environment-
    - (i) managed by a national organ of state; or (ii) which falls under the jurisdiction of the Minister for any other reason.
- 28 **Nature reserve** means-
- (a) an area declared, or regarded as having been declared, in terms of section 23 of the National Environmental Management: Protected Areas Act, 2003, as a nature reserve; or
  - (b) an area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 23(2) of the National Environmental Management: Protected Areas Act, 2003, be declared as a nature reserve.
- 29 **No Natural Areas Remaining:** are areas without intact habitat remaining.
- 30 **Other Natural Areas:** are areas that still contain natural habitat but that are not required to meet biodiversity targets.
- 31 **Power line:** An overhead line of whatever voltage, erected for the conducting of electricity.
- 32 **Right of Way (ROW):** The strip of land acquired for which ESKOM has obtained the rights for construction and operation of the distribution line.
- 33 **Stakeholder:** A stakeholder is any group or individual that may be potentially affected by a proposed project. Stakeholders typically include elected officials, government and non-government agencies, environmental and other special interest groups, developers, educators, landowners and members of the public.
- 34 **Study Area:** The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.
- 35 **Substation:** A network of switching, interrupting and voltage-transforming apparatus for transferring power from the electrical transmission system to the local electrical distribution system for utilization by electrical customers.
- 36 **Water body:** Means a body containing water and includes dams and wetlands, whether ephemeral or permanent.
- 37 **Watercourse:** Means any river, stream and natural drainage channel whether carrying water or not.

# 1 INTRODUCTION

This section of the report details the information required as per Section 3(1)(a) to (c) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended)

**(a) details of—**

- (i) the EAP who prepared the report; and
- (ii) the expertise of the EAP, including a curriculum vitae.

**(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.
- (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.

**(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure 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;

Section 24 F (1) (a) of National Environmental Management Act (NEMA), Act 107 of 1998, indicates that no person may commence an activity listed or specified in terms of section 24(2)(a) or (b), except per the Environmental Authorisation (EA) issued for that activity. Eskom Holdings SOC Ltd (hereinafter Eskom) has appointed DIGES Group (hereinafter DIGES) to lodge an application with the Department of Forestry, Fisheries and the Environment (DFFE) for an Environmental Authorisation for the 132kV power line from the authorised Lethabo Solar Photovoltaic (PV) Plant (hereinafter Lethabo Solar Plant) to the Rand Water Board (RWB) substation within Metsimaholo Local Municipality, Fezile Dabi District Municipality, Free State Province. Based on the capacity of the power line and the receiving environment, DIGES will undertake a Basic Assessment (BA) as per the NEMA Environmental Impact Assessment (EIA) Regulations, Government Notice R 326, of 2017 (hereinafter EIA Regulations, 2017 (as amended)). The following activities are therefore being undertaken as part of the BA process:

- i. Identification of feasible alternatives and screening thereof.
- ii. Compilation of a screening report as per the DFFE Screening Tool.
- iii. Site Sensitivity Verification.
- iv. Specialists Assessment.
- v. Undertaking the Public Participation Process.
- vi. Compilation of the Draft Basic Assessment Report and Environmental Management Programme.

## 1.1 DETAILS OF ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER (EAP)

Section 13 of EIA Regulations, Government Notice R326 of 2017 as amended indicates that an Environment Assessment Practitioner (EAP) should be independent and have expertise in conducting Environmental Impact Assessments, including knowledge of the Act and any guidelines relevant to the proposed activity.

DIGES Group is a black-owned BBB-EE consultancy company established in 2004 that offers services in the geo-environmental sector. The company has completed many Environmental Impact Assessments for various developments. The details for the project EAP and compiler of this report are given below as per Section 3(1)(a)(i) of Appendix 1 of the EIA Regulations, 2017 as amended. Reference is also made to the CV attached in Appendix A.

**Table 1-1: EAP Details**

|                      |   |
|----------------------|---|
| <b>Company</b>       | <b>DIGES GROUP</b>  |
| <b>EAP</b>           | Brenda Makanza  |
| <b>Address</b>       | Building 2, Constantia Park<br>546, 16th Road<br>Midrand<br>1685  |
| <b>Telephone No.</b> | 011 312 2878  |
| <b>E-mail</b>        | <a href="mailto:brendam@diges.co.za">brendam@diges.co.za</a>  |
| <b>Expertise</b>     | <p><u>Qualification(s)</u><br/>BSc (Hons) Environmental Science,<br/>Professional Diploma GIS.</p> <p><u>Professional Registration</u><br/>SACNASP: Professional Natural Scientist<br/>EAPASA: Registered EAP</p> <p><u>Experience</u></p> <ul style="list-style-type: none"> <li>▪ 18 years of experience gained through direct involvement in several conservation initiatives.</li> <li>▪ Principal Environmental Consultant of DIGES Group, responsible for leading, administrating, and completing assessments on Environmental Impact Assessments, overseeing studies, and interpreting technical reports and appendices.</li> <li>▪ Academic skills gained through an honours-level degree in Environmental Science &amp; Health and Post Graduate Certificates in Integral Water Management and Geo-informatics, alongside the</li> </ul> |



|  |  |
|--|--|
|  | <p>proficient ability to participate in the development, design, and implementation of environmental / conservation management policies and consultation initiatives actively and valuably; thereby supporting the highest standards of Environmental Management and Sustainable Development, in all undertakings.</p> |
|--|--|

## 1.2 DETAILS OF THE APPLICANT

The details of the applicant are given in the Table below.

**Table 1-2: Applicant Details**

|                         |  |
|-------------------------|--|
| <b>Name of Company</b>  | Eskom Holdings SOC Ltd   |
| <b>Physical Address</b> | Megawatt Park, Maxwell Drive, Sunninghill, Sandton             |
| <b>Postal Address</b>   | P.O. Box 1091, Johannesburg, 2001                              |
| <b>Contact Person</b>   | Ms. Deidre Herbst  |
| <b>Email Address</b>    | <a href="mailto:HerbstDL@eskom.co.za">HerbstDL@eskom.co.za</a> |

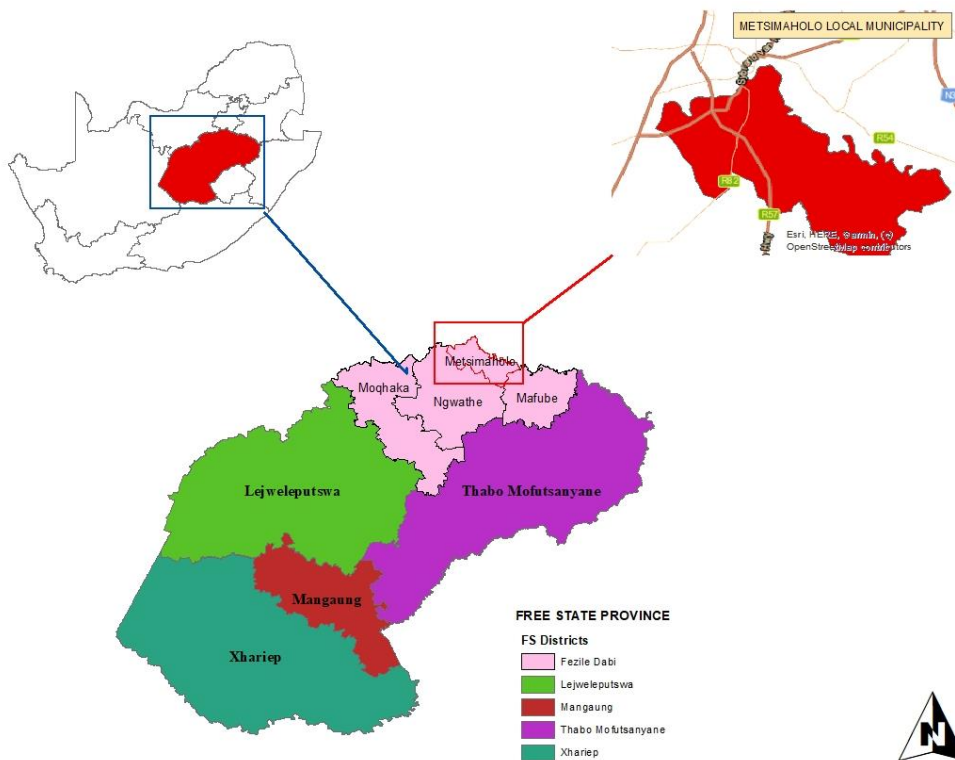
## 1.3 LOCATION

### 1.3.1 Regional Context of the Project

The project area is in the Free State Province, within the Metsimaholo Local Municipality in the vicinity of the provincial boundary between Gauteng and the Free State. The Free State shares a border with six of the nine provinces and seven districts of Lesotho. It is the third-largest province in land area (about 129 825 km<sup>2</sup>) and is divided into one metropolitan municipality and four district municipalities. One of the District Municipalities is Fezile Dabi, a Category C municipality established in 2000. The district forms the northern part of the Free State Province and borders Thabo Mofutsanyane, Lejweleputswa and shares provincial borders with 3 of the provinces: Gauteng, Mpumalanga and Northwest. The Vaal River and the Vaal Dam form the northern boundary of Fezile Dabi District Municipality and serve as the boundary between Free State and Gauteng. Although Fezile Dabi contains 17% of the Free State is the second smallest District Municipality in the Free State, covering 16.4% of the provincial area. The district consists of Moqhaka, Metsimaholo, Ngwathe and Mafube.

The Metsimaholo Local Municipality's jurisdiction is in the northern part of the Fezile Dabi District Municipality Region. The former Sasolburg, Deneysville and Oranjeville Transitional Local Councils and a section of the Vaal Dam Transitional Rural Council is included in the Metsimaholo Region. The largest

urban unit is Sasolburg, followed by Deneysville and Oranjeville. Several small villages in the vicinity of Sasolburg also form part of the Metsimaholo Region. These villages are privately managed with a legal status as a single erf, and mining-related companies administer the majority. Metsimaholo is linked to the north and south by the N1, N3, N5, R28, R42, R59, R82, R87, R551, R553, R549 and the R 716. At a local level, the municipality is connected by a series of tertiary and secondary roads. Reference is made to the regional map indicated in Figure 1-1.



**Figure 1-1: Regional Context**

### 1.3.2 Project Location

The authorized Lethabo PV Solar Energy Facility is situated on portion 1814 of Farm Bankfontein within the Mestimaholo Local Municipality, which forms part of the Fezile District Municipality. The proposed power line will be required to evacuate power generated from the Solar Plant to the existing Lethabo RWB substation north-east of the Lethabo Power Station. The alternative powerline corridors are located east of Vijoensdrif, southeast of Vereeniging, and close to Vaal River. The proposed alternative powerline corridors are situated in the broader power station property. The immediate surroundings are characterized by powerlines and heavy industrial developments such as Lethabo Power Station, open cast mining and agricultural farms, whilst Sasol Refinery is in Sasolburg. The closest towns are

Vanderbijlpark to the north of the Vaal and Sasolburg to the southwest, whilst Zamdela township is located 14km southwest of the project area. Access to the Lethabo Solar Plant is provided directly from the R716, which runs parallel to the western boundary of the proposed site, whilst access to the proposed corridors is from Dihlabakela Road to the Lethabo Ash Resources Area and RWB substation. A summary of the project location is given in the table below, and the figure overleaf shows the location.

**Table 1-2: Project Location Information**

|                                      |  |
|--------------------------------------|--|
| <b>Province</b>                      | Free State   |
| <b>District Municipality</b>         | Fezile Dabi  |
| <b>Local Municipality</b>            | Metsimaholo  |
| <b>Ward No.</b>                      | 18   |
| <b>Farms and SG 21 digits</b>        | Remainder Portion of Bankfontein No. 9- F0160000000000900000<br>Bankfontein No. 1849 - F01600000000184900000<br>Remainder Portion of Lethabo Power Station No. 1814- F01600000000181400000 |
| <b>Closest towns and Settlements</b> | Vijoensdrif<br>Sasolburg<br>Zamdela<br>Vanderbijlpark  |
| <b>Surrounding land-uses</b>         | Electricity generation<br>Mining<br>Agricultural   |

## **1.4 A DESCRIPTION AND COORDINATES OF THE CORRIDOR**

Two powerline corridor alternatives have been assessed. Corridor A refers to the corridor near the road from the proposed solar power plant, whereas Corridor B refers to the deviation of Corridor A from the existing substation. Of note is that the two corridors run parallel and between 22 and 88kV powerlines. The proposed powerline corridor alternatives run from the southwestern side of the Lethabo power station site, where the authorised Solar Plant will be located, to the substation in the northeastern part of the power station. The location of the corridors and related infrastructure is indicated in the map overleaf, and the start, mid and end coordinates for the two routes are shown in Table 1-3, whilst the coordinates at 250m intervals are given in Table 1-4.

**Table 1-3: Route Summary**

|                                    | Route Option A                         | Route Option B                         |
|------------------------------------|--|--|
| <b>Start (Lethabo Solar Plant)</b> | 26° 45' 17,278" S<br>27° 57' 58,783" E | 26° 45' 17,278" S<br>27° 57' 58,783" E |
| <b>Mid-point</b>                   | 26° 44' 51,915" S<br>27° 59' 4,191" E  | 26° 44' 56,168" S<br>27° 59' 6,178" E  |
| <b>End (RWB Substation)</b>        | 26° 43' 53,679" S<br>27° 59' 24,735" E | 26° 43' 53,679" S<br>27° 59' 24,735" E |
| <b>Length</b>                      | 4.1 km                                 | 4.3 km                                 |

**Table 1-4: Route Coordinates at 250m intervals**

| Route Option A         |                   |                   | Route Option B    |                   |
|------------------------|-------------------|-------------------|-------------------|-------------------|
| DISTANCE (m)           | LATITUDE (S)      | LONGITUDE (E)     | LATITUDE (S)      | LONGITUDE (E)     |
| Lethabo Solar PV Plant | 26° 45' 17,278" S | 27° 57' 58,783" E | 26° 45' 17,278" S | 27° 57' 58,783" E |
| 250                    | 26° 45' 15,054" S | 27° 58' 6,917" E  | 26° 45' 20,581" S | 27° 58' 5,480" E  |
| 500                    | 26° 45' 11,720" S | 27° 58' 15,171" E | 26° 45' 17,359" S | 27° 58' 13,787" E |
| 750                    | 26° 45' 8,386" S  | 27° 58' 23,424" E | 26° 45' 13,987" S | 27° 58' 22,020" E |
| 1000                   | 26° 45' 5,052" S  | 27° 58' 31,678" E | 26° 45' 10,738" S | 27° 58' 30,315" E |
| 1250                   | 26° 45' 1,717" S  | 27° 58' 39,931" E | 26° 45' 7,407" S  | 27° 58' 38,570" E |
| 1500                   | 26° 44' 58,383" S | 27° 58' 48,184" E | 26° 45' 4,045" S  | 27° 58' 46,809" E |
| 1750                   | 26° 44' 55,049" S | 27° 58' 56,437" E | 26° 45' 0,859" S  | 27° 58' 55,134" E |
| 2000                   | 26° 44' 51,714" S | 27° 59' 4,690" E  | 26° 44' 57,443" S | 27° 59' 3,339" E  |
| 2250                   | 26° 44' 48,003" S | 27° 59' 12,186" E | 26° 44' 53,786" S | 27° 59' 11,420" E |
| 2500                   | 26° 44' 39,952" S | 27° 59' 10,967" E | 26° 44' 46,759" S | 27° 59' 12,027" E |
| 2750                   | 26° 44' 32,916" S | 27° 59' 9,079" E  | 26° 44' 38,711" S | 27° 59' 10,786" E |
| 3000                   | 26° 44' 25,805" S | 27° 59' 13,457" E | 26° 44' 31,820" S | 27° 59' 9,753" E  |
| 3250                   | 26° 44' 18,682" S | 27° 59' 17,810" E | 26° 44' 24,701" S | 27° 59' 14,114" E |
| 3500                   | 26° 44' 11,397" S | 27° 59' 21,804" E | 26° 44' 17,568" S | 27° 59' 18,438" E |
| 3750                   | 26° 44' 3,635" S  | 27° 59' 23,852" E | 26° 44' 10,217" S | 27° 59' 22,256" E |
| 4000                   | 26° 43' 55,582" S | 27° 59' 22,644" E | 26° 44' 2,397" S  | 27° 59' 23,666" E |
| 4250                   |                   |                   | 26° 43' 54,488" S | 27° 59' 22,745" E |
| RWB Substation         | 26° 43' 53,679" S | 27° 59' 24,735" E | 26° 43' 53,679" S | 27° 59' 24,735" E |

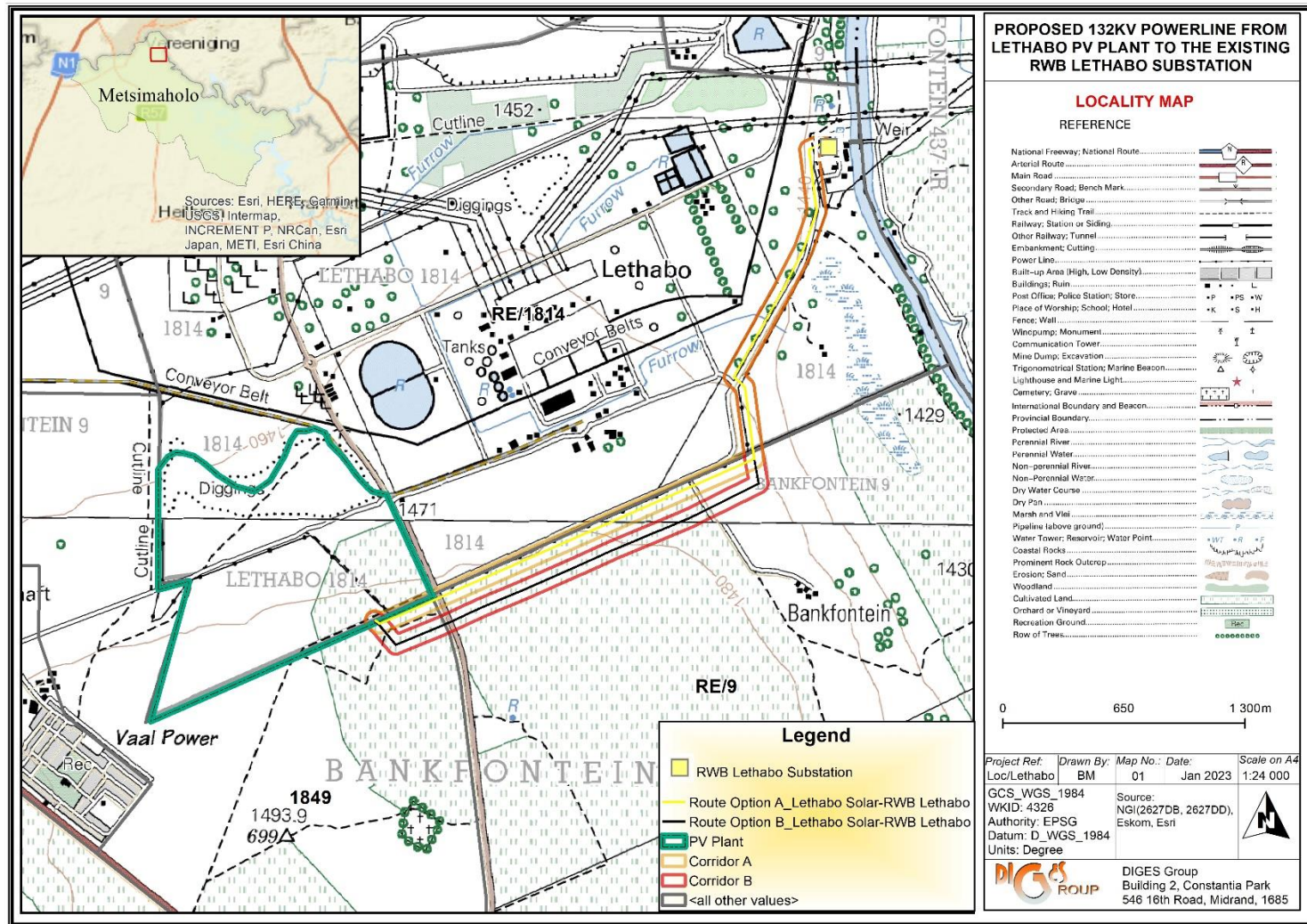


Figure 1-2: Project Location

## 2 PROJECT DESCRIPTION

This section of the report details the information required as per Section 3(1)(d) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

**(d) a description of the scope of the proposed activity, including—**

- (i) 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

### 2.1 PROJECT BACKGROUND

The initial objective of the 75MW Lethabo Solar Photovoltaic (PV) Power Plant and associated powerline authorized (14/12/16/3/3/2/753) by the Department of Forestry, Fisheries, and the Environment (DFFE) in 2016 was to encourage Eskom Holdings SOC Ltd's diversification of their energy mix at the Lethabo Power Station. The powerline authorized would evacuate electricity from the Solar PV Plant to the Power Station. However, due to the high electricity demand and to alleviate load-shedding, Eskom decided to evacuate the electricity generated from the proposed Lethabo Solar PV Plant to the grid. The infrastructure needed to evacuate electricity entails an 88kV powerline and an additional 88kV bay, with busbar and control plant extensions at the existing Rand Water Board (RWB) Lethabo Substation. Although 88kV is the required powerline capacity, Eskom plans to build the line at 132kV to accommodate future needs. Therefore, the scope of work entails:

- i. ±4.5km, 132 kV powerline from the solar PV power plant to the existing Rand Water Board substation. Two alternative corridors with a width of 100m per corridor are being assessed.
- ii. 1x additional 88kV bay, inclusive of busbar extension and control plant extension at the existing Rand Water Board (RWB) Lethabo Substation.

The works associated with the infrastructure trigger activities incorporated in Listing Notices 1 and 3 (Government Notices R327 and R 324) according to National Environmental Management Act 107 of 1998: Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017(as amended). An EA is required before the infrastructure can be constructed.

**Table 2-1: List of triggered activities**

| Relevant Government Notice                           | Activity              | Description   | Applicability   |
|--|-----------------------|---|---|
| Listing Notice 1, Government Notice No. R327 of 2017 | 11(i)                 | The development of facilities or infrastructure for the transmission and distribution of Electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.   | Construction of a 132kV powerline to be operated at 88kV until there is a future need for it. The powerline will connect the authorised Lethabo PV Plant to the existing Lethabo RWB substation. The length of the powerline will be approximately 4.5km. |
| Listing Notice 1, Government Notice No. R327 of 2017 | 19                    | The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.   | The possible excavating of more than 10 m <sup>3</sup> and infilling of wetlands with more than 10 m <sup>3</sup> of material during construction.  |
| Listing Notice 3, Government Notice R324 of 2017     | 12 (b)(iv)            | The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland."   | The clearance of 300m <sup>2</sup> of vegetation at tower positions within 100m of the delineated wetlands.   |
| Listing Notice 3, Government Notice R324 of 2017     | 14 (ii)(c)(b)(i) (ff) | (ii) The development of infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs (c) if no development setback has been adopted, within 32 metres of metres of a watercourse, measured from the edge of a watercourse in (b) Free State, (i) Outside urban areas, (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans | The proposed corridors are within ESA 1 and 2, and the cumulative area of the towers that will be placed within 32m of wetlands exceeds 10 square metres.   |

As the powerline is associated infrastructure of the Lethabo Solar PV Plant, the Scoping and Environmental Impact Assessment Report and associated specialist reports undertaken for the Solar PV Plant have been referenced.

## 2.2 TECHNICAL DETAILS OF THE PROJECT

### 2.2.1 Requirements for the 132kV Power line

The technical requirements for a 132kV power line are discussed in the Sections below.

**Table 2-1:** Technical Details

| Component                | Description/dimensions   |
|--------------------------|--|
| Power line capacity      | 132kV  |
| Height of Towers         | 17m- 24m   |
| Span Length              | 300m-400m  |
| Minimum Ground Clearance | 6.7m   |
| Length                   | ±4.5 km  |
| Servitude                | 60m<br>A section of route (A) runs parallel<br>22kV and 88kV power lines |

#### 2.2.1.1 Line Height and Servitude width

The statutory minimum ground clearance for a 132kV overhead line is 6.7m. The line must be designed to afford this clearance in ALL circumstances. The overall height of the line is also dependent on several criteria, including geographical location, topography, height above sea level, span length and conductor type. The servitude width required for a 132kV distribution line is 31 m (i.e., 15.5 m on either side measured from the centre line of the powerline). The minimum vertical clearance to buildings, poles and structures not forming part of the power line must be 3.8 m, while the minimum vertical clearance between the conductors and the ground is 6.7 m. The minimum distance of a 132kV powerline running parallel to proclaimed public roads is 95 m from the powerline servitude's centerline to the road servitude's centreline. The minimum distance between trees or shrubs and any bare phase conductor of a 132kV distribution line must be 4 m, allowing for the possible sideways movement and swing of both the distribution line and the tree or shrub.

#### 2.2.1.2 Minimum Clearance Distances

For safety reasons (as set out in regulations of the Occupational Health and Safety Act), the distribution line requires minimum clearance distances. These are summarized as follows:



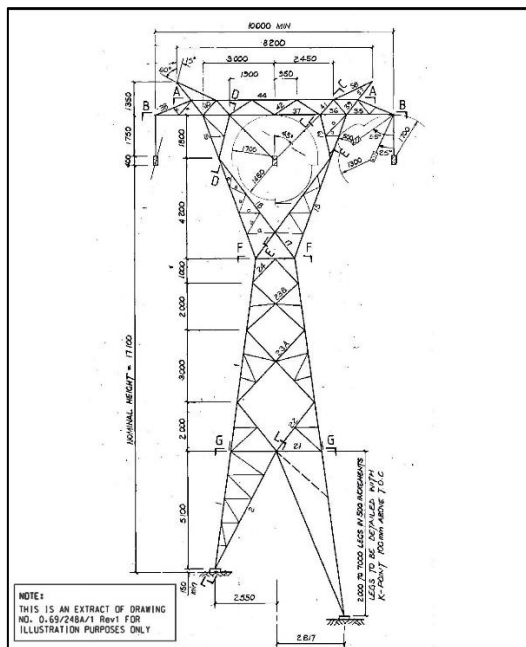
- i. The minimum vertical clearance distance between the ground and power line conductors is 8.1 m;
- ii. The maximum crop height permitted within the servitude is 4.3 m;
- iii. The minimum vertical clearance to any fixed structure that does not form part of the power line is 5.6 m;
- iv. The minimum safe distance required from the centre of the power line to the edge of a domestic house is 40 – 50 m.
- v. Farming activity, except for sugarcane and commercial forestry, can be practised under the conductors, provided that there is adherence to safe working clearances, crop height restrictions and building restrictions.

### 2.2.1.3 Span Length

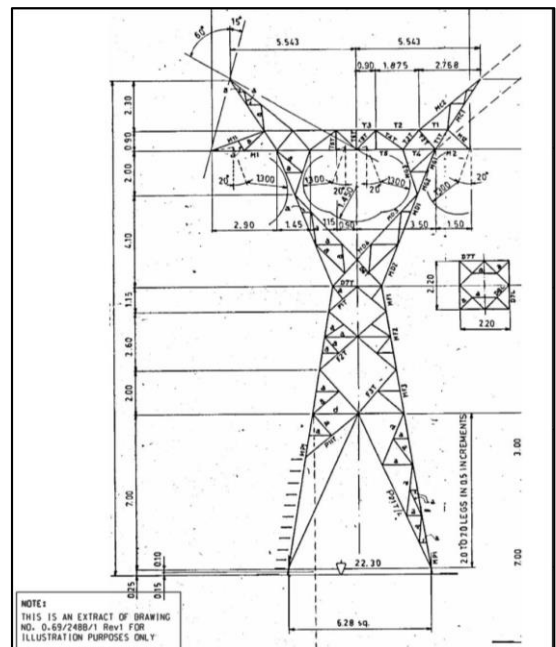
The span length also depends on the same criteria as line height. The distance between supports (span length) will vary from 300 to 400m, with an average span of 350m between supports.

### 2.2.1.4 Towers

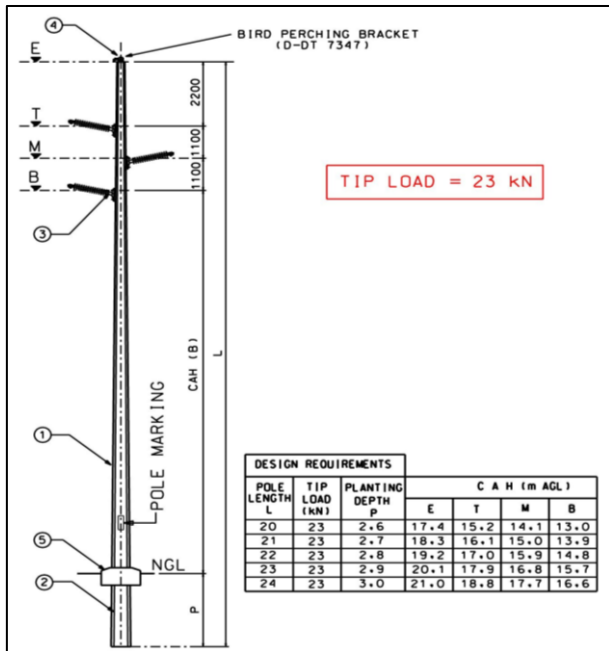
Steel towers will be constructed at intervals along the route of the distribution line at a spacing of approximately 300 - 400 m. The towers being considered are indicated below, with heights ranging from 17-24m. The final towers to be used will be determined after surveying and profiling the line.



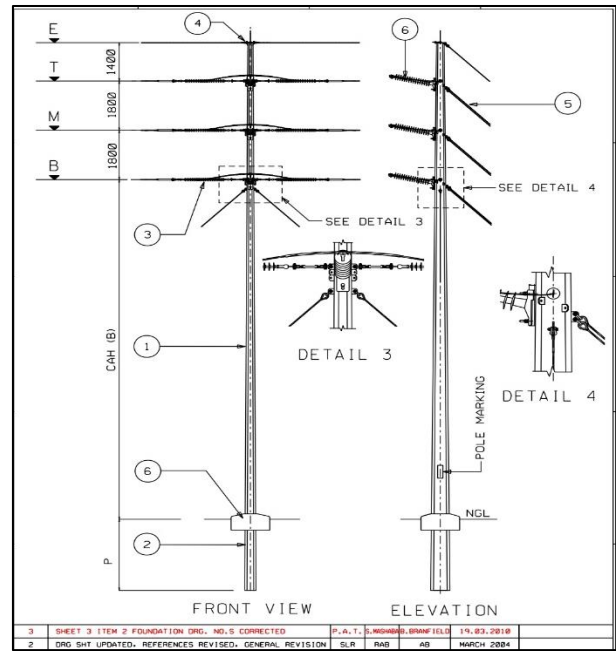
Suspension Self-supporting lattice structure (248A)



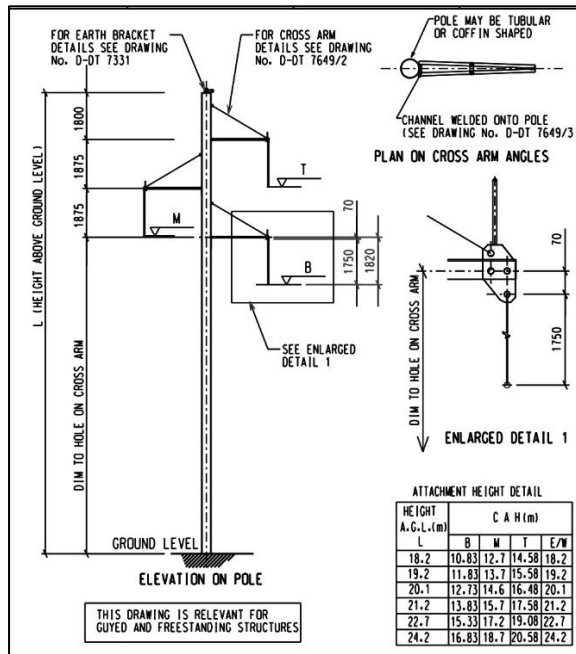
Strain Self-supporting lattice structures(248B)



7611: Intermediate mono pole structure



7615: Guyed mono pole strain structure



Suspension mono pole structures (7649)

Figure 2-1: Towers being considered.

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### 2.2.1.5 Service Access Roads

Temporary access routes capable of accommodating the construction plant, material and workers are required to construct each tower and install conductors. The cleared powerline servitude will be used for access.

## 2.3 PRE-CONSTRUCTION AND CONSTRUCTION PHASE

The main works for the construction of the 132kV power lines and substation upgrade include the following:

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### 2.3.1 Pre-Construction

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#### 2.3.1.1 Land Negotiation

132kV power lines are constructed and operated within a servitude that is established along the entire length of the line. Within this servitude, Eskom has certain rights and controls that support the safe and effective operation of the line. These include:

- (i) Access to erect a distribution line along a specific agreed route;
- (ii) Reasonable access to operate and maintain the line inside the servitude area;
- (iii) The removal of trees and vegetation that will interfere with the operation of the power line.

Eskom is responsible for the servitude negotiation process undertaken after a route has been environmentally authorized by DFFE. This process must be completed with the relevant landowners before construction starts on that property. The negotiation involves the following steps:

- Once the route is confirmed, the servitude agreement will be finalized with the individual landowners. This agreement will set out the conditions for the establishment and operation of the servitude, the exact location of the towers, and access arrangements and will be site-specific as different landowners may have different requirements.
- Compensation payments are made when the servitude is registered at the Deeds office.
- Once construction is complete and the land rehabilitated to the landowners' satisfaction, the landowner signs a "Final Release" certificate. Until the "Final Release" certificate has been signed, the relevant Eskom Division remains liable for the condition of the land. Once the clearance certificate is signed, the responsibility for the line and servitude is handed over.

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### 2.3.1.2 Right of Way Surveying

Before the overhead power line is constructed, a thorough ground survey is carried out to determine the ground profile along the centre of the power line route and where the ground profile slopes across the power line route. This is to ensure that the location selected for towers and stays and their relationship with each other comply with the technical limits laid down for maximum span lengths, maximum sums of adjacent spans and safe clearance to live conductors in the final tower siting. Further consideration is given to detailed environmental effects. Where the line route passes over or near trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned before the line's construction.

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### 2.3.1.3 Soil sampling

Geotechnical investigations will be carried out at tower positions to determine the type of foundation required. The holes will be filled in after soil sampling is completed.

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### 2.3.1.4 Structure Stacking

A survey crew will peg the power lines' servitude.

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## 2.3.2 Construction Phase

The construction of the line is a sub-activity of the construction of the Solar Plant, and the project is expected to require 12 months to complete. The sequence of construction activities is listed below and briefly discussed in the following sections:

- ❑ Construction campsite and laydown area establishment.
- ❑ Servitude gate installation to facilitate access to the servitude.
- ❑ Vegetation clearing to facilitate access, construction, and the safe operation of the infrastructure.
- ❑ Establishing access roads on the servitude where required.
- ❑ Preparation for construction right-of-way and ground preparation.
- ❑ Pegging of tower positions for construction.
- ❑ Transportation of equipment, materials and personnel to site and stores.
- ❑ Installation of foundations for the towers.
- ❑ Tower assembly and erection.
- ❑ Conductor stringing and regulation.
- ❑ Transfer of the line from the Contractor for commissioning.
- ❑ Final inspection of the line, commissioning and transfer to the Grid Line and Servitude Manager for operation.
- ❑ Rehabilitation of disturbed areas.

- ❑ Signing off Landowners on acceptability of the rehabilitation upon completion of the construction and rehabilitation.
- ❑ Transfer of the servitude by the Grid Environmental Manager; and
- ❑ Operation and maintenance of the infrastructure.

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#### 2.3.2.1 Construction Camp

The establishment of the construction camp will involve the clearing of vegetation, fencing of the camp and the construction of workshops and storerooms as well as temporary site offices. The location is selected by the contractor who will consider such aspects as access to the construction site, access to services, access to materials, etc. The contractor will then agree with a landowner for the establishment of the construction camp.

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#### 2.3.2.2 Clearing

The Right of Way (ROW) must be cleared to allow for construction and operation activities of the power line; hence the landowners will be notified before construction clearing.

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#### 2.3.2.3 Access Road Construction

Where construction of a new road has been agreed upon, the road width shall be determined by need, such as equipment size, and shall be no wider than 4m. The proposed servitude will also be used to access each tower location.

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#### 2.3.2.4 Foundation Installation

A work crew will excavate the foundations for the tower structures and the foundation is influenced by the terrain encountered and the underlying geotechnical condition. The actual size and type of foundation to be installed will depend on the soil bearing capacity and can be excavated manually or by using machines. The foundations will be backfilled, stabilized through compaction and capped with concrete.

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#### 2.3.2.5 Erecting structures and stringing Conductors

The Right of Way corridor may be used as an area for temporary storage and handling of equipment and materials related to construction. Steel components of structures may be delivered and placed on the ground near foundation sites. Once foundations are in place, the erection of the structures within the Right of Way will be done.

## 2.4 BULK SERVICES AND INFRASTRUCTURE

The supply of the following basic services forms part of the contract between Eskom and the contractor hence the contractor will acquire the agreements. The proposed services are indicated below:

- i. **Water:** This report has not quantified the expected volume of water required for this project's construction phases. A general authorization may be required if the water required for construction is sourced from the Vaal River, where the abstracted quantities are more than what is permissible within the quaternary catchment.
- ii. **Sewerage:** Sewerage generation is anticipated during the construction phase due to the presence of the workforce contracted for the project. Consequently, portable chemical toilets are suggested, which will be serviced periodically.
- iii. **Stormwater:** Storm-water measures will be implemented to suit the terrain. The measures to be implemented are detailed in the Environmental Management Programme attached in Appendix G.
- iv. **Solid Waste:** It is anticipated that solid waste will be produced mostly in the construction phase such as litter, packaging materials such as plastics, carton boxes, paper, beverages, and stockpiles. This type of waste will not pose any threat to the proposed project and will not require a Waste Management License.

## 2.5 OPERATION AND MAINTENANCE OF THE POWER LINE

The management of a distribution line servitude depends on the details and conditions of the agreement between the landowner and Eskom and is, therefore site-specific. These may, therefore, vary from location to location. However, it is common that there is a dual responsibility for the maintenance of the servitude and Eskom will be responsible for the tower structures, access roads, and roads relating to servitude access.

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### 2.5.1 Land Use and Power Line Operation

Literature studies have shown that farming and associated infrastructure such as irrigation systems and support structures, can be practised under 132 kV power lines provided that all the safe working clearances, crop height restrictions and building restrictions are properly followed. However, there is also a need for the landowner to have an agreement with Eskom concerning the activities that can be carried out underneath the servitude. The following activities are generally allowed:

- **Livestock grazing:** Bush clearing in the servitude will have little impact on the grazing potential of the land because most of the vegetation can be re-established under servitude. Overhead power lines do not affect the behaviour of livestock health; therefore, they can continue to feed underneath the power line once the cleared vegetation becomes re-vegetated; and
- **Overhead power lines** do not affect the growth of any crops and other low-growing vegetation. Tree height should not exceed the minimum height restriction.

### 3 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

This section of the report details the information required as per Section 3(1)(e) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

**(e) a description of the policy and legislative context within which the development is proposed including—**

- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and
- (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments.

Environmental laws are formulated to realize sustainable development strategy, preventing adverse impacts on the environment from implementing plans and construction projects and promoting coordinative development of the economy, society, and environment. Most developments are regulated by legislation, with the Constitution of the Republic of South Africa and the National Environmental Management Act (NEMA) being the cornerstone of environmental law. The aim of the legislation is to incorporate both human rights and sustainable development in terms of the environment. The following laws, principles and regulations have been formulated to promote environmental sustainability and that are relevant to this project are discussed below:

#### 3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

Section 24 of the Constitution of South Africa guarantees basic human rights and provides guiding principles for society. The environmental rights in the constitution state:

“Everyone has the right –

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

Based on this section, there is a need to ensure that the assessment of this project will consider the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

The Bill of Rights in Chapter 2 of the Constitution entrenches the right to information, freedom of expression, participation in political activity, administrative justice and fundamental science, cultural,

legal, economic and environmental rights. In addition, the Constitution requires all legislature to facilitate public involvement in the legislative and other policy processes. Citizens have the right to engage in public initiatives and processes on an ongoing basis. Based on the Bill of Rights, the public will access all information developed and compiled during the Basic Assessment process.

### **3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998)**

The National Environmental Management Act (NEMA) aims to improve the quality of environmental decision-making by setting out principles for environmental management that apply to all government departments and organisations that may affect the environment. NEMA also creates a framework for facilitating the role of civil society in environmental governance (see below).

The Principles of National Environmental Management state that - (DEAT 1998b)

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- Environmental justice must be pursued.
- Equitable Services Access to environmental resources to meet basic human needs and ensure human well-being must be pursued.
- Responsibility for the environmental health and safety consequences of a project or activity must exist throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted.
- Decisions must consider the interests, needs and values of all interested and affected parties.
- The social, economic and environmental impacts of activities must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and Services Access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of which environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects must be paid for by those responsible for harming the environment.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.



### 3.2.1 Environmental Impact Assessment (EIA) Regulations

EIA Regulations [GNR982 as amended]/ GNR326] published terms of sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), makes provision for two types or levels of assessment, namely Basic Assessment and Scoping and EIA. The EIA regulations specify that all activities that appear in Listing 1 [GN No. R. 983 (as amended)/GNR 327] and Listing 3 [GN No. R. 985 (as amended)/GNR 324] require a Basic Assessment. As the proposed development triggers activities in Listing Notice 1 (GNR 327) and Listing Notice 3 (GNR 324) a Basic Assessment process will be followed with the application being lodged with the Department of Forestry, Fisheries and the Environment (DFFE). The listed activities being applied for are indicated in the table below:

**Table 3-1: Triggered Activities**

| Relevant Government Notice                           | Activity              | Description   | Applicability   |
|--|-----------------------|---|---|
| Listing Notice 1, Government Notice No. R327 of 2017 | 11(i)                 | The development of facilities or infrastructure for the transmission and distribution of (i) Electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.                 | Construction of a 132kV powerline to be operated at 88kV until there is a future need for it. The powerline will connect the authorised Lethabo PV Plant to the existing Lethabo RWB substation. The length of the powerline will be approximately 4.5km. |
| Listing Notice 1, Government Notice No. R327 of 2017 | 19                    | The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. | The possible excavating of more than 10 m <sup>3</sup> and infilling of wetlands with more than 10 m <sup>3</sup> of material during construction.  |
| Listing Notice 3, Government Notice R324 of 2017     | 12 (b)(iv)            | The clearance of an area of 300 square meters or more of indigenous vegetation in the (b) Free State (iv) areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.”                 | The clearance of 300m <sup>2</sup> of vegetation at tower positions within 100m of the delineated wetlands.   |
| Listing Notice 3, Government Notice R324 of 2017     | 14 (ii)(b)(b)(i) (ff) | The development of infrastructure or structures with a physical footprint of 10 square metres or more where such development occurs.<br><br>(c) if no development setback has been adopted, within 32 metres of Critical          | The proposed corridors are within ESA 1 and 2 and the cumulative area of the towers that will be placed within 32m of wetlands exceeds 10 square metres.  |

|  |  |   |  |
|--|--|---|--|
|  |  | biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans |  |
|--|--|---|--|

### 3.2.2 Integrated Environmental Management (IEM)

According to DEAT, 2004, IEM provides a holistic framework that can be embraced by all sectors of society for the assessment and management of environmental impacts and aspects associated with an activity for each stage of the activity life cycle, taking into consideration a broad definition of environment and with the overall aim of promoting sustainable development. The following series of IEM Guidelines were therefore used during the entire EIA process:

- ❑ Stakeholder Engagement, Integrated Environmental Management, Information Series 3.
- ❑ Specialists Studies, Integrated Environmental Management, Information Series 4.
- ❑ Impact Significance, Integrated Environmental Management, Information Series 5.
- ❑ Ecological Risk Assessment, Integrated Environmental Management, Information Series 6.
- ❑ Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.
- ❑ Criteria for determining alternatives, Integrated Environmental Management, Information Series 11.
- ❑ Guideline on need and desirability (2017)

### 3.3 OTHER RELEVANT LEGISLATION

In addition to the two laws indicated above, the following laws, regulations, and documents in Table 3-2 also have relevance to the project:

**Table 3-2: Legislative Framework**

|   |
|---|
| <b>International Conventions</b>  |
| <p><b>The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal</b></p> <p>It was adopted in 1989, and it came into force in 1992. The Convention is the most comprehensive global environmental agreement on hazardous and other waste. It is a global control system for importing and exporting hazardous waste, and the framework:</p> <ul style="list-style-type: none"> <li>• Improves how hazardous waste is managed.</li> <li>• Helps prevent harmful impacts on the environment and human health.</li> </ul> |

### **United Nations Sustainable Developmental Goals (SDGs)**

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all developed and developing countries in a global partnership. They recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

The proposed project contributes to SDG 7, which ensures access to affordable, reliable, sustainable and modern energy. Energy is crucial for achieving almost all the Sustainable Development Goals, from its role in eradicating poverty through advancements in health, education, water supply and industrialization, to combating climate change.

### **SPECIFIC ENVIRONMENTAL MANAGEMENT ACTS**

|   |   |
|---|---|
| <b>National Environmental Biodiversity Act (Act 10 of 2004)</b> | <b>Administering Authority:</b> National and Provincial |
|---|---|

The Act sets out the mechanisms for managing and conserving South Africa's biodiversity and its components; protecting species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting, including indigenous biological resources. Some of the lists that have been promulgated in terms of various sections of the Act are:

- i. GN 1003 of 18 September 2020: Alien and Invasive Species Lists, 2020
- ii. GN 2747 of 18 November 2022: The revised National list of ecosystems that are threatened and in need of protection. Categories are defined as Critically Endangered, Endangered, Vulnerable, and Protected, depending on their ecological structure, function and composition.

The primary implication of the Revised National List of Ecosystems that are Threatened or in need of Protection is that it is linked to Listing Notice 3 published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The ecosystem within the project area is not classified as threatened; hence no activity has been applied for in terms of Listing Notice 3. Mitigation measures have been recommended for the conservation of biodiversity.

|  |  |
|--|--|
| <b>National Environmental Management: Air Quality Act (Act No. 39 of 2004)</b> | <b>Administering Authority:</b> Municipalities |
|--|--|

The Act has introduced prescribed standards to protect and enhance air quality and pollution prevention in South Africa. This includes the National Ambient Air Quality Standards (AAQ Standards), which set ambient air quality standards for sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>) and particulate matter, amongst other priority pollutants. In addition, the Minister has published the National Dust Control Regulations in the gazette for controlling dust in all areas (Government Gazette No.36974, Notice No.827 of 01 November 2013), including the requirements for monitoring, dust management plan development and implementation and reporting.

Though the proposed area is within the Vaal Triangle Airshed Priority Area (VTAPA), the project's impact on air quality is low. Mitigation measures have been recommended to ensure the minimisation of duct emissions during construction.

|  |   |
|--|---|
| <b>National Environmental Management: Waste Act 59 of 2008</b> | <b>Administering Authority:</b> All Spheres |
|--|---|

NEMWA sets out to protect health and the environment in terms of the constitutional right to have an environment that is not harmful to health and well-being, and to protect the environment for the benefit of present and future generations while promoting justifiable economic development. This is to be achieved through measures including uniform application of strategies throughout the Republic as well as norms and standards which seek to ensure best waste practices within a system of co-operative governance to achieve:

- prevention of pollution and ecological degradation through institutional arrangements, planning and standards for regulating waste management by all spheres of government.
- remediation of contaminated land
- implementation of the national waste information system
- compliance and enforcement.

Section 26 and 27 prohibits unauthorised disposal and littering. Mitigation measures have therefore been recommended to address waste management.

#### WATER

**National Water Act (Act No. 36 of 1998)**

**Administering Authority: DWS**

The Act seeks to ensure that the country's water resources are protected, used, developed, conserved, managed, and controlled in a manner that considers relevant factors such as meeting the basic human needs of present and future generations. In terms of Section 19(1) an owner of land or a person in control of land where any activity or process is or was performed or undertaken or where any situation exists must take all reasonable measures to ensure that which causes, has caused, or is likely to cause pollution of a water resource, must take all appropriate measures to prevent any such pollution from occurring, continuing or recurring. Section 19(2) further indicates that measures must be undertaken to cease or modify the activity, comply with any waste standard or management practice or eliminate the source of pollution. It further clarifies what is termed water use, and these 11 waters uses, as specified in Section 21, require a license/ General Authorization/ Water Use Licence.

A General Authorisation/ Water Use Licence is required per Section 21(c) and (i) of the Act since the preferred route alternative is within 500m of delineated wetlands.

#### HERITAGE

**National Heritage Resources Act (Act No. 25 of 1999)**

**Administering Authority: SAHRA and Provincial**

This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. The National Heritage Resources Act (NHRA) has introduced an integrated system for the identification, assessment and management of the heritage resources of South Africa. The NHRA makes provision for the general protection of heritage resources:

- Section 34 in respect of the built environment.
- Section 35 in respect of archaeology, palaeontology and meteorites; and
- Section 36 in respect of graves and burial grounds.

Section 38 sets out guidelines for Heritage Resources Management and the conditions under which heritage impact assessments are required when developments impact upon heritage resources. If the appropriate authority permits the disturbance, the impacts on heritage resource/s affected must be mitigated to ensure the recovery and recording of information about that site.

The screening tool has indicated the sensitivity of Palaeontology and Cultural Heritage to be high and low, respectively. An archaeologist has been commissioned to assess the significance of the project's impacts on archaeological and palaeontological resources.

**AGRICULTURE**

|  |   |
|--|---|
| <b>Conservation of Agricultural Resources Act (Act No. 43 of 1983)</b> | <b>Administering Authority:</b> Department of Agriculture, Forestry and Fisheries |
|--|---|

The Conservation of Agricultural Resources Act ([CARA] Act 43, 1983) provides for the:

- o Protection of wetlands; and
- o Requires the removal of listed alien invasive species.

This Act also requires that any declared invader species on Eskom land must be controlled according to their declared invader status.

**ENERGY**

|   |  |
|---|--|
| <b>National Energy Act of 2008 &amp; Electricity Regulation Act</b> | <b>Administering Authority:</b> Department of Energy |
|---|--|

The purpose of the act is to ensure that diverse energy resources are available in sustainable quantities and at an affordable price and to provide for integrated energy planning, increased generation and consumption of renewable energies, contingency energy planning, holding of strategic fuel stocks and carriers, provide appropriate energy infrastructure, data on energy demand, supply and generation and establish institutions responsible for energy research.

|   |  |
|---|--|
| <b>White Paper on the Energy Policy of the Republic of South Africa December 1998</b> | <b>Administering Authority:</b> Department of Energy |
|---|--|

The White Paper on Energy Policy (DME, 1998) sets out the Government's policy concerning the supply and consumption of energy for the next decade. The policy strengthens existing energy systems in certain areas, calls for the development of underdeveloped systems and demonstrates a resolve to bring about extensive change in several areas. The policy addresses all elements of the energy sector.

|   |  |
|---|--|
| <b>White Paper on Renewable Energy, November 2003</b> | <b>Administering Authority:</b> Department of Energy |
|---|--|

This White Paper on Renewable Energy supplements the White Paper on Energy Policy, which recognises that renewable energy's medium and long-term potential is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. It also informs the public and the international community of the Government's vision and how it intends to achieve these objectives and informs Government agencies and organs of their roles in achieving the objectives.

The overall project contributes to the vision and goals indicated in the paper.

|                                      |                               |
|--------------------------------------|-------------------------------|
| <b>Strategic Integrated Projects</b> | <b>SIP Coordinator:</b> Eskom |
|--------------------------------------|-------------------------------|

The South African Government adopted an Infrastructure Plan, and from the spatial analysis of the country's needs carried out, 17 Strategic Integrated Projects (SIP) have been identified that cover a wide range of economic and social infrastructure. In addition to the SIPs considered for the Solar Plant, the construction and operation of the powerline and associated infrastructure addresses the following SIP:

**SIP 10: Electricity transmission and distribution for all**

Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. The activities undertaken for the proposed project will contribute to SIP 10 is achieved.

**ASTRONOMY ADVANTAGE AREAS**

|   |                                       |
|---|---------------------------------------|
| <b>The Astronomy Geographic Advantage (AGA) Act 21 of 2007</b>  | <b>Administering Authority: SARAO</b> |
| <p>The Act gives the Minister of Science and Technology the power to protect areas, through regulations, that are of strategic national importance for astronomy and related scientific endeavours. Regulations (R.465 of 22 June 2012) have been promulgated in terms of Sections 22 and 23 of the Act to prohibit or restrict certain activities in core Astronomy Advantage Areas in terms of the Astronomy Geographic Advantage Act, 2007. Regulation 2f indicates the restriction to the operation, construction or expansion of facilities for generating, transmitting or distributing electricity.</p> <p>Though the proposed project is not within a declared AAA core area, SARAO has been included as a stakeholder.</p>   |                                       |
| <b>HEALTH AND SAFETY</b>  |                                       |
| <b>Occupational Health and Safety Act (Act No. 85 of 1993)</b>  | <b>Administering Authority: DoL</b>   |
| <p>The purpose of the act includes providing for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.</p> <p>Alongside the Act, a compensation scheme for victims of occupational accidents and diseases and their dependants is foreseen in the Compensation for Occupational Injuries and Diseases Act 130 of 1993. In addition, there are ancillary occupational safety and health regulations (e.g, Construction Regulations, 2014; Environmental Regulations for Workplaces, 1987; Facilities Regulations, 2004).</p> <p><u>The applicable Regulations should be implemented and adhered to during the project life cycle.</u></p> |                                       |
| <b>OTHER LEGISLATION</b>  |                                       |
| <ul style="list-style-type: none"> <li>✓ National Forest Act (Act No. 84 of 1998)</li> <li>✓ Infrastructure Development Act 23 of 2014</li> <li>✓ Promotion of Access to Information Act (No. 2 of 2000)</li> <li>✓ Promotion of Administrative Justice Act (No.3 of 2000)</li> <li>✓ Protection of Personal Information Act (No. 4 of 2013)</li> <li>✓ Spatial Planning and Land Use Management Act (Act No. 16 of 2013)</li> <li>✓ Hazardous Substances Act (No. 15 of 1973)</li> <li>✓ National Roads Act (Act No. 93 of 1996)</li> </ul>  |                                       |
| <b>REGULATIONS</b>  |                                       |
| <ul style="list-style-type: none"> <li>✓ National Appeal Regulations of 2014</li> <li>✓ Regulations laying down the procedure to be followed for the adoption of spatial tools or environmental management instruments published (GN 542, 2019)</li> <li>✓ Procedures for the assessment and minimum criteria for reporting on identified environmental themes (GN 320, 2020)</li> </ul>  |                                       |
| <b>GUIDELINES AND PLANS</b>   |                                       |
| <ul style="list-style-type: none"> <li>✓ National Biodiversity Assessment, 2018</li> <li>✓ Just Energy Transition Investment Plan (JET IP)</li> <li>✓ National Development Plan</li> </ul>  |                                       |

|  |
|--|
| <ul style="list-style-type: none"> <li>✓ South Africa's National Infrastructure Plan 2050, Government Notice No. 1874 of 2022</li> <li>✓ Integrated Resource Plan (2019)</li> </ul>  |
| <b>PROVINCIAL, DISTRICT AND LOCAL MUNICIPALITIES</b>   |
| <ul style="list-style-type: none"> <li>✓ Free State Province Growth &amp; Development Strategy</li> <li>✓ Metsimaholo Local Municipality IDP (2023-24)</li> <li>✓ Metsimaholo Local Municipality SDF (2016-17)</li> <li>✓ Metsimaholo Local Municipality LED Strategy</li> <li>✓ Fezile Dabi District Municipality IDP (2022 - 2027)</li> <li>✓ Free State Noise Regulations GN 24/PG 35/19980424</li> </ul> |

### 3.4 PERMITS AND REGISTRATIONS

Table 3-3 indicates the permits that are required for the project.

**Table 3-3: Required Permits**

| LEGISLATION   | PERMIT                                      | COMPETENT AUTHORITY  | PHASE    |
|---|---|--|----------|
| NEMA:<br>EIA Regulations GNR 982 (as amended)   | Environmental Authorisation                 | Department of Forestry, Fisheries and the Environment (DFFE) | Planning |
| National Water Act<br>Government Notice (GN) 509, published in August 2016 in Government Gazette (GG) no. 40229 | Water Use Licence/<br>General Authorisation | Department of Water and Sanitation (DWS)                     | Planning |

## 4 NEED AND DESIRABILITY

This section of the report details the information required as per Section 3(1)(f) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

(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

DEA, 2017 highlights the need to consider how the proposed project may impact ecosystems, biological diversity; pollution; and renewable and non-renewable resources. In addition, there is also a need to assess how the development may affect or promote justifiable economic and social development by considering the relevant spatial plans, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). Therefore, need and desirability addresses whether the development is being proposed at the right time and place. Similarly, the 'Best Practicable Environmental Option' (BPEO), as defined in NEMA, is "the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term."

In responding to the growing electricity demand within South Africa, the need for diversifying Eskom's energy mix, and meeting the country's targets for renewable energy, Eskom has undertaken initiatives to establish renewable forms of electricity generation capacity. Energy supply will enable economic growth and development. The energy mix will be bolder on sustainability and achieving the least cost. This will require reduced reliance on coal and growing reliance on renewable energy, especially solar and wind, which play a dominant role in a least-cost energy mix and where South Africa has a significant advantage. By 2050, energy demand is projected to double. Installed generation capacity will therefore need to expand from 53 GW in 2018 to between 133 GW and 174 GW by 2050, depending on energy demand at that time. By 2030, at least 25 GW will have to be added to the installed capacity with the requisite supportive transmission and distribution network infrastructure.

The power line being applied for an EA forms part of the electrical infrastructure required for the authorised Lethabo Solar PV Power Plant. At the time of the EIA application for the Lethabo Photovoltaic Solar Power Plant, Eskom's motivation for establishing the plant was to encourage diversification of their energy mix at the various power stations. The capacity of 75 MW applied for exceeds the capacity allocated for self-consumption (8 – 12 MW) at the power station. As such, Eskom intends to evacuate power to the Lethabo RWB substation. In addition, establishing the plant also promotes the reduction of Eskom's carbon footprint and support the demand side management energy efficiency programme.



At the national, provincial, and local levels, there is a strong commitment to the growth of renewable energy sources and the energy infrastructure that goes along with it. The National Development Plan, New Growth Path Framework, and National Infrastructure Plan, which all emphasize the significance of energy security and investment in energy infrastructure, all support the development and investment in renewable energy and related energy distribution infrastructure. Therefore, the development of the planned power line is backed by important policy and planning documents and is consistent with the strategic energy planning environment of South Africa.

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## 5 BASIC ASSESSMENT PROCESS

A Basic Assessment (BA) is a proactive and systematic process where both positive and negative potential environmental impacts associated with certain activities are assessed. Every BA project has two objectives, namely, process and content objectives. The process objectives are to ensure that the process is open, transparent and inclusive, supply stakeholders with sufficient information, afford them ample opportunity to contribute and make them feel that their contributions are valued. The content objectives of the project are in the form of “hard” information: facts based on scientific and technical study, statistics or technical data.

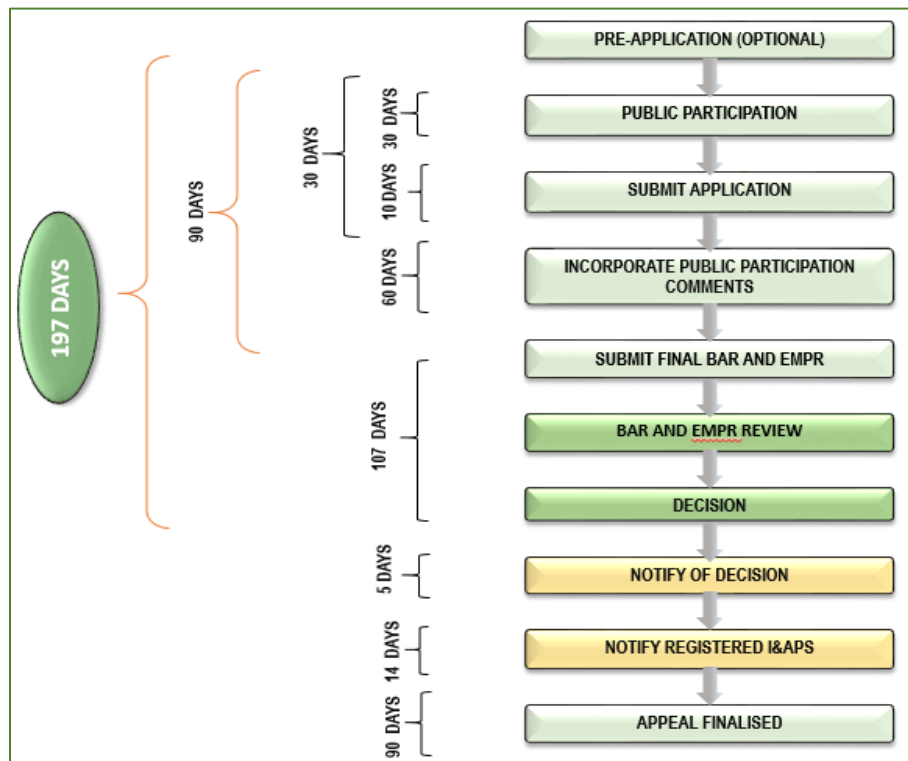
Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, inter alia, concerning every application for environmental authorization, ensure that the general objectives of Integrated Environmental Management (IEM) are considered. The BA should include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and an assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity. Figure 5-1 presents the BA process to be followed for the proposed development.

### 5.1 OBJECTIVES OF A BASIC ASSESSMENT

The objectives of the BA process are:

- (a) To determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context.
- (b) Identify the alternatives considered, including the activity, location, and technology alternatives.
- (c) Describe the need and desirability of the proposed alternatives,
- (d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of the impact of the proposed activity and technology alternatives on these aspects to determine:
  - i. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - ii. the degree to which these impacts:
    - (aa) can be reversed.

- (bb) may cause irreplaceable loss of resources; and
  - (cc) can be managed, avoided or mitigated.
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
- i. identify and motivate a preferred site, activity and technology alternative.
  - ii. identify suitable measures to manage, avoid or mitigate identified impacts; and
  - iii. identify residual risks that need to be managed and monitored.



**Figure 5-1: Basic Assessment Process**

## 5.2 METHODOLOGY

The following steps have been undertaken for this assessment:

### 5.2.1 Screening Phase

In terms of the BA process, the EAP reviewed the acceptability of the project concept against available planning information such as the IDP, SDF, EMFs, Conservation Plans as well as Land-use Management System. The process also entailed the determination of whether an Environmental Authorisation is required. This was determined by the size of the project and site-specific information. In addition, a

Screening Report generated from the National Web-based Environmental Screening Tool provided site-specific baseline information and risk assessment to guide the EIA process. Specialist studies required were also identified in the report. See Appendix B for the Screening Report. The presence of fatal flaws was also considered and consequently, the identification of avoidance measures at the planning stage.

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### 5.2.2 Pre-Application Meeting

DIGES requested a meeting with DFFE to discuss the project (based on the screening report and initial site assessment) and agree on the relevant activities to be applied for, the specialists' studies required, and the public participation process to be followed. The minutes are attached in Appendix H.

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### 5.2.3 Literature Review

A background study was undertaken to assess the environmental baseline conditions of the project area. Policy, legal and administrative framework and requirements were identified through the review of relevant legal documents, guidelines and planning procedures. This was done to ensure that necessary measures were included in the design and implementation of the project. Reference is made to Section 3 of this report. The following documents were also consulted:

- i. Farm owner information from Windeed.
- ii. Free State, Fezile Dabi and Metsimaholo Local Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs).
- iii. Free State Conservation Plan.
- iv. Department of Water and Sanitation(DWS), then Department of Water Affairs (DWA) Integrated Environmental Management (IEM) series.
- v. Lethabo Solar Power Plant EIA documents.
- vi. Other Provincial and local municipality environmental tools.
- vii. Eskom's project motivation.

In addition, spatial data was also used to identify the affected farms, different habitats and sensitive areas within the area of study.

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### 5.2.4 Site Assessment and Specialists' Studies

A preliminary site assessment was undertaken by Diges and Eskom to establish the baseline conditions that exist before the proposed development proceeds and to verify if site sensitivities were as per the Screening Report. Reference is made to Appendix E-1. Based on this assessment, the relevant specialists were appointed, and the field surveys were undertaken as a team to ensure that issues/ fatal

flaws that may arise are addressed timeously. The detailed site assessments were covered on foot as the area is relatively small. The area was documented by taking photographs and identifying areas of interest by taking coordinates using a Global Positioning System. The assessment methodologies applied by the specialists are based on guidance specific to each topic area, i.e., protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes.

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### 5.2.5 Public Participation

The Lethabo Solar PV Plant stakeholder database was utilized to identify Interested and Affected Parties whilst CGS and Windeed were consulted for the details of the landowners. Stakeholder Government Departments and affected Local and District Municipalities were also contacted to get the contact details of the relevant officials. See Appendix F- 4 for the IAP database. The letters and Background Information Documents (BID) were submitted to stakeholders via e-mails. Reference is made to Appendix F-1 and F-2 for proof of notification.

Notices concerning the proposed development were placed on site to inform locals about the proposed project. Reference is made to Appendix F-3 for site notice photos. Adverts have been published in the Sowetan and the Vaalweekblad newspapers to notify the public about the availability of the draft Basic Assessment Report and attachments for review, the date and venue for a public meeting. The draft Basic Assessment will be submitted to IAPs for a 30-day review period.

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### 5.2.6 Impact Assessment

The impact assessment carried out was guided by the following criteria:

- **Assessment Criteria for Impacts:** To determine the significance of the various impacts that can or may be associated with the project, a series of assessment criteria were used for each impact. These criteria included an examination of the nature, extent, duration, intensity and probability of the impact occurring and assessing whether the impact will be positive or negative for the biophysical and social environments at the site and surrounding areas.
- **Environmental Sensitivity Map:** An environmental sensitivity map was used to indicate environmentally sensitive features found on site that must be protected.
- **Maximization of Positive Impacts:** The philosophy followed focused on maximizing the benefits to the local environment.
- **Specialists Integration:** All information from specialists was collated and summarized it in this report.
- **Identification of Mitigation Measures and Environmental Management Programme:** The mitigatory measures recommended describe possible actions to reduce the significant negative

environmental impacts identified in the assessment. As per Government Notice 435 of March 2019, a project that entails the construction of power lines and substations should submit a generic EMPr as developed by the Competent Authority. The plan provides guidelines for the planning, construction, operation, and maintenance of the proposed power line and substation upgrade and a holistic management and monitoring plan for the entire project. The relevant Sections as determined, have been completed and the EMPr is appended to this report.

### **5.3 ASSUMPTIONS AND LIMITATIONS**

The following assumptions have been made during this study:

- ✓ It is assumed that the Applicant has provided adequate details concerning the activities to be carried out during the construction and operation phase.
- ✓ This study was carried out with the information available to the EAP when executing the study within the available timeframe and budget. The sources consulted are not exhaustive, and additional information might exist, which might strengthen arguments or contradict information in this report.
- ✓ Due to erratic GPS satellite signal reception, the coordinates and elevations recorded will have an accuracy of only +/- 5 m.
- ✓ The study team obtained data on affected farm owners in the Windeed-Deeds office. This information is assumed to be correct and has identified all the affected landowners.
- ✓ Information used to inform the assessment was limited to data and GIS coverage available at a local, regional and national level at the time of the assessment.
- ✓ The specialists' reports are assumed to be factual and correctly indicate the environment and how the project activities will impact these resources.
- ✓ It is also assumed that public participation is adequate and has identified all the Interested and Affected Parties.
- ✓ An exact commencement date for the construction phase is unknown. It is assumed that construction will commence after an Environmental Authorization has been issued and the appeal process has been undertaken.

It has been assumed that the construction camp will be located within the Solar PV plant footprint and consist of temporary structures, ablution facilities, portable toilets, and shower facilities.

## 6 ALTERNATIVES

This section of the report details the information required as per Section 3(1)(g) and (h) (i) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

- g) a motivation for the preferred site, activity and technology alternative.
- (h) a full description of the process followed to reach the proposed preferred alternative within the site, including:
- (i) details of all the alternatives considered;

This chapter identifies and describes the proposed project's alternative infrastructure options and motivation for site selection. In terms of the NEMA EIA Regulations GN326, one of the criteria to be considered by the Competent Authority when considering an application is “*any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimize harm to the environment*”. Alternatives are defined in the Regulations as “*different means of meeting the general purpose and requirements of the activity*”. It is, therefore, necessary to provide a description of the need and desirability of the proposed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and the community, that may be affected by the activity.

The “*feasibility*” and “*reasonability*” of an alternative will therefore be measured against the activity's general purpose, requirements and need and how it impacts the environment and the community that may be affected by the activity. It is, therefore, vital that the identification, investigation and assessment of alternatives address the issues/impacts of a proposed development.

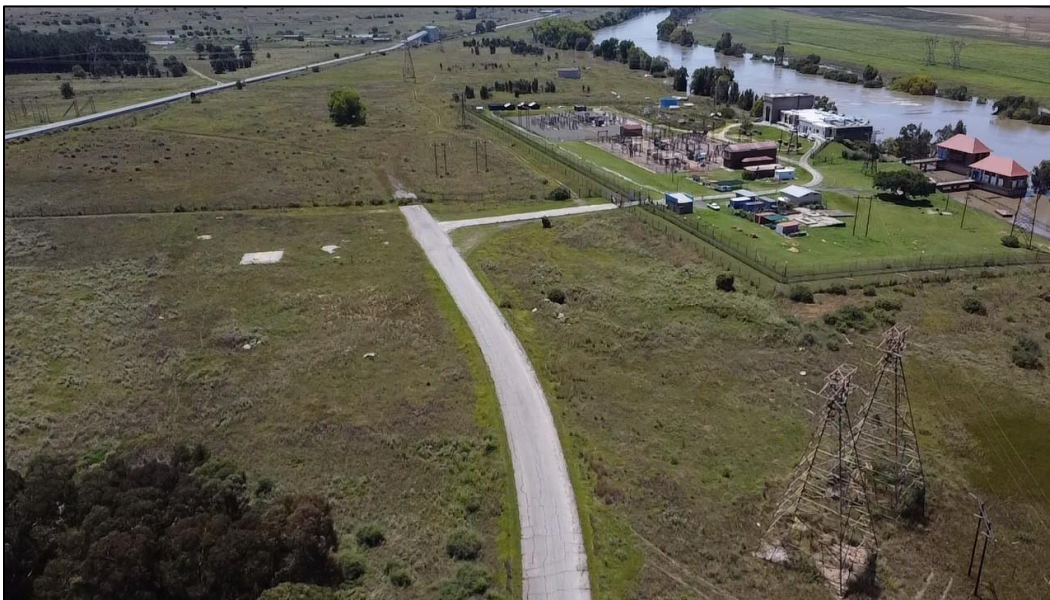
### 6.1 LOCATION ALTERNATIVES

‘These are considered for the entire proposal or a component, with the latter sometimes being considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate and alternative locations that are nearby. Alternative locations in the same geographic area are often referred to as alternative sites.’ DEAT, 2004.

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### 6.1.1 Route/ Corridor Selection Criteria

The terrain and location of the distribution line corridor and constructability issues must be considered for new and existing ROW since both may have a significant bearing on cost and effects on environmental resources. Among the constructability factors considered is the availability of space considering the existing infrastructure ability to avoid or minimize the location of structures along steep slopes or embankments or within environmentally sensitive areas such as wetlands. Considering these factors, the section out of the Lethabo Pumping Station was mainly determined by available space due to existing lines and obstacles, with the remaining sections running within an area characterised by wetlands. See the photos below. Due to the presence of the Vaal River in the east-northeast and Lethabo Power Station and its associated infrastructure in the north, the area considered for the corridors was small hence only two corridors (Corridor A and B) were identified. Hence, the land use and characteristics is the same for both corridors. The general project area is shown in the photos below, and the corridors are described below.



**Figure 6-1: A view of the substation area**





**Figure 6-2: The corridor will traverse across the area with Eucalyptus.**



**Figure 6-3: A view of the project area from RWB substation**

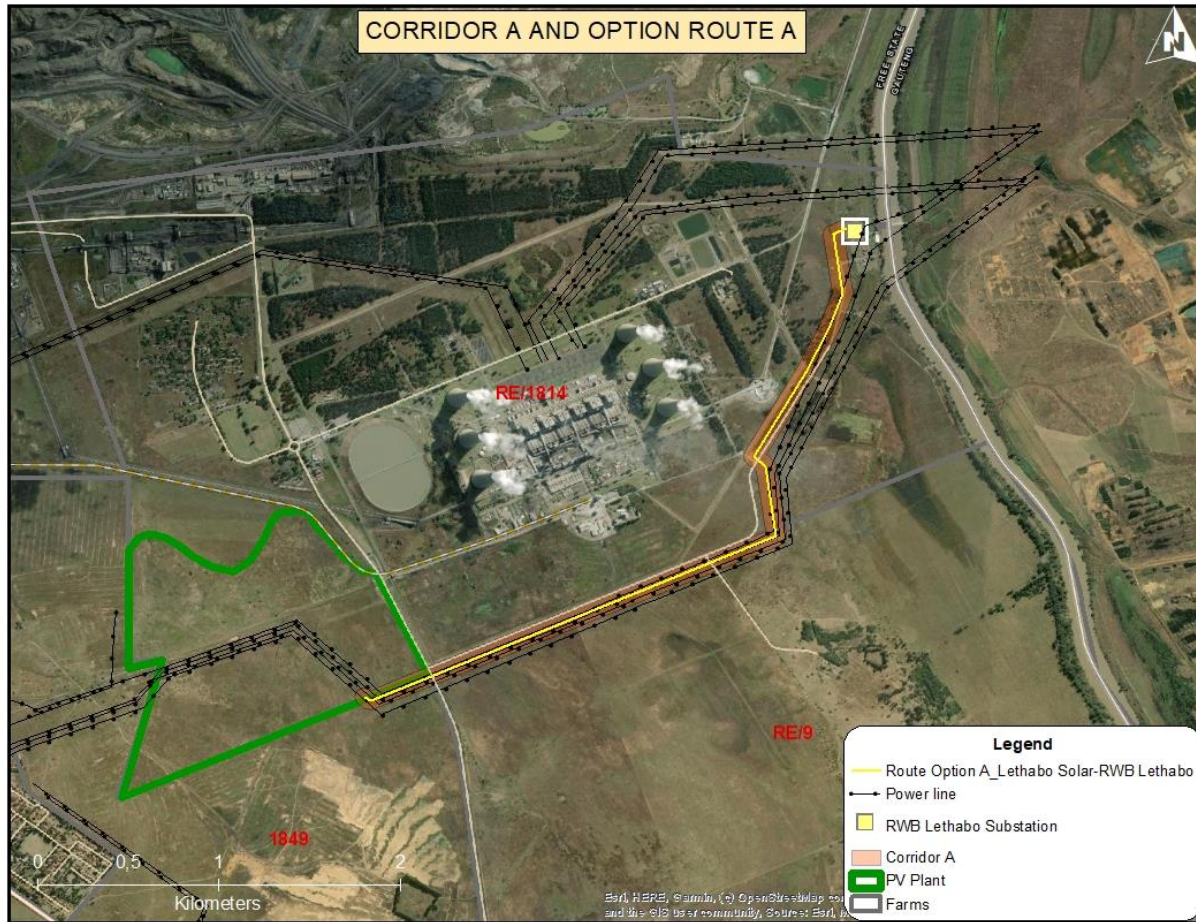


**Figure 6-4: General project area**

6.1.1.1 Corridor A and Alternative Route Option A (Preferred)

|                                    | Route Option A                         |
|------------------------------------|--|
| <b>Start (Lethabo Solar Plant)</b> | 26° 45' 17,278" S<br>27° 57' 58,783" E |
| <b>Mid-point</b>                   | 26° 44' 51,915" S<br>27° 59' 4,191" E  |
| <b>End (RWB Substation)</b>        | 26° 43' 53,679" S<br>27° 59' 24,735" E |
| <b>Length</b>                      | 4.1 km                                 |

From the authorized Solar Plant, the powerline crosses Dihlabakela road running parallel to the service road and traversing across the remainder of Bankfontein 9, an agricultural land. The corridor generally runs next to the service road and an existing 88kV powerline. The area traversed by the line from the authorized Solar Plant to RWB substation is dominated by grass species and densely populated eucalyptus species and wetlands. The advantage of this option is that it is next to the service road, and it avoids the wetland when it crosses Bankfontein 9. The map below shows the corridor.



**Figure 6-5: Location of Corridor A and Alternative Route Option A**

### 6.1.1.2 Corridor B and Alternative Route Option B

|                                    | Route Option B                         |
|------------------------------------|--|
| <b>Start (Lethabo Solar Plant)</b> | 26° 45' 17,278" S<br>27° 57' 58,783" E |
| <b>Mid-point</b>                   | 26° 44' 56,168" S<br>27° 59' 6,178" E  |
| <b>End (RWB Substation)</b>        | 26° 43' 53,679" S<br>27° 59' 24,735" E |
| <b>Length</b>                      | 4.3 km                                 |

Corridor 2 runs parallel to Corridor 1 from the authorised solar plant until it joins Corridor A. The environment is, therefore, the same as Corridor 1. The disadvantage of this line is that the first section

(near the point it joins corridor A) is routed next to an existing line near a wetland. This results in access limitations for maintenance when the water rises in the wetland. Reference is made to the map below.

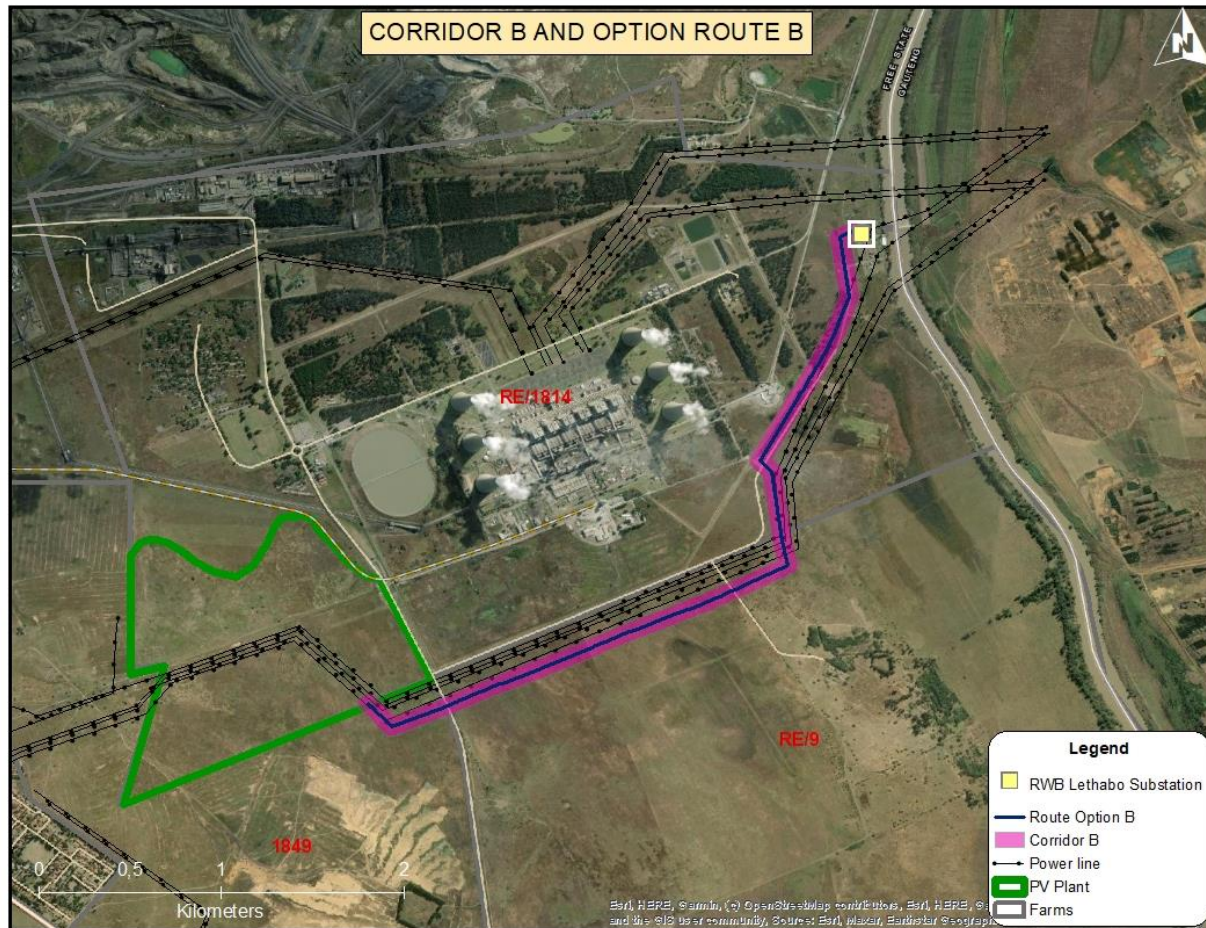


Figure 6-6: Location of Corridor B and Alternative Option B

### 6.1.1.3 Specialists Preferred Corridor Alternatives

The table below indicates the specialist recommendations for the preferred corridor alternative.

Table 6-1: Specialists Preferred Corridor

| THEME    | COMMENTS  |
|----------|---|
| Avifauna | <p>Option A is located next to a road; hence the displacement impact is likely to be less significant along this alignment, given the existing levels of disturbance associated with the vehicle traffic on this road. <b>Option A</b> is the preferred power line route alignment option.</p> <p>However, neither option is fatally flawed, and the power line can be constructed and operated along either option, with appropriate mitigation.</p> |

| THEME                           | COMMENTS  |
|---------------------------------|---|
| <b>Archaeology</b>              | The Assessment for the proposed construction of the Powerline did not yield any heritage resources within the footprint of both corridors. Considering all the above information, <b>Corridor Alternative One</b> is the preferred alternative from a heritage impact perspective due to its proximity to the road and existing line. |
| <b>Palaeontology</b>            | Since the impact will be low, the project should be authorized as far as palaeontology is concerned. Hence both alternatives are viable.  |
| <b>Terrestrial Biodiversity</b> | Both corridors are viable as no significant impacts are associated with developing any proposed corridors that cannot be reduced to a manageable level through mitigation.  |
| <b>Wetlands</b>                 | <b>Corridor A</b> is the preferred corridor as it is within the servitude of the existing powerline.  |

#### 6.1.1.4 Rand Water Board Lethabo Substation

An additional 88kV bay, including busbar extension and control plant extension, will be installed at the existing Rand Water Board (RWB) Lethabo Substation. This will be done within the substation area hence no clearing will be done.



**Figure 6-7: A view of the RWB substation**

## 6.1.2 No-Go Action Alternatives

The description of the baseline or existing environment or status quo is essential to all environmental assessments and should be focussed on the key characteristics of and values or importance attached to the environment. The baseline, or 'no-go' option, as well as all other relevant alternatives, must be described, assessed and evaluated at the same scale and level of detail that enables adequate comparison with the proposed project. DEAT, 2004

Implementing this option would result in:

- Failure to contribute clean energy to the grid.
- Failure by Eskom and the Government to reach the set target to produce renewable energy as indicated in the energy and Infrastructure policies and plans.
- Financial loss- money that has been utilised during the planning phase of the Solar Plant.
- Failure to reduce the unemployment rate and the upliftment of businesses within the Local Municipality.
- Failure to contribute to the reduction in GHG emissions.

The no-go alternative means that the negative impacts environmental impacts associated with the construction and operation of the powerline and the Solar Plant will not be realized.

## 6.2 ACTIVITY ALTERNATIVES

According to DEAT, 2004, consideration of activity alternatives entails changing the proposed activity to meet the same need. The no-go alternative can also be assessed under these alternatives. These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans, and programmes as well as projects. Consideration of such alternatives requires a change in the nature of the proposed activity. (DEAT: 2004d)

Power can be transmitted by either overhead power lines or underground power lines. The advantages and disadvantages of installing the underground cable or the overhead power lines are discussed in the table below. These are mainly related to magnetic fields, engineering and costs.

**Table 6-2:** Comparison of Overhead line vs Underground cables

| TYPE               | ADVANTAGES  | DISADVANTAGES  |
|--------------------|---|--|
| <b>Underground</b> | <ul style="list-style-type: none"> <li>» Minimal visual impact due to being below the ground.</li> <li>» Have lesser losses.</li> </ul> | <ul style="list-style-type: none"> <li>» The cost of underground cables, including the laying of the cables, is higher than overhead lines.</li> </ul> |

| TYPE            | ADVANTAGES  | DISADVANTAGES   |
|-----------------|---|---|
|                 | <ul style="list-style-type: none"> <li>» Lines are less affected by extreme weather conditions, thereby increasing power supply reliability.</li> </ul>   | <ul style="list-style-type: none"> <li>» Finding and repairing the wire breaks in case of system failure is challenging and time-consuming.</li> <li>» Underground system maintenance is complex due to the underground cabling.</li> <li>» Lines cannot be updated to increase the capacity.</li> <li>» Underground cables are subjected to damage due to ground movement due to earthquakes.</li> </ul> |
| <b>Overhead</b> | <ul style="list-style-type: none"> <li>» Lines are easy to repair and maintain.</li> <li>» Lines are not restricted by landscape i.e., they can be easily installed over rivers, roads, or hilly regions.</li> <li>» Cheaper to construct compared to underground.</li> </ul> | <ul style="list-style-type: none"> <li>» Lines have a visual impact.</li> <li>» Lines are susceptible to terrorism, vandalism and lightning.</li> <li>» Lines may have an impact on birds and aircraft.</li> </ul>  |

Based on the high cost and maintenance aspects, underground cables were not considered viable to evacuate power from the Solar Plant to RWB Substation.

### 6.3 DESIGN ALTERNATIVES

Weight and susceptibility to natural and human-induced conditions are essential in distinguishing and determining characteristics of various tower sizes. The towers will be determined after the route has been finalized at the final design stage. The towers that are being considered are listed below and reference is made to Figure 2-1:

- Guyed mono pole strain structures 7615.
- Intermediate mono pole structures 7611.
- Suspension mono pole structures 7649.
- Self-supporting lattice structures (both strain and suspension) 248.

### 6.4 ADVANTAGES AND DISADVANTAGES OF THE PROPOSED PROJECT

Some of the advantages of implementing this project are notable:

- i. Access to electricity within the region will catalyze economic development, thereby creating more jobs, generating disposable income and other benefits which ultimately lead to poverty reduction.

- ii. Improvement in electricity supply and grid stability.
- iii. The development of the overall project (Solar Plant and power line) will contribute to reducing greenhouse gas emissions, which aligns with the government's goal to transition South Africa toward a low-carbon, resilient economy and society by 2050.
- iv. Community development projects, skills training, and business development services for new and existing small businesses which will create jobs.

Some cumulative negative impacts include a loss of use of agricultural land, damage to habitat and fauna, erosion due to loss of ground cover, and the transformation of sensitive areas such as rivers, wetlands, and streams.



## 7 PUBLIC PARTICIPATION PROCESS

(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.

(g) (iii) a summary of the issues raised by interested and affected parties, and an indication of the way the issues were incorporated, or the reasons for not including them;

### 7.1 INTRODUCTION

Public Participation Process (PPP) is viewed as empowering communities and stakeholders in their efforts to safeguard the resource-base in more efficient ways and use the resources sustainably. It also enables people to play lead roles in identifying, designing, directing and implementing any development activity which impacts their immediate environment and, therefore, their way of life. When undertaking an EIA project, the public participation process is undertaken in terms of the Regulations set out in Chapter 6 of the EIA Regulations, Government Notice R326 of April 2017 as amended. The activities carried out as part of the process are as follows:

- *Section 40 – all registered Interested and Affected Parties (I&APs) are given 30 days to submit comments on generated reports.*
- *Section 41 – the person conducting a PPP must give notice to all IAPs by fixing notice boards, providing written notice and placing advertisements in local newspapers and provincial/national newspapers.*
- *Section 42 – open and continuously maintain a register of Interested and Affected Parties (IAPs).*
- *Section 43 – all registered IAPs are entitled to comment on all reports and the person conducting the PPP must ensure that comments raised are brought to the attention of the proponent or applicant.*
- *Section 44 – the person conducting the PPP must ensure that comments of IAPs and records of meetings are recorded and responded to. The comments and responses report must be attached to the reports that are submitted to the competent authority.*

### 7.2 OBJECTIVES AND APPROACH TO THE PPP

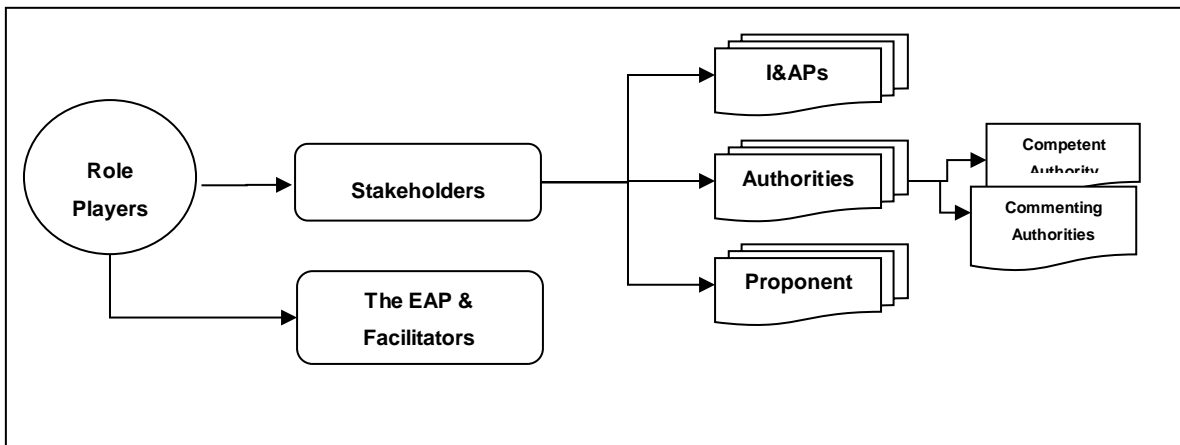
The objectives of the PPP are:

- ❑ To gather input from Interested and Affected Parties (I&APs) regarding the level and nature of their interest to better plan public participation activities related to the EIA.
- ❑ To obtain local knowledge from the public to enhance our understanding of the environmental, cultural and socio-economic setting of the proposed project for use in the EIA.

- ❑ To understand the reasons behind the views of the public regarding the potential environmental impacts.
- ❑ To solicit public input or views regarding potential alternatives and mitigation measures to reduce environmental impacts.
- ❑ To work with the public to resolve a specific issue.
- ❑ To obtain public comments on all project documentation to verify whether the information in the report is accurate, representative and adequate.
- ❑ To provide feedback to Interested and Affected Parties about how their input, views, issues and concerns have been considered in the process.
- ❑ To inform the public about the Competent Authority's (DFFE) decision and the next steps to follow.

### 7.3 METHODOLOGY ADOPTED

The Public Participation Process entails that all stakeholders that might be affected or have an interest in the proposed project be allowed to participate in the impact assessment of the project and they must each realize that they have responsibilities. See Figure 7-1 and 7-2 for the role of the Interested and Affected Parties (I&APs), the EAP and the Competent Authority (CA):



**Figure 7-1:** Role Players in the PPP

#### The Proponent:

- Provide adequate information to the Authorities, the EAP and to I&APs
- Adopt an open and transparent attitude during the interaction with I&APs
- Understand that the EAP acts independently and objectively in order to improve communication between I&APs and the Proponent
- Have empathy and patience with I&APs who do not possess the relevant background knowledge
- Avoid raising unrealistic expectations

#### I&APs:

- Register as an I&AP and advise the EAP about other I&APs who should be consulted
- Engage according to the agreed procedures and time frames
- Representatives of landowners and other organizations must ensure that their views are of their members and not their own
  - Avoid making unrealistic demands and provide appropriate information
  - Assist in identifying and prioritizing issues that need to be investigated and verify that issues have been recorded and considered

#### The EAP/PP Team:

- Communicate with all I&APs in order to provide them with information to enable them to participate in a meaningful way
- Organize all the required PPP activities
- Record and process the inputs, comments and issues received from I&APs
- Ensure that I&APs inputs are integrated into the reports which are communicated to the competent authority
- Avoid raising unrealistic expectations and undue fears



#### Competent Authority:

- Ensure that the requirements for decision-making do not limit the rights of stakeholders to engage adequately in the process
  - Where appropriate, ensure that the Proponent appointed an independent EAP
  - Allow adequate time for stakeholder engagement
  - Provide a decision on the application
  - Allow for stakeholders to appeal against the decision

**Figure 7-2: Role Players**

## **7.4 SUMMARY OF PP ACTIVITIES UNDERTAKEN**

The following PPP activities were carried out per Section 39-44 of the EIA Regulations as amended:

### **7.4.1 Stakeholder Identification**

The following methodology was used to identify stakeholders and Interested and Affected Parties:

- A locality map was compiled to identify the farms where the power line alternatives traverse. This was further verified on the Department of Rural Development and Land Reform cgs (property search) site. Information with regards to landowner information was sourced from Windeed.
- A review of the stakeholder database developed during the EIA for Lethabo Solar Plant.
- Networking and liaising with the Metsimaholo Local and Fezile Dabi District Municipalities.

The developed database includes stakeholders from:

- Landowners.
- National, Provincial and Local Government.
- Non-Governmental Organizations.
- Business, Industry & Tourism.

The stakeholder database attached in Appendix F-4 will be updated throughout the Basic Assessment Process.

---

### 7.4.2 Notification

Stakeholders and IAPs were notified about the project through the Background Information Document (BID) and site notices. Reference is made to the BID, proof of notification and site notices attached in Appendix F-1, F-2 and F-3, respectively. Visiting municipal offices and liaising with the ward councillor and committees also helped the PPP Team to establish the preferred consultation process in the area. An advert will also be placed in the local newspaper to notify the Interested and Affected Parties about the project and the availability of the Draft Basic Assessment Report.

Comments in relation to wayleaves have been received from Randwater and Telkom (openserve) and these have been recorded in the Comments and Response Report attached in Appendix F-6.

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### 7.4.3 Newspaper Advertising

Adverts have been published in the Sowetan and the Vaalweekblad newspapers on the 14<sup>th</sup> of July 2023 to notify the public about the availability of the draft Basic Assessment Report and attachments for review, the date and venue for a public meeting. Reference is made to Appendix F-5.

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### 7.4.4 Meetings

Meetings will be held with the stakeholders and IAPs during the public review period. Comments and responses to issues raised will be recorded in the Comments and Response Report.

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### 7.4.5 Public review of DBAR and EMPr

As part of the process to review the DBAR and EMPr registered IAPs will be given 30 days to comment on the DBAR and EMPr. Written comments that will be received from stakeholders will be recorded in the Comments and Response Report.

## 8 ENVIRONMENTAL SETTING

This section of the report details the information required as per Section 3(1)(g)(iv) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

This information is provided as a baseline to ensure an understanding of the possible impacts of the proposed development on the environment. As such, aspects of the biophysical and socio-economic environment that the project could directly or indirectly impact have been discussed. This information has been sourced from existing information such as the previous EIA reports, SDFs and IDPs for the Metsimaholo local municipality and Fezile Dabi district municipality, the site and the specialists' assessments. A more detailed description of each aspect of the affected environment is included in the specialist reports. The specialists commissioned are given in the table below:

**Table 8-1: Project Specialist Team**

| Theme                                 | Consultant                          |
|---------------------------------------|-------------------------------------|
| Archaeology                           | Vhubvo Archaeo-Heritage Consultants |
| Avifauna                              | Feathers Environmental Services     |
| Hydrology and Floodline Determination | Zara Capital                        |
| Palaeontology                         | Vhubvo Archaeo-Heritage Consultants |
| Terrestrial Biodiversity              | Envirosheq Consulting               |
| Wetlands                              | Envirosheq Consulting               |

### 8.1 CLIMATE

#### 8.1.1 Rainfall and Evaporation

Rainfall data was obtained from the Department of Water and Sanitation (DWS) online database, specifically from the Water Resources of South Africa 2005 Study (WR2005, 2009). The mean annual temperature within the Upper Vaal Water Management Area (WMA) ranges from 1°C to over 28°C in the northern and eastern parts, with maximum temperatures occurring in January (24°C to 30°C) and minimum temperatures in July (-2°C to 2°C), resulting in an average temperature of 25.5°C. Frost is a typical occurrence during winter, with an average of 30 to 50 frost days around the Lethabo Power Station.

The mean annual rainfall in the Upper Vaal WMA decreases uniformly in a westerly direction, with a predominantly seasonal pattern occurring mainly from October to April during the summer months, with over a 26% chance of a given day being wet. December and January are the peak rainfall months, with an average of 16.3 days receiving at least 96mm of precipitation.

Convective thunderstorms and hail accompanied the rainfall, with December having the highest probability of 51%. The mean annual precipitation (MAP) varies from 500 mm in the plains zone to 1000 mm at higher elevations, with an average of 700 mm around the site. The relative humidity is higher in summer than in winter, with February having the highest humidity (daily mean ranging from 65% in the west to 70% in the east) and August having the lowest (daily mean ranging from 55% in the west to 62% in the east). The average potential Mean Annual Gross Evaporation (MAE) is around 1,700mm in the western areas of the site.

The rainfall station selected to represent the study site is SAWS station 0438734\_W (VILJOENSDRIFT), located approximately 5.7 km southwest of the site with a rainfall record length of 94 years. The rainfall records show a mean annual precipitation (MAP) of 629 mm, which will be adopted for the site. Table 8-2 presents the average monthly rainfall and evaporation data adopted for the site.

**Table 8-2: Average Monthly Rainfall and Evaporation**

| Month            | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep  | Oct  | Nov  | Dec  | Annual |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|--------|
| Rainfall (mm)    | 90  | 74  | 57  | 30  | 13  | 5.7 | 2.6 | 6.5 | 17.8 | 53.9 | 78.9 | 89.2 | 629    |
| Lake Evaporation | 198 | 197 | 209 | 198 | 170 | 161 | 129 | 180 | 87   | 97   | 135  | 168  | 1700   |

## 8.2 SOILS

The elevation of the area ranges from 1440 to 1480 m above mean sea level (amsl) and slopes gently to the northeast with slopes ranging from 0-9%. Areas are classified into land types based on their slope, soil type and depth and underlying geology. The area is characterized by plinthic catena: undifferentiated, upland duplex and/or marginalitic soils common with a Ca 1 landtype. Reference is made to the Soil Map overleaf. Plinthic soils consist of an orthic A horizon which grades into a soft or hard plinthic horizon either directly via a red apedal B, yellow brown apedal B or E. The clay content is less than 15%.

Land capability classes are interpretive groupings of land with similar potential and limitations or similar hazards. It is determined by the collective effects of soil, terrain and climate features and shows the most intensive long-term use of land for rain-fed agriculture. It also indicates the permanent limitations associated with the different land-use classes Land capability in within the corridor and its surrounds is categorised as Class III: marginal potential arable land, with moderate to severe limitations.

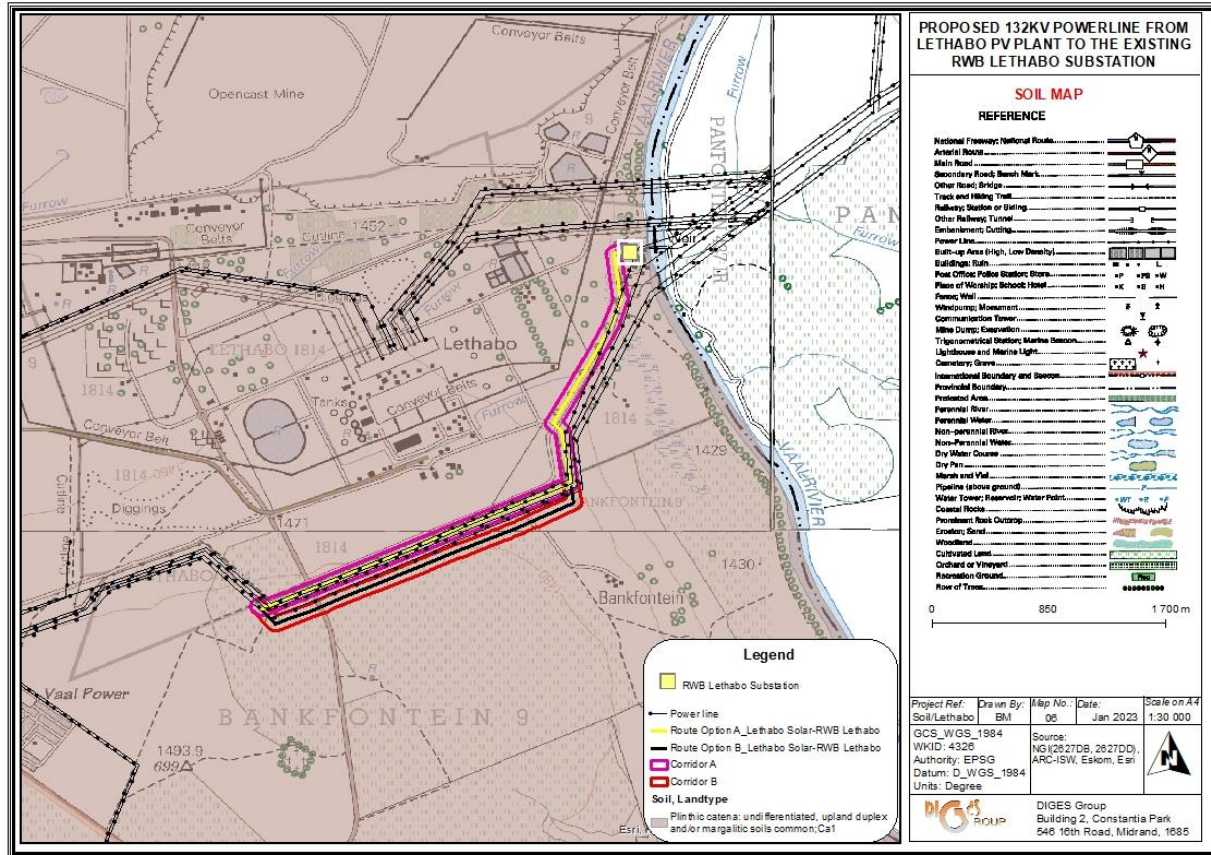
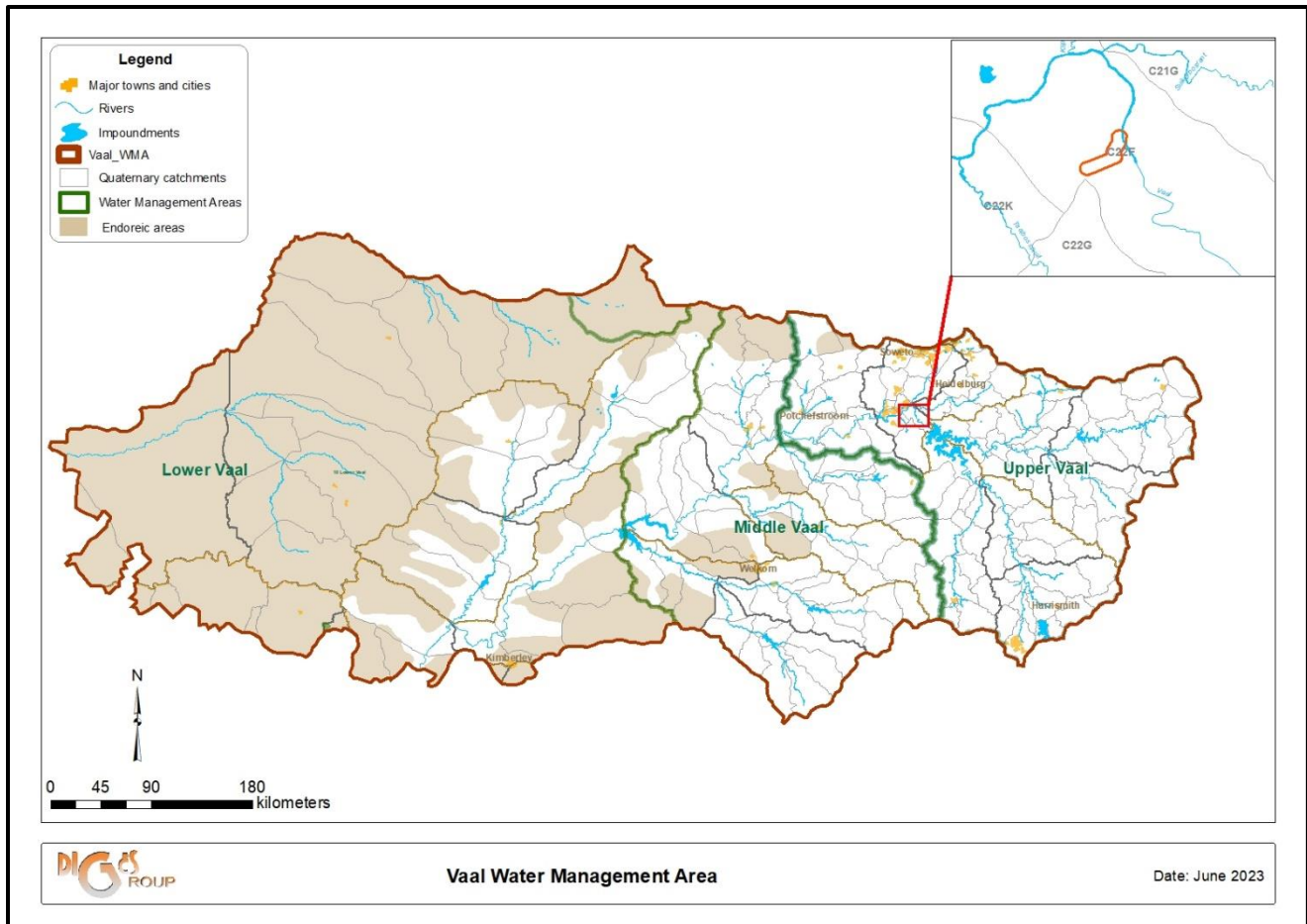


Figure 8-1: Map indicating the soil and land type in the project area.

### 8.3 REGIONAL HYDROLOGY

The proposed construction area is situated within the quaternary catchment C22F, which has a gross total catchment area of 440 km<sup>2</sup> and a net mean annual runoff (MAR) of 11 mm<sup>3</sup>. C22F receives runoff contributions from the upstream catchments of C22E, C22G, and C22L, which are all part of the Upper Vaal Water Management Area (WMA 5). The primary river within the C22F catchment is the Vaal River, fed by the Klip River located upstream. The water quality within the Vaal River is variable, with poor water quality in developed regions and better water quality in less developed areas. The land use within the C22F catchment encompasses a range of activities, including agriculture, extensive gold and coal mining, power generation, and industrial operations.

The average elevations at the eastern and western boundaries of C22F range from approximately 1843 m.a.s.l in the east to about 1275 m.a.s.l in the vicinity of the Vaal Barrage to the west. The elevation along the proposed construction site drops gradually to about 1489 m.a.s.l. Figure 8-2 indicates the hydrological setting of the proposed construction site.



**Figure 8-2: Vaal Water Management Area**

Table 8-3 summarizes the surface water characteristics of the C22F quaternary catchment, including the Mean Annual Precipitation (MAP), Mean Annual Runoff (MAR), and Mean Annual Evaporation (MAE). These values were obtained from the Water Resources of South Africa 2018 Study (WR2018).

**Table 8-3: C22F quaternary catchment**

| Quaternary Catchment | Catchment Area km <sup>2</sup> | MAE (mm) | Evaporation Zone | Rainfall Zone | MAP (mm) | MAR (mm <sup>3</sup> ) |
|----------------------|--------------------------------|----------|------------------|---------------|----------|------------------------|
| C22B                 | 440                            | 1700     | 5A               | C             | 655      | 11.95                  |

The Vaal River is classified as perennial, and it is widely observed that surface water flow events occur seasonally and continuously throughout the site catchment. The flow characteristics of the river vary throughout its course, influenced by factors such as rainfall patterns, land use, and dam operations.



## 8.4 GEOLOGICAL CONDITIONS

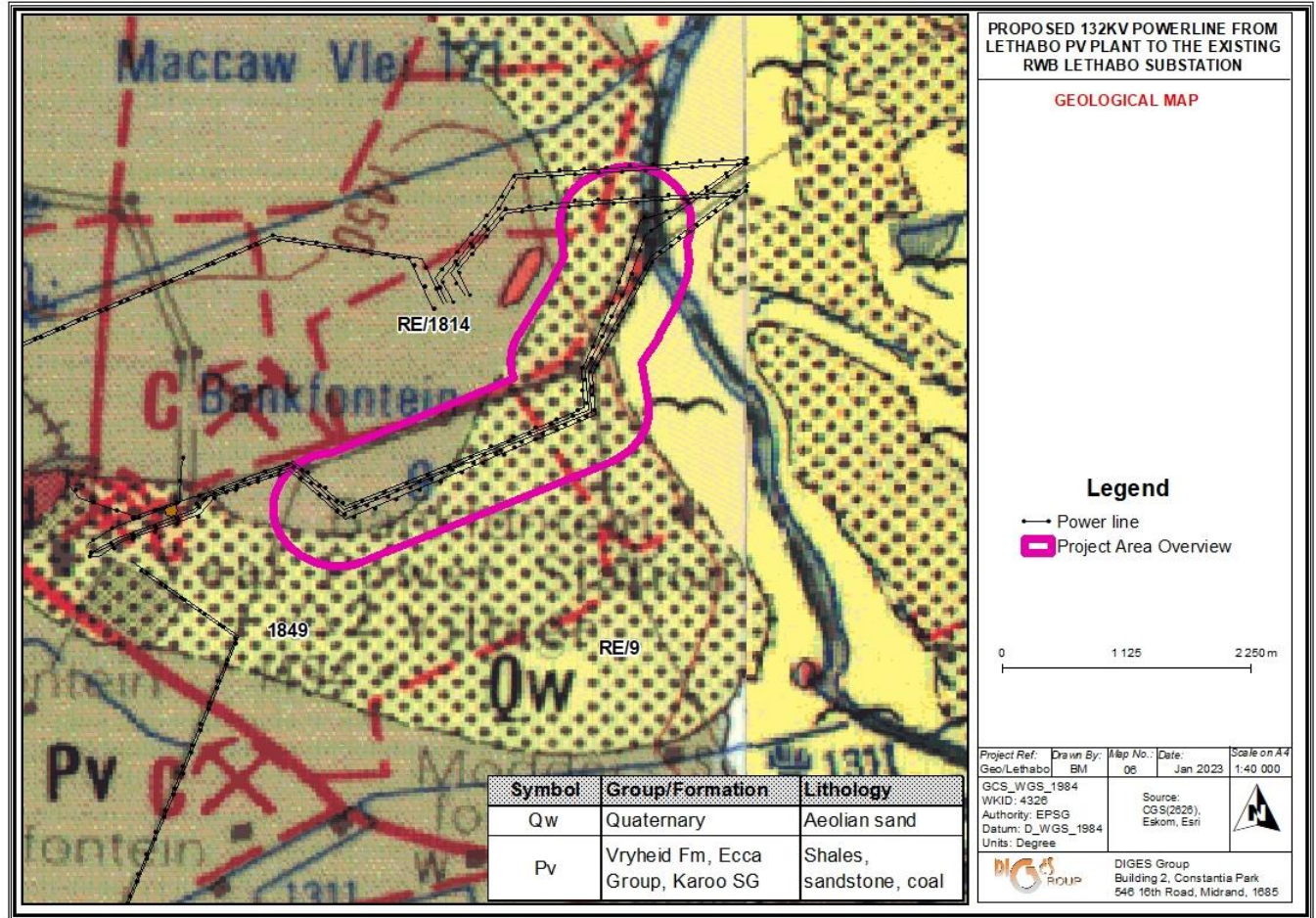
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### 8.4.1 Lithostratigraphy

The project area is underlain by rocks of the Early Permian Vryheid Formation. The Karoo Supergroup rocks cover a very large proportion of South Africa and extend from the northeast (east of Pretoria) to the southwest and across to almost the KwaZulu Natal south coast. It is bounded along the southern margin by the Cape Fold Belt and along the northern margin by the much older Transvaal Supergroup rocks. Representing some 120 million years (300 – 183Ma), the Karoo Supergroup rocks have preserved a diversity of fossil plants, insects, vertebrates and invertebrates.

During the Carboniferous Period South Africa was part of the huge continental landmass known as Gondwanaland and it was positioned over the South Pole. As a result, there were several ice sheets that formed and melted, and covered most of South Africa (Visser, 1986, 1989; Isbell et al., 2012). Gradual melting of the ice as the continental mass moved northwards and the earth warmed, formed fine-grained sediments in the large inland sea. These are the oldest rocks in the system and are exposed around the outer part of the ancient Karoo Basin and are known as the Dwyka Group. They comprise tillites, diamictites, mudstones, siltstones and sandstones that were deposited as the basin filled (Johnson et al., 2006).

Overlying the Dwyka Group rocks are rocks of the Ecca Group that are Early Permian in age. There are eleven formations recognised in this group, but they do not all extend throughout the Karoo Basin. In southern Gauteng, the Free State and KwaZulu Natal, from the base upwards are the Pietermaritzburg Formation, Vryheid Formation and the Volksrust Formation. All these sediments have varying proportions of sandstones, mudstones, shales and siltstones and represent shallow to deep water settings, deltas, rivers, streams and overbank depositional environments. Recent weathering and erosion have resulted in the deposition of much younger sands, soils and alluvium, particularly in low-lying catchments and long river valleys. These sediments are of Quaternary age. The geology is shown in the map below.



## 8.5 FLORA & FAUNA

### 8.5.1 Flora

The threat of an ecosystem status defines the degree to which an ecosystem is still intact or has lost some of the vital aspects of its structure, function or composition. The proposed power line is within the Central Free State Grassland (Gh6) of the grassland biome. A detailed Terrestrial Biodiversity Report is attached in **Appendix E-5**. The vegetation type is discussed below and the National Biodiversity Assessment, terrestrial remnants 2018 dataset was utilized to identify the remaining vegetation type.

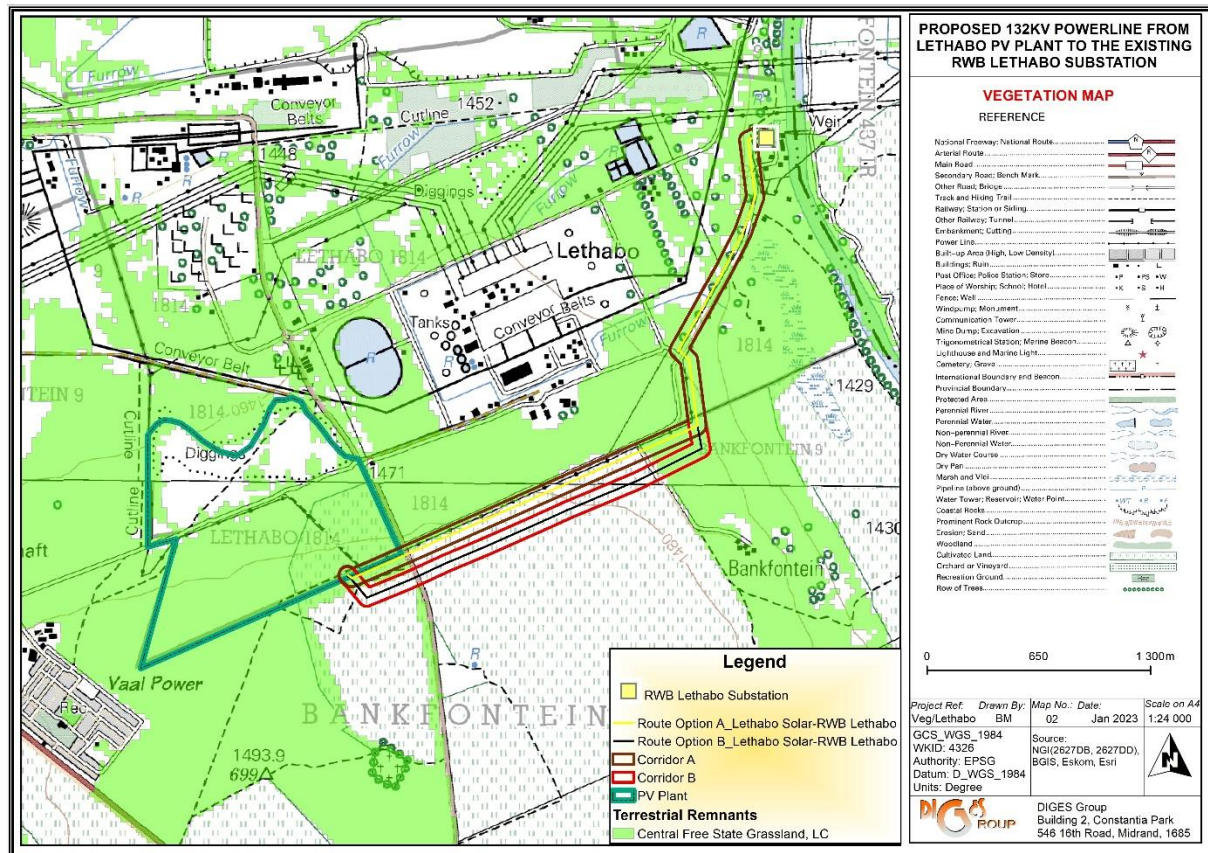


Figure 8-3: Vegetation types within the project area

### 8.5.1.1 Central Free State Grassland (Gh6)

**Distribution** - Free State Province and marginally into Gauteng Province: A broad zone from around Sasolburg in the north to Dewetsdorp in the south. Other major settlements located within this unit include Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley and Edenville. Altitude 1 300–1 640 m, most of the area at 1 400–1 460 m.

**Vegetation & Landscape Features** - plains supporting short grassland, in natural condition dominated by Themeda triandra while Eragrostis curvula and E. chloromelas become dominant in degraded habitats. Dwarf karoo bushes establish in severely degraded clayey bottomlands. Overgrazed and trampled low-lying areas with heavy clayey soils are prone to Acacia karroo encroachment.

**Important Taxa**-Graminoids: Aristida adscensionis (d), A. congesta (d), Cynodon dactylon (d), Eragrostischlo-romelas (d), E. curvula (d), E. plana (d), Panicum coloratum (d), Setaria sphace- lata (d), Themeda triandra (d), Tragus koelerioides (d), Agrostis lachnantha, Andropogon appendiculatus, Aristida

bipartita, *A. canescens*, *Cymbopogon pospischilii*, *Cynodon transvaalensis*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis lehmanniana*, *E. micrantha*, *E. obtusa*, *E. racemosa*, *E. trichophora*, *Heteropogon contortus*, *Microchloa caffra*, *Setaria incrassata*, *Sporobolus discosporus*. Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Conyza pinnata*, *Crabbea acaulis*, *Geigeria aspera* var. *aspera*, *Hermannia depressa*, *Hibiscus pusillus*, *Pseudognaphalium luteo-album*, *Salvia stenophylla*, *Selago densiflora*, *Sonchus dregeanus*. Geophytic Herbs: *Oxalis depressa*, *Raphionacme dyeri*. Succulent Herb: *Tripteris aghillana* var. *integrifolia*. Low Shrubs: *Felicia muricata* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *Melolobium candicans*, *Pentzia globosa*.

**Conservation** Vulnerable. Target 24%. Only small portions enjoy statutory conservation (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) and some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by the building of dams (Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede). No severe infestation by alien flora has been observed, but the encroachment of dwarf karoo shrubs becomes a problem in the degraded southern parts of this vegetation unit. Erosion is low (45%), moderate (30%) or very low (20%).

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#### 8.5.1.2 Vegetation within the site

Corridor A and Corridor B have undergone vegetation transformation due to current and historical activities. Large areas of secondary grassland are also present due to edge effects associated with these activities, such as woody encroachment and fire frequency and intensity alteration. Thus, three habitat units are present in the study area or close to the boundary of the study site, namely the Transformed / Degraded Habitat Unit, the Secondary grassland Habitat Unit and the Wetland Habitat Unit. The section closes to the Ash Resources Area where the line crosses the road towards the RWB substation is characterised of tall stands of eucalyptus and a dense layer of grass species. A permit (50922220907140510) has been issued for restricted activities of alien species or listed species for various alien species such as acacia and eucalyptus.



**Figure 8-4: Grassland near the corridor**



**Figure 8-5: Grassland within the corridor (view from the substation)**



**Figure 8-6: Eucalyptus within the corridor**

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### 8.5.2 Avifauna

(Excerpt from the Avifauna Report)

Important Bird Areas (IBA) are sites that have been carefully identified based on the bird numbers and species complements they hold (i.e., globally threatened, range restricted and or migratory or congregatory species). IBAs are selected such that, taken together, they form a network throughout the species' biogeographic distributions. IBAs are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network. The proposed 132kV power line is located within 50km of the Suikerbosrand Nature Reserve IBA, and several species of conservation concern occur within this IBA.

A total of 246 bird species have been recorded within a radius of 2 km from the proposed 132kV power line PAOI pentads during the SABAP2 atlasing period to date. The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur along the proposed power line alignment. Of the 246 species, 13 are regional Species of Conservation Concern (SCC). Relevant to this development, 72 species are classified as power line sensitive species. Of the power line sensitive species, 38 are likely to occur regularly within the PAOI and are largely comprised of water dependent species that

may traverse across the PAOI. Only 12 of these species are likely to occur regularly within the proposed 132kV power line corridor. A detailed Avifauna Impact assessment is attached in **Appendix E-2**.

## 8.6 CRITICAL BIODIVERSITY PLAN

The dataset for the Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) was sourced from SANBI BGIS. The map was compiled by the Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA) as part of the systematic biodiversity planning process. CBAs are areas that are important for conserving biodiversity while ESAs are areas that are important to ensure the long term persistence of species or functioning of other important ecosystems. Degradation of CBAs or ESAs could potentially result in the loss of important biodiversity features and/or their supporting ecosystems. The study area is not within any Critical Biodiversity Areas (CBAs) however all the sites are located within Ecological Support Area (ESA). The table below indicates the percentage of the ESA1 and ESA2 within the two corridors over the total corridor areas. It however constitutes less than 0.1% of the total ESA1 and ESA2 within the province. The map below shows the distribution of the two categories within the corridors.

**Table 8-4: CBA Categories**

| CBA MAP CATEGORY               | DESCRIPTION   | % COVERAGE |
|--------------------------------|---|------------|
| Ecological Support Area (ESA1) | Areas that are important for maintaining the ecological processes on which CBAs depend. These are largely natural areas with minimal degradation.   | 55         |
| Ecological Support Area (ESA2) | These areas are no longer intact but potentially retain significant importance from a process perspective, i.e., sites are those with degradation, i.e., they can be totally degraded, but not totally transformed. | 45         |

## 8.7 LAND USES

The table below describes the land uses within and surrounding project area:

**Table 8-5: Surrounding Land-Uses**

| LAND USE         | DESCRIPTION   |
|------------------|---|
| Heavy industrial | This includes the adjacent Lethabo Power Station, open cast mining areas to the southwest and northwest of the proposed alternative corridors whilst Sasol refinery in Sasolburg is 15km southwest. |

| LAND USE                                     | DESCRIPTION  |
|--|--|
| Power lines                                  | Due to the presence of Lethabo Power Station and RWB substation, the area is characterized by powerlines of different capacity.  |
| Settlements                                  | Small villages, in the vicinity of Sasolburg, also form part of the Metsimaholo Region. These villages are privately managed. The legal status of these villages is that of a single erf and mining related companies administer the majority. |
| Riverine Corridor Landscape Character Areas. | The Vaal River is within 800m of the corridors.  |
| Transportation                               | The area is accessed via the R716 and Dihlabakela road which are tarred. There is also a railway line that terminates at the power station   |

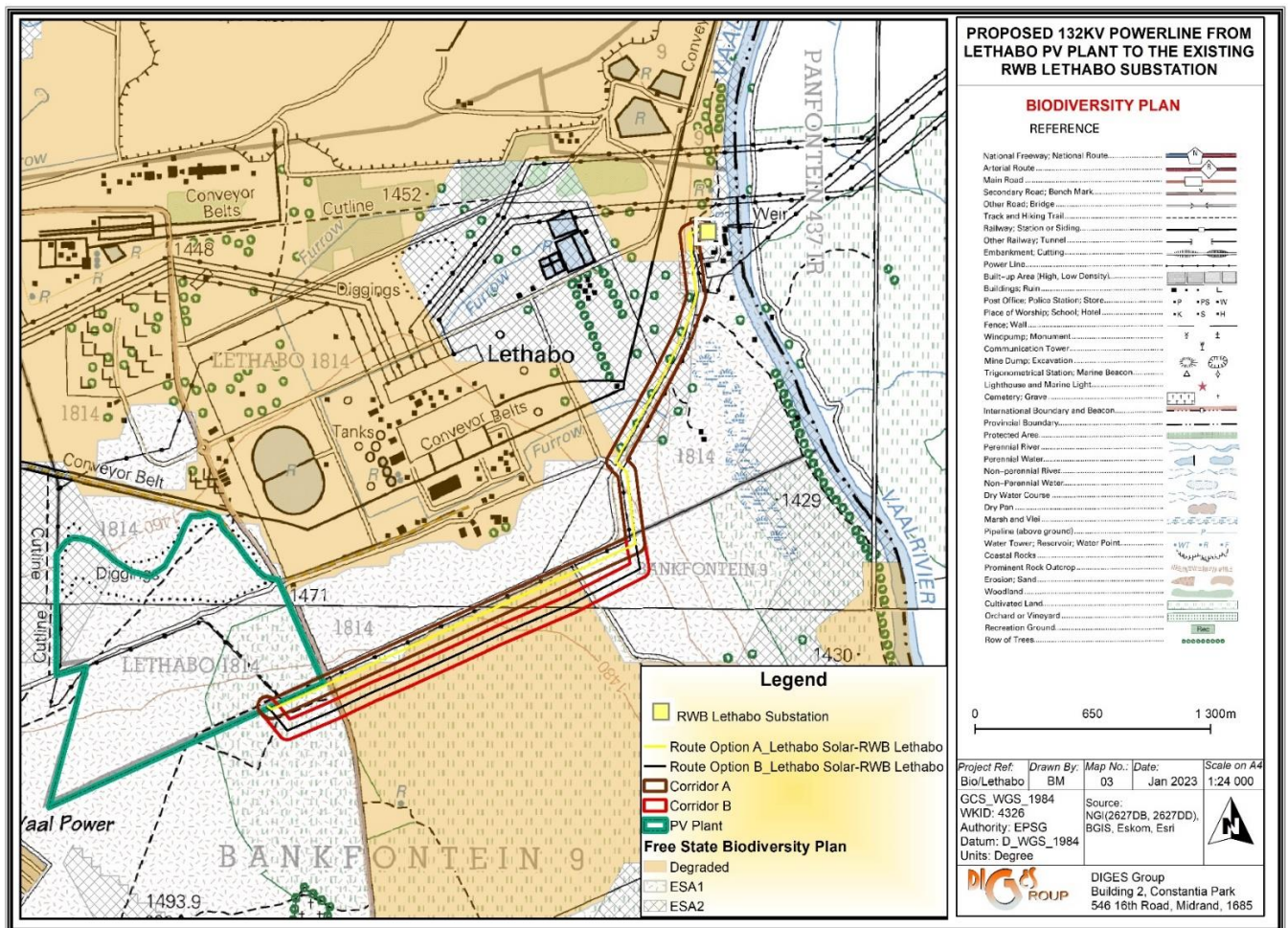


Figure 8-7: Ecological Support Areas within the site



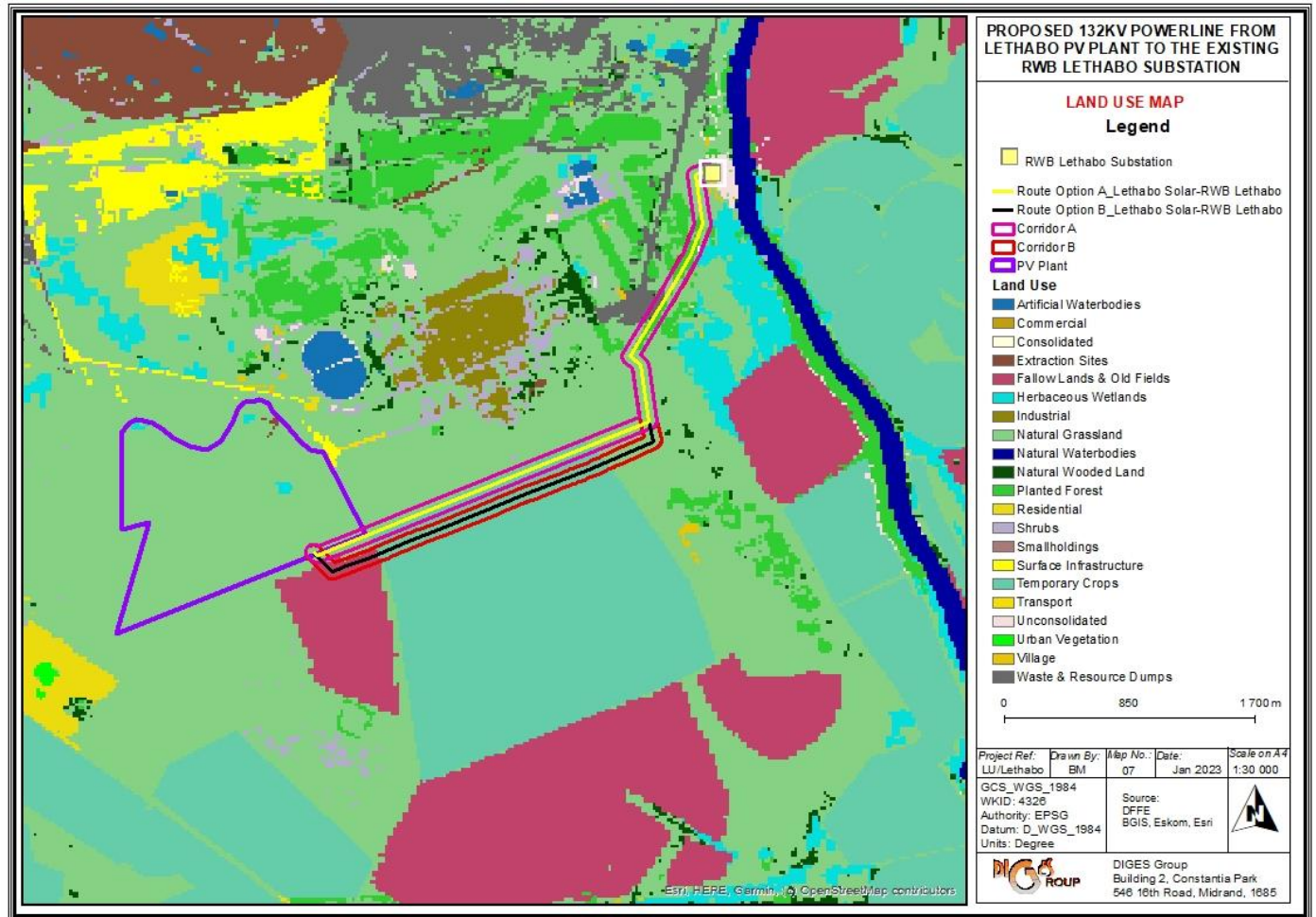


Figure 8-8:- Land use within the area

## 8.8 VISUAL ENVIRONMENT

The proposed development will take place within a landscape already heavily impacted by large-scale industrial development, including mining operations and the Lethabo Power Station. Reference is made to the Visual impact Assessment done by Afzelia for the Lethabo Solar Plant. The development within the study area can be divided into the following types.:

- **Industrial Development** includes the adjacent Lethabo Power Station, open cast New Vaal Mine and Copper Sunset Mine to the northwest and southwest. Mittal Steel is north of Vereeniging, and the Sasol refinery in Sasolburg to the southwest. These activities include large industrial structures such as cooling towers, overhead conveyors and other industrial buildings that are visible over a wide area and have an overwhelming impact on landscape character from immediately adjacent areas but also influence landscape character over a wider area. The natural

landscape is highly degraded. There are alien trees, eucalyptus trees close to the Ash resources and the RWB substation that screen many lower elements.

- **Urban Development** includes Vereeniging and Vanderbijlpark north of the Vaal and Sasolburg to the southwest. These are relatively dense urban areas that are generally inward looking. Views of the broader landscape are generally only possible from the edges of the developed areas.
- **Agricultural Development** where the alternatives traverse and some small holdings located to the south of the authorized Lethabo Solar Plant and closer to the urban areas and larger farming units generally located to the south and east. Farms are generally a mixture of arable and pasture.

## 8.9 AIR QUALITY

The project area is within the Vaal Triangle Air-Shed Priority Area, which is a highly industrialized area housing industries, Lethabo Power Station, and various smaller industrial and commercial activities in addition to a few collieries and quarries giving rise to noxious and offensive gasses. The sources of air pollution within the project area and its surroundings are from the:

- Fugitive emissions from Lethabo from coal storage and handling, and ash handling.
- Emissions from coal burning at Lethabo power station result in the emission of pollutants such as particulate matter, sulphur dioxide, nitrogen oxides and mercury.
- Carbon monoxide and nitrogen oxides emissions from vehicles.
- Emission of dust and the fines containing coal particles, benzene soluble matters from open cast coal mining from the New Vaal mine.

## 8.10 SOCIO-ECONOMIC ENVIRONMENT

According to Tony Barbour, 2007, there is a need to understand the social environment and communities affected by the proposed development to ensure that positive benefits associated with the project are enhanced, and the negative impacts are avoided or mitigated. There is, therefore, a need to collect baseline data on the current social environment and historical social trends. This section, therefore, covers the socio-economic profile of the area at a local and regional level. The Fezile Dabi District Municipality and Metsimaholo Local Municipality Integrated Development Plans were consulted.

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### 8.10.1 Population

The population is the number of individuals who live within a specified area. The table below indicates that in 2016, Metsimaholo Municipality had a total population of 163 164 which is higher than the other three Local municipalities under Fezile Dabi. The district profile further showed that most local municipalities had negative population growth except Metsimaholo, with a growth of 2,1% of Annual

Growth. However, the Fezile Dabi District generally has seen a positive population growth of 0,3% of Annual Growth.

| MUNICIPALITY   | CENSUS 2011 | COMMUNITY SURVEY 2016 | GROWTH RATE |
|----------------|-------------|-----------------------|-------------|
| Fezile Dabi    | 488 036     | 494 777               | 0.3         |
| Metsimaholo LM | 149 108     | 163 164               | 2.1         |
| Mafube LM      | 57 876      | 57 574                | -0.1        |
| Moqhaka LM     | 160 532     | 154 732               | -0.8        |
| Ngwathe LM     | 120 520     | 118 907               | -0.3        |

Source: Metsimaholo IDP, 2022

The Black African population has the highest with a total number of 122 697 (82,2%) followed by the Whites community with a total number of 24 390 (16,3%) respectively, whilst the coloured community constitutes 1070 (0,7%) and the less community as Indian/Asian with a total population of 477 (0,3%). Metsimaholo Local Municipality consists of most young people between the age of 0 – 34, who makes up 63% of the total municipal population, whilst adults between the ages of 35 and 64 make up 29% of the total population.

Household sizes in the Metsimaholo Municipality are smaller than in the Fezile Dabi District. In 2016, the average household size in the Metsimaholo Municipality was 3.31 people. This is expected to increase to 3.32 people in 2026 marginally.

Youth in the Municipal area constitutes 38.9% of the total population; Ward 1 (4 951) and Ward 20 (5 308) show the highest number, respectively. The working age (15-64) in Ward 18 constitutes 3% of the total Municipal population, whilst Ward 16 (567) and Ward 22 (444) have the highest number of older people. Older people constitute 4.3% of the total population in the Municipal area.

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## 8.10.2 Gender

Males comprise up 52% of the total municipal population, whilst females constitute only 48% of the total municipal population. In addition, the analysis done on gender constitution indicates that Wards 1 and 20 have the highest number of males (6 331 and 7 595 respectively) whilst Wards 6 and 12 have the lowest number of females (2 102 and 1 745 respectively). Both Wards 1 and 20 have the highest concentration of population, contributing 8,2% and 8,1%, respectively, to the total municipal population. Of note is that the project area (Ward 18) contributes 3.5% to the total municipal population. The table below shows the distribution of males and females within the municipality and Ward 18.

**Table 8-6: Gender**

| Area        | Male  | Female | Totals |
|-------------|-------|--------|--------|
| Metsimaholo | 77636 | 71472  | 149108 |
| Ward 18     | 2431  | 2131   | 5152   |

Source: Metsimaholo IDP, 2022

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### 8.10.3 Language

According to the 2016 Community Survey, the majority of Fezile Dabi District, **74.7%**, speak Sesotho, followed by Afrikaans at **11.9%**, while Xhosa, Zulu and English are **3.9%**, **4.1%** and **1.6%**, respectively. Whereas in Metsimaholo LM, Sesotho and Afrikaans are also the two dominant languages by **67.7%** and **15.1%**, with other languages contributing only **17.2%** of the total municipal population.

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### 8.10.4 Level of Education

Education is a platform for mass socioeconomic upliftment. A failure to access good quality education condemns people and future generations to the lowest rungs of society and a life of poverty (Sikhakhane, 2006). Education often competes with household survival when young people are forced to leave school to find employment or assist with subsistence activities. This compounds the cycle of poverty, for without skills or education, limited opportunities exist to escape from marginalised situations. [Free State SoE] The 2022 Municipal IDP indicates that 37 715 people have Grade 12 or equivalent education, whilst 12 453 people have obtained higher education qualifications. In total, 50 168 people have completed formal education. This constitutes 31% of the total municipal population, which is higher than the provincial average of 27%. Ward 18 accounts for 1.3% and 5% of the people with no education and those with higher education, respectively.

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### 8.10.5 Employment Profile

The municipality's economic growth potential is in agriculture and eco-tourism. Most people in the district derive their livelihood through agricultural pursuits. The main occupation sector is agriculture (commercial and subsistence), according to Census 2011. The total unemployment rate is 43.8%, and 58.3% is the youth, according to Census SA 2011. The information above depicts that the Municipal unemployment rate is at 32,1%, with Ward 13 as the highest, Ward leading with unemployment (47,8%) and Ward 1 with 43,2%. The unemployment rate in Ward 18 is 14%. The stats further show 23,5% (35 146) of people who are not economically active and 2,0% (3 008) of discouraged work seekers.

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### 8.10.6 Migration and Urbanisation

The spatial distribution of the MLM population indicates that more people are staying in urban areas than rural areas, and the majority are in urban townships and suburbs. Like provincial dynamics, the general tendency of migration from rural to urban areas is also occurring in Metsimaholo. Migration into the municipality is focused on Sasolburg, Deneysville and Orangeville areas due to the existing mining activities and the proximity of these areas to retail, factory, and industrial work opportunities better than those in the rural areas. It is envisaged that this trend will continue for the foreseeable future.

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### 8.10.7 Service Delivery and Dwellings

In 2011, 83.9% of households within the Municipality lived in formal dwellings, which increased to 87.5% in 2016. There was a significant decrease between 2011 and 2016 in all other forms of dwellings.

93.8% had piped water inside a dwelling/yard, whereas 0.9% of households had no piped water. 95.6% of households source their water from regional/local water schemes and none from springs. 79.1% of households with access to piped water inside a dwelling or yard have rated the municipality with good quality water service whereas 80.7% of households who access water from boreholes outside the yard rated the municipality with good quality water service.

86.4% of households had access to electricity, whereas only 0.2% had no access. 70.3% of households had access to electricity with an in-house meter, whereas none used batteries, solar systems or generators to access electricity. 64.9% of households with access to electricity with an in-house prepaid meter rated the municipality for good quality of electricity supply service, and 74.9% of households with other electricity access rated the municipality for good quality.

Households with flush/chemical toilet facilities have decreased from 76.0% in 2011 to 74.1% in 2016. Households without toilet facilities decreased from 1.3% in 2011 to 0.4% in 2016. In 2011, 12.7% of households were using their own refuse dumps, which increased to 14.4% in 2016, whereas households without any rubbish disposal increased from 3.5% in 2011 to 5.5% in 2016.

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### 8.10.8 Economic Profile

In 2019, the manufacturing sector is the largest within Fezile Dabi District Municipality accounting for R 14 billion or 27.0% of the total GVA in the district municipality's economy. The sector that contributes the second most to the GVA the Fezile Dabi District Municipality is the mining sector at 18.2%, followed by the community services sector with 13.1%. The sector that contributes the least to the economy of

Fezile Dabi District Municipality is the construction sector with a contribution of R 1.14 billion or 2.20% of the total GVA. The community sector, which includes the government services, is generally a large contributor towards GVA in smaller and more rural local municipalities. When looking at the regions within the district municipality, the Metsimaholo Local Municipality made the largest contribution to the community services sector at 40.09% of the district municipality. The Metsimaholo Local Municipality contributed R 34.6 billion or 66.47% to the GVA of the Fezile Dabi District Municipality, making it the largest contributor to the overall GVA of the Fezile Dabi District Municipality. This is due to the large petrochemical hub in Sasolburg and the related economic activities.

## 9 IMPACT PREDICTION AND ASSESSMENT

This section of the report details the information required as per Section 3(1)(g)(v) to (xi) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

- (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts—
  - (aa) can be reversed.
  - (bb) may cause irreplaceable loss of resources; and
  - (cc) can be avoided, managed or mitigated.
- (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.
- (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 geographical, physical, biological, social, economic, heritage and cultural aspects.
- (viii) the possible mitigation measures that could be applied and level of residual risk.
- (ix) the outcome of the site selection matrix.
- (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and
- (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.
  - (i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including—
    - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and
    - (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.

The impacts of the construction of the proposed power line and infrastructure are assessed based on the impact's magnitude and the receptor's sensitivity, culminating in impact significance for the most important impacts that require management. This section of the report evaluates the possible negative and positive impacts which may occur because of going ahead with the proposed project.

Risks and key issues were identified through an internal process based on similar developments and site visits. Reference is made to the Table below for the environmental aspects used to identify the significant impacts:

**Table 9-1: Identification of Significant Impacts**

| Environmental Feature                 | Component                        | Possible Construction effect envisaged? | Possible Post construction effect envisaged | Main effect? | Likely Significant Effect? | Comments/reason for inclusion or exclusion from further consideration                 |
|---------------------------------------|----------------------------------|---|---|--------------|----------------------------|---|
| <b>BIODIVERSITY (Flora and Fauna)</b> | Habitat types                    | Y                                       | Y   | Y            | Y                          | Loss of habitats  |
|                                       | Plant communities                | Y                                       | Y   | Y            | Y                          | Clearing of vegetation, including protected/species of conservation concern           |
|                                       | Animal communities               | Y                                       | Y   | Y            | Y                          | Habitat transformation can cause the displacement of animal/avifauna species.         |
|                                       | Conservation                     | Y                                       | Y   | Y            | Y                          | Potential effects on the conservation/ protected species.                             |
| <b>SOIL/LAND</b>                      | Erosion                          | Y                                       | Y   | Y            | ?                          | Earthworks to be carried out.   |
|                                       | Ground contamination             | Y                                       | Y   | Y            | ?                          | It is mainly caused by the spillage of hazardous substances.                          |
|                                       | Soils /agricultural land quality | Y                                       | Y   | Y            | Y                          | Loss of agricultural land and movement of soils.                                      |
| <b>LAND-USE</b>                       | Agriculture                      | Y                                       | N   | Y            | N                          | Loss of agricultural land   |
| <b>WATER ENVIRONMENT</b>              | Surface water quality            | Y                                       | Y   | Y            | Y                          | Pollution during construction and run-off from cleared areas                          |
|                                       | Groundwater quality              | Y                                       | Y   | Y            | Y                          | Pollution during construction and run-off from cleared areas                          |
| <b>WASTE</b>                          | Waste management                 | Y                                       | N   | N            | N                          | Waste generated during construction will need to be managed                           |
|                                       | Waste characteristics            | Y                                       | N   | N            | N                          | Waste generated changes from agricultural in some areas to construction waste.        |
| <b>AIR</b>                            | Local air quality                | Y                                       | N   | N            | N                          | Increased emission of NO <sub>2</sub> and PM <sub>10</sub> on the local road network. |
|                                       | Particulates and dust            | Y                                       | N   | N            | N                          | Dust generated during earthworks.   |
|                                       | Odor                             | Y                                       | N   | N            | N                          | Odor expected from waste and sanitation systems during construction.                  |
| <b>ARCHAEOLOGY</b>                    | Burial areas                     | N                                       | N   | N            | N                          | Graves within the corridor.   |



| Environmental Feature | Component                                | Possible Construction effect envisaged? | Possible Post construction effect envisaged | Main effect? | Likely Significant Effect? | Comments/reason for inclusion or exclusion from further consideration   |
|-----------------------|--|---|---|--------------|----------------------------|---|
|                       | Objects/buildings more than 60 years old | N                                       | N   | N            | N                          | Potential for buildings/ objects within corridor.   |
| <b>VISUAL</b>         | Landscape character                      | N                                       | N   | N            | N                          | Introduction of towers in highly sensitive landscape resulting in negative impacts on its character.          |
|                       | Landscape quality                        | Y                                       | Y   | N            | N                          | Eroding of landscape quality by inappropriate developments.   |
|                       | Land-cover                               | Y                                       | Y   | N            | N                          | Removal of vegetation   |
| <b>NOISE</b>          | Noise                                    | Y                                       | N   | N            | N                          | Noise will be generated during earthworks and construction.   |
|                       | Vibration                                | Y                                       | N   | N            | N                          | Potential for vibration.  |
| <b>SOCIO-ECONOMIC</b> | Employment                               | Y                                       | N   | Y            | Y                          | The development will create jobs within the local and regional areas.   |
|                       | Public health and safety                 | Y                                       | N   | Y            | N                          | Influx of workers may introduce diseases and the construction activities will result in accidents and thefts. |
|                       | Local environment amenity                | Y                                       | Y   | Y            | Y                          | The influx of construction workers may cause minimal constraints on local amenities                           |
|                       | Standard of living                       | Y                                       | N   | Y            | Y                          | Standard of living within the area may improve during the construction phase.                                 |

**Key:** Y=Yes N=No ? =Uncertain

## 9.1 CHARACTERISTICS OF ENVIRONMENTAL IMPACTS

The significance of an impact is an expression of the cost or value of an impact to society. Impacts are divided according to phases: pre-construction, construction and operation phases. The following parameters will be used to assess the identified environmental impacts:

**Table 9-2: Impact Assessment Methodology**

| The status of the impact                           |                                       |   |
|--|---------------------------------------|---|
| Status   | Description                           |   |
| Positive:  | a benefit to the holistic environment |   |
| Negative:  | a cost to the holistic environment    |   |
| Neutral:   | no cost or benefit                    |   |
| The duration of the impact                         |                                       |   |
| Score  | Duration                              | Description   |
| 1  | Short term                            | Immediate/ short term (less than 3 months)  |
| 2  | Medium term                           | Construction or decommissioning period  |
| 3  | Long term                             | For the life of the operation   |
| 5  | Permanent                             | Permanent   |
| The extent of the impact                           |                                       |   |
| Score  | Extent                                | Description   |
| 1  | Footprint                             | Within the site boundary  |
| 2  | Site                                  | Affects immediate surrounding areas   |
| 3  | Local                                 | Local area / district (neighbouring properties, transport routes and adjacent towns) is affected    |
| 4  | Regional                              | Extends to almost entire province or larger region  |
| 5  | National                              | Affects the country.  |
| The reversibility of the impact                    |                                       |   |
| Score  | Reversibility                         | Description   |
| 1  | Completely reversible                 | Reverses with minimal rehabilitation & negligible residual affects                                  |
| 3  | Reversible                            | Requires mitigation and rehabilitation to ensure reversibility                                      |
| 5  | Irreversible                          | Cannot be rehabilitated completely/rehabilitation not viable  |
|  |                                       |   |
| The magnitude (severe or beneficial) of the impact |                                       |   |
| Score  | Severe/beneficial effect              | Description   |
| 1  | Zero                                  | Natural and/or social functions and/or processes remain unaltered.                                  |
| 2  | Very Low                              | Natural and/or social functions and/or processes are negligibly altered.                            |
| 3  | Low                                   | Natural and/or social functions and/or processes are slightly altered and are reversible with time. |

|                                      |                 |  |
|--------------------------------------|-----------------|--|
| 4                                    | Moderate        | Natural and/or social functions and/or processes are notably altered and are reversible with rehabilitation. |
| 5                                    | High            | Natural and/or social functions and/or processes are permanently altered.                                    |
| <b>The probability of the impact</b> |                 |  |
| <b>Score</b>                         | <b>Rating</b>   | <b>Description</b>   |
| 1                                    | Unlikely        | The chance of this impact occurring is zero (0%).  |
| 2                                    | Possible        | May occur. The chances of this impact occurring is defined as 25%.   |
| 3                                    | Probable        | Likely to occur. The chances of this impact occurring is defined as 50%.                                     |
| 4                                    | Highly Probable | The chances of this impact occurring is defined as 75%.  |
| 5                                    | Definite        | Will certainly occurs. The chance of this impact occurring is defined as 100%.                               |
| <b>The Consequence</b>               |                 | = Magnitude + Extent + Duration + Reversibility.   |
| <b>The Significance</b>              |                 | = Consequence x Probability.   |

### 9.1.1 Significance

The potential impacts are assigned a significance rating (S), based on the information in the tables above. It indicates the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. The significance rating process follows the established impact/risk assessment formula given in the table below:

**Table 9-3: Significance Rating of Impacts**

| Score out of 100 | Significance     |
|------------------|------------------|
| 1 to 20          | Low              |
| 21 to 40         | Moderate to Low  |
| 41 to 60         | Moderate         |
| 61 to 80         | Moderate to high |
| 81 to 100        | High             |

## 9.2 DETERMINATION OF IMPACT SIGNIFICANCE

ISO 2001:2004 defines an impact as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspect, whilst an environmental aspect is defined as an element of an organization's activities or products or services that can interact with the environment. The project-related impacts have been identified as detailed in Section 9.1 and will be assessed as per the criteria specified in Section 9.1 and Tables 9.2 and 9.3 above. The assessment of the identified impacts considers the specialists' assessments, the EAP's professional experience concerning the proposed development and legislative requirements. Of note is that there is little differentiation between the powerline corridor alternatives assessed, as they are near and 300m apart. The tables below, therefore, assess the impact of the activities on the project area. The mitigation measures in the tables below are not exhaustive, as they are fully discussed in the EMPr attached in Appendix G.

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### 9.2.1 Cumulative Impacts

Cumulative impacts entail identifying additional projects, activities, or disturbance features near the project—past, present, and future projects that may have impacts that could combine with the residual project impacts to increase environmental impact. This is done by reviewing the historical activity records, geographic data indicating existing disturbance features and the observation and knowledge of ongoing activities. Projects anticipated to be completed in the future include those that are now underway or have already started the Environmental Authorisation (EA) process, any permitting applications, or those that have been issued the required permits. Based on the above, the following developments have been noted within 5 km of the site.

#### **Existing**

- Lethabo Power Station and associated infrastructure, such as the Ash Resource
- New Vaal Colliery Mine
- Copper Sunset Sand who are mining sand
- Agricultural activities
- Small mining settlements.
- Recreational Activities at the Vaal River (Aqua Vaal Hengel Klub)
- Electrical infrastructure such as power lines and the substation.

During the site inspection, maintenance was being done on Dihlabakeng and R716 roads. In addition, the Lethabo Solar PV Plant has been authorized, and plans are underway to undertake construction activities.

## 9.2.2 Planning

All legislative requirements should be adhered to, and the necessary permits and authorisations such as Environmental and General Authorisations.

## 9.2.3 Biodiversity

**Table 9-4: Flora**

| <i>Phases</i><br>Construction  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i>               |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|-----------------------------------|
| <ul style="list-style-type: none"> <li>Impact on habitat for floral species.</li> <li>Impact on Floral Diversity</li> <li>Impact on Floral SCC</li> </ul> <p>During the construction phase, clearing vegetation will lead to the loss of natural vegetation.<br/> <b>Activities Triggered:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)<br/>           Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)</p>   |               |               |                 |                  |                      |                    |                    |                                   |
| Without Mitigation   | Negative      | 1             | 2               | 1                | 3                    | 3                  | 7                  | <b>21</b><br><b>Low- Moderate</b> |
| With Mitigation  | Negative      | 1             | 2               | 1                | 1                    | 3                  | 5                  | <b>15</b><br><b>Low</b>           |
| <p><b>Mitigation Measures</b></p> <ul style="list-style-type: none"> <li>During the design phase, aim to have connection routes coinciding with the existing tracks or fence lines to reduce the disturbance to vegetation and avoid creating new tracks and areas of compaction and maintenance machinery.</li> <li>After the final layout has been approved, conduct a thorough footprint investigation.</li> <li>The construction footprint must be surveyed and demarcated prior to construction commencing.</li> <li>A site plan must be developed showing the location of the site camp lay-down area and the plan must be approved by the ECO before construction begins.</li> <li>Where vegetation has been cleared outside of the construction footprint, site rehabilitation in terms of soil stabilization and revegetation must be undertaken.</li> <li>Should there be SCC identified, the SCC must be relocated to a nursery or native habitat.</li> </ul> |               |               |                 |                  |                      |                    |                    |                                   |
| <p><b>Cumulative Impact:</b></p> <ul style="list-style-type: none"> <li>The proposed 132kV powerline will be 4.5km long and will traverse across transformed ecosystems. The ecosystem has been transformed from its pristine state due to various historical and current anthropogenic activities happening around the area, which include power generation, road infrastructure development, farming and last but not least, construction of a network of power transmission and distribution lines spanning thousands of kilometres from the Lethabo power station. Of significance to note is that within the proposed corridors there</li> </ul>  |               |               |                 |                  |                      |                    |                    |                                   |

are existing power transmission lines that have been built over time and the observation has been that these lines apart from contributing to the nature of the transformed ecosystem due to clearance of vegetation at pylon station, there is no significant contribution to the degradation of the environment as compared to the other activities accruing around the area. It is in this regard that the anticipated cumulative impact from the proposed powerline on habitat for floral species, floral diversity, floral SCC and on fauna will be of insignificant nature.

- Cumulative impacts within the proposed corridor of the powerline and the surrounding areas have been determined to be low- moderate even though the ESA are deteriorating due to anthropogenic activities.

**Table 9-5: Fauna**

| <i>Phases</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i>               |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|-----------------------------------|
| Construction   |               |               |                 |                  |                      |                    |                    |                                   |
| <b>Impact on fauna due to loss of habitat</b><br>During the construction phase, clearing vegetation will lead to the loss of natural vegetation. |               |               |                 |                  |                      |                    |                    |                                   |
| Without Mitigation   | Negative      | 1             | 2               | 1                | 3                    | 3                  | 7                  | <b>21</b><br><b>Low- Moderate</b> |
| With Mitigation  | Negative      | 1             | 2               | 1                | 1                    | 3                  | 5                  | <b>15</b><br><b>Low</b>           |
| <b>Mitigation Measures</b><br>Clearance of vegetation must only be done in areas earmarked to avoid disturbance of the ecosystem.                |               |               |                 |                  |                      |                    |                    |                                   |

**Table 9-6: Avifauna**

| <i>Phases</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i>                |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|------------------------------------|
| Construction<br>Operation  |               |               |                 |                  |                      |                    |                    |                                    |
| <b>Impact:</b> Displacement of SCC and non-SCC priority species because of habitat loss & transformation<br><b>Activities Triggered:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)<br>Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv) |               |               |                 |                  |                      |                    |                    |                                    |
| Without Mitigation   | Negative      | 1             | 3               | 3                | 3                    | 4                  | 10                 | <b>40</b><br><b>Low - Moderate</b> |
| With Mitigation  | Negative      | 1             | 3               | 2                | 3                    | 3                  | 9                  | <b>36</b><br><b>Low - Moderate</b> |
| <b>Impact:</b> Displacement of SCC and non-SCC priority species as a result of disturbance<br><b>Activities Triggered:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)<br>Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)               |               |               |                 |                  |                      |                    |                    |                                    |
| Without Mitigation   | Negative      | 2             | 2               | 3                | 3                    | 4                  | 10                 | <b>40</b>                          |

|  |          |   |   |   |   |   |    |                                    |
|--|----------|---|---|---|---|---|----|------------------------------------|
|  |          |   |   |   |   |   |    | <b>Low - Moderate</b>              |
| With Mitigation  | Negative | 2 | 2 | 2 | 1 | 3 | 7  | <b>21</b><br><b>Low - Moderate</b> |
| <p><b>Impact:</b> Mortality of SCC and non-SCC priority species due to collision with the 132kV power line conductors/earth wires</p> <p><b>Triggered activities:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)<br/>Listing Notice 3, Government Notice R324 of 2017, 14 (ii)(b)(b)(i) (ff)</p>   |          |   |   |   |   |   |    |                                    |
| Without Mitigation   | Negative | 3 | 3 | 4 | 3 | 3 | 13 | <b>39</b><br><b>Moderate - Low</b> |
| With Mitigation  | Negative | 3 | 3 | 3 | 1 | 2 | 10 | <b>20</b><br><b>Low</b>            |
| <p><b>Mitigation Measures</b></p> <p><b>Displacement as a result of habitat loss:</b></p> <ul style="list-style-type: none"> <li>▪ Avoid removal of sensitive vegetation types. The recommendations of the biodiversity study <b>must be strictly implemented</b>, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.</li> <li>▪ Construction activity should be restricted to the immediate footprint of the infrastructure.</li> <li>▪ All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment.</li> <li>▪ All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.</li> <li>▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.</li> </ul> <p><b>Displacement as a result of disturbance:</b></p> <ul style="list-style-type: none"> <li>▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.</li> <li>▪ Measures to control noise should be applied according to current best practice in the industry.</li> </ul> <p><b>Mortality as a result of electrocutions on the 132kV power line infrastructure</b></p> <ul style="list-style-type: none"> <li>▪ If power line marking is required bird flight diverters must be installed on the full span length on each of the conductors (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated so as to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung.</li> <li>▪ The 132kV power line must be constructed using a bird friendly structure.</li> </ul> <p><b>Cumulative Impact:</b></p> <ul style="list-style-type: none"> <li>❑ The 132kV power line will increase the total number of existing and planned high voltage lines by a small percentage, therefore the contribution of the proposed 132kV power line to the cumulative impact of all the high voltage lines is deemed to be of <b>low</b> significance.</li> <li>❑ The combined cumulative impact of the existing power lines, i.e., the 132kV power line and all future proposed power lines on avifauna within a 30km radius is considered to be of <b>medium</b> significance.</li> </ul> |          |   |   |   |   |   |    |                                    |

| <ul style="list-style-type: none"> <li>❑ The cumulative impact of displacement due to disturbance and habitat transformation associated with the extensions within the RWB Substation is <b>low</b>, due to the small size of the footprint and the availability of similar habitat within the 30km radius area.</li> <li>❑ The cumulative impact of potential electrocutions within the RWB Substation is also likely to be <b>low</b> as it is expected to be a rare event.</li> </ul>   |               |               |                 |                  |                      |                    |                    |                      |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|----------------------|
| <i>Phase</i><br><i>Operation</i>   | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i>  |
| <b>Impact:</b> Mortality of SCC and non-SCC priority species as a result of electrocution on the 132kV power line infrastructure<br><b>Triggered activity:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)  |               |               |                 |                  |                      |                    |                    |                      |
| Without Mitigation   | Negative      | 3             | 3               | 4                | 3                    | 2                  | 13                 | 26<br>Moderate - Low |
| With Mitigation  | Negative      | 3             | 1               | 2                | 1                    | 1                  | 7                  | 7<br>Low             |
| <b>Impact:</b> Mortality of SCC and non-SCC priority species as a result of electrocution on the infrastructure within the RWB Substation  |               |               |                 |                  |                      |                    |                    |                      |
| Without Mitigation   | Negative      | 3             | 3               | 3                | 3                    | 2                  | 12                 | 26<br>Moderate - Low |
| With Mitigation  | Negative      | 2             | 2               | 2                | 1                    | 1                  | 7                  | 7<br>Low             |
| <b>Mitigation Measures</b> <ul style="list-style-type: none"> <li>▪ Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership.</li> <li>▪ Insulating material (if applied) to be maintained during the operational life span of the 132kV power line.</li> <li>▪ Bird flight diverters to be maintained on sections of power line during the operational life span of the 132kV power line.</li> <li>▪ Eskom substation managers are requested to report all bird electrocutions encountered during routine inspections of the RWB Substation to the Eskom-Endangered Wildlife Trust Strategic Partnership</li> </ul> |               |               |                 |                  |                      |                    |                    |                      |

**Table 9-7: Water Resources**

| <i>Phases</i><br><i>Construction</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i> |
|---|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|---------------------|
| <b>Impact on Wetland Features, Habitat and Ecological Structure</b> <ul style="list-style-type: none"> <li>▪ Site clearing and the removal of vegetation leading to increased runoff and erosion during rainfall events.</li> </ul> |               |               |                 |                  |                      |                    |                    |                     |



- Potential indiscriminate driving through wetland feature areas leading to soil compaction.
- Earthworks in the vicinity of the wetland feature system leading to loss of wetland feature habitat, erosion and altered runoff patterns.
- Spillage from construction vehicles and waste dumping leading to contamination of wetland feature soils.
- Changes to the wetland feature vegetation community due to alien invasion resulting in altered wetland feature conditions.

**Triggered Activities: Activities Triggered:** Listing Notice 1, Government Notice R327 of 107, 11(i)  
 Listing Notice 1, Government Notice R327 of 107, 19  
 Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)  
 Listing Notice 3, Government Notice R324 of 2017, 14 (ii)(b)(b)(i) (ff)

|                    |          |   |   |   |   |   |    |           |
|--------------------|----------|---|---|---|---|---|----|-----------|
| Without Mitigation | Negative | 2 | 2 | 3 | 3 | 2 | 10 | 20<br>Low |
| With Mitigation    | Negative | 2 | 2 | 2 | 3 | 2 | 9  | 18<br>Low |

**Impact on Wetland Hydrological Function and Sediment Balance**

- Potential poor planning, resulting in continuous shifting of the linear development within wetland habitat, leading to altered habitat. Site clearing and further removal of vegetation result in increased runoff, leading to erosion and alteration of the geomorphology of the wetland features.
- Disturbance of soils, topsoil stockpiling adjacent to the wetland features and runoff from stockpiles leading to sedimentation of the system.
- Earthworks near the wetland features lead to incision, erosion and altered runoff patterns.
- Movement of construction vehicles within the wetland features resulting in soil compaction.

**Triggered Activities: Activities Triggered:** Listing Notice 1, Government Notice R327 of 107, 11(i)  
 Listing Notice 1, Government Notice R327 of 107, 19  
 Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)  
 Listing Notice 3, Government Notice R324 of 2017, 14 (ii)(b)(b)(i) (ff)

|                    |          |   |   |   |   |   |    |           |
|--------------------|----------|---|---|---|---|---|----|-----------|
| Without Mitigation | Negative | 2 | 2 | 3 | 3 | 2 | 10 | 20<br>Low |
| With Mitigation    | Negative | 2 | 2 | 2 | 3 | 2 | 9  | 18<br>Low |

**Changes to Ecological and Socio-Cultural Services Provision**

- Potential poor planning, resulting in the placement of the linear development within wetland habitat, leading to altered habitat.
- Increased anthropogenic activity within the wetland feature leading to an increased impact on the biological structure of the wetland features and the associated effects that this will have on service provision.
- Loss of phosphate, nitrate, and toxicant removal abilities due to vegetation clearing
- Inability to support biodiversity due to vegetation clearing and contamination of wetland feature soils and water because of waste rubble dumping, increased sedimentation, and alteration of natural hydrological regimes.
- Earthworks within the wetland features leading to loss of flood attenuation abilities and streamflow regulation capabilities.

**Triggered Activities: Activities Triggered:** Listing Notice 1, Government Notice R327 of 107, 11(i)  
 Listing Notice 1, Government Notice R327 of 107, 19

| Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)<br>Listing Notice 3, Government Notice R324 of 2017, 14 (ii)(b)(b)(i) (ff)  |          |   |   |   |   |   |    |                |
|---|----------|---|---|---|---|---|----|----------------|
| Without Mitigation  | Negative | 2 | 2 | 3 | 3 | 2 | 10 | 20<br>Low      |
| With Mitigation   | Negative | 2 | 2 | 2 | 3 | 2 | 9  | 18<br>Low      |
| <p><b>Contamination and sedimentation of Vaal River</b></p> <ul style="list-style-type: none"> <li>Water pollution from powerline running adjacent to the line and Tributary.</li> <li>Wetland and flood plain pollution and erosion</li> <li>Sedimentation and siltation of the Vaal River Water course</li> </ul> <p><b>Triggered Activities: Activities Triggered:</b> Listing Notice 1, Government Notice R327 of 107, 11(i)<br/>Listing Notice 1, Government Notice R327 of 107, 19<br/>Listing Notice 3, Government Notice R324 of 2017, 12(b)(iv)<br/>Listing Notice 3, Government Notice R324 of 2017, 14 (ii)(b)(b)(i) (ff)</p>  |          |   |   |   |   |   |    |                |
| Without Mitigation  | Negative | 3 | 3 | 5 | 5 | 3 | 16 | 48<br>Moderate |
| With Mitigation   | Negative | 2 | 3 | 3 | 2 | 2 | 10 | 20<br>Low      |
| <p><b>Mitigation Measures</b></p> <p><u><b>Development footprint</b></u></p> <ul style="list-style-type: none"> <li>The development footprint area should remain as small as possible and should not encroach onto surrounding areas beyond the proposed/approved route.</li> <li>Ensure that only essential activities must occur within the wetland features which are traversed by the proposed powerline route, all other non-essential activities should occur outside of the freshwater features; the wetland areas not indicated within the linear development's footprint are off-limits to construction vehicles and personnel.</li> <li>Planning temporary roads and access routes should avoid natural areas and be restricted to existing gravel and tarred roads where possible.</li> <li>Appropriate sanitary facilities must be provided for the life of the construction and all waste removed to an appropriate waste facility.</li> <li>All hazardous chemicals should be stored in designated areas which are not located near freshwater feature areas.</li> <li>No fires should be permitted in or near the construction area.</li> <li>Restrict construction to the drier winter months, if possible, to avoid sedimentation of the wetland features and to minimise the severity of disturbance of the wetland habitat.</li> <li>Access to the construction site should be limited to a single-entry point to minimise compaction of soils, loss of vegetation and increased erosion; and</li> <li>Ensure that an adequate number of litter bins are provided and ensure the proper disposal of waste and spills.</li> </ul> <p><u><b>Vehicle access</b></u></p> <ul style="list-style-type: none"> <li>It must be ensured that all hazardous storage containers and storage areas comply with the relevant South African Bureau of Standards (SABS) standards to prevent leakage. All vehicles must be regularly inspected for</li> </ul> |          |   |   |   |   |   |    |                |

leaks. Re-fueling must take place on a sealed surface area to prevent the ingress of hydrocarbons into the topsoil.

- In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practised near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss; and
- All spills should they occur should be immediately cleaned up and treated accordingly.

**Soils**

- As much vegetation growth should be encouraged to protect soils.
- Dumped soils should be removed and the area must be levelled to improve the flow of water.
- Monitor all areas traversed by the development for erosion and incision, during site clearing in the preconstruction phase and throughout the construction phase.

**Rehabilitation**

- Bare areas that resulted from vegetation clearing during site preparation, must be revegetated with indigenous species to protect the soils.
- Construction rubble must be collected and dumped at a suitable landfill site; and
- All alien vegetation in the construction footprint areas as well as the immediate vicinity should be removed upon completion of construction. Alien vegetation control should take place for a minimum period of two growing seasons after construction is completed.

**Cumulative Impact:**

Cumulative impacts within the proposed corridor of the powerline and the surrounding areas have been determined to be moderate. Even though the health of the relevant wetland systems has been impaired over the last few decades regarding the operation of Lethabo Power Station, agricultural and mining activities, it should be noted that the proposed land use is expected to have fewer impacts than the current land use. The cumulative impacts are at an acceptable negative impact for which mitigation is desirable. The impact by itself is low even in combination with the current activities to prevent the development from being approved.

**Table 9-8: Archaeology and Paleontology Impact Assessment**

| <i>Phase</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i>  |
|---|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|----------------------|
| Construction  |               |               |                 |                  |                      |                    |                    |                      |
| <b>Impact:</b> Unearthing and destroying archaeological objects during the clearing of the servitude and excavation at tower positions. |               |               |                 |                  |                      |                    |                    |                      |
| Without Mitigation  | Negative      | 2             | 5               | 4                | 5                    | 2                  | 16                 | 32<br>Low - Moderate |
| With Mitigation   | Negative      | 1             | 5               | 1                | 1                    | 2                  | 8                  | 16<br>Low            |
| <b>Impact:</b> Damage/ destruction to fossil heritage resources during the excavations/ drilling at towers.                             |               |               |                 |                  |                      |                    |                    |                      |
| Without Mitigation  | Negative      | 1             | 5               | 1                | 3                    | 1                  | 10                 | 10<br>Low            |

|  |          |   |   |   |   |   |   |          |
|--|----------|---|---|---|---|---|---|----------|
| With Mitigation  | Negative | 1 | 5 | 1 | 1 | 1 | 8 | 8<br>Low |
| <b>Mitigation Measures</b>   |          |   |   |   |   |   |   |          |
| <u>Archaeology</u>   |          |   |   |   |   |   |   |          |
| <ul style="list-style-type: none"> <li>SAHRA should be immediately alerted if archaeological material is unearthed accidentally during construction. Construction activities should be stopped within a radius of at least 10m of the indicator/ finding and the area should then be demarcated by danger tape.</li> <li>A professional archaeologist or SAHRA officer should be contacted immediately. The Environmental officer and the contractor are responsible for protecting the site from publicity (i.e., media) until a mutual agreement is reached.</li> <li>It is mandatory to report any incident of human remains encountered to the South African Police Services.</li> <li>Field workers must be inducted about archaeology, and steps that should be taken in the case of exposing archaeological materials.</li> </ul> |          |   |   |   |   |   |   |          |
| <u>Palaeontology</u>   |          |   |   |   |   |   |   |          |
| <ul style="list-style-type: none"> <li>If fossils are found by the environmental officer, or other responsible person once excavations for pole foundations have commenced, then they should be rescued, and a paleontologist called to assess and collect a representative sample.</li> <li>The foundations should be monitored for any fossils once excavations have commenced.</li> <li>A Fossil Chance Find Protocol should be added to the EMP.</li> </ul>  |          |   |   |   |   |   |   |          |
| <b>Cumulative</b>  |          |   |   |   |   |   |   |          |
| No heritage and fossil traces were found on the site hence any impact in terms of archaeology and palaeontology is unlikely to add significantly to the cumulative impact of other developments in the area  |          |   |   |   |   |   |   |          |

**Table 9-9: Soil, Land Capability and Land Use**

| <i>Phase</i>   | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i> |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|---------------------|
| Construction   |               |               |                 |                  |                      |                    |                    |                     |
| <ul style="list-style-type: none"> <li>The clearing of topsoil and excavation may result in soil erosion and destruction of fertile topsoil.</li> <li>The movement of heavy machinery will result in soil compaction that will modify habitats, destroy vegetation and inhibit re-vegetation.</li> <li>Possible contamination of soil by cement.</li> <li>Loss of agricultural land</li> </ul> |               |               |                 |                  |                      |                    |                    |                     |
| Without Mitigation   | Negative      | 2             | 3               | 4                | 3                    | 3                  | 12                 | 36<br>Low to Medium |
| With Mitigation  | Negative      | 1             | 2               | 2                | 1                    | 2                  | 6                  | 12<br>Low           |
| <b>Mitigation Measures</b>   |               |               |                 |                  |                      |                    |                    |                     |
| <ul style="list-style-type: none"> <li>Due to the short duration of construction and the small footprint of the towers, it is anticipated that there will be minimal residual impacts on land use. A very small area of land will be disturbed during construction for structure installation, i.e., tower footprint.</li> </ul>   |               |               |                 |                  |                      |                    |                    |                     |

**Cumulative Impacts**

Since most current activities can be undertaken within the servitude, the cumulative impacts to land uses are therefore not anticipated to be considerable with the addition of the powerline. The construction of tower foundations would permanently remove small agricultural and grazing areas. These effects would compound as more electrical infrastructure is built, though the overall loss of agricultural land would be minimal relative to the size of the region.

**Table 9-10: Sense of Place**

| <i>Impact</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i> |
|--|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|---------------------|
| <b>Impact:</b> Visual impact and sense of place  |               |               |                 |                  |                      |                    |                    |                     |
| Without Mitigation   | Negative      | 3             | 3               | 3                | 3                    | 1                  | 12                 | 12<br>Low           |
| With Mitigation  | Negative      | 3             | 3               | 3                | 3                    | 1                  | 12                 | 12<br>Low           |
| <b>Cumulative Impacts</b>  |               |               |                 |                  |                      |                    |                    |                     |
| The proposed development will take place within a landscape that is already heavily impacted by large-scale industrial development including mining operations and the Lethabo Power Station. Therefore, the proportion of rural or riverine character in the area when compared with heavy industrial character will remain the same. Cumulative impacts of this new development to the larger area are likely to have low or no influence on the nature of the area due to existing heavy industrial and large mining areas located next to the project site. Existing industrial structures are likely to provide significant screening of the powerline. |               |               |                 |                  |                      |                    |                    |                     |

**Table 9-11: Social**

| <i>Phase</i>  | <i>Nature</i> | <i>Extent</i> | <i>Duration</i> | <i>Magnitude</i> | <i>Reversibility</i> | <i>Probability</i> | <i>Consequence</i> | <i>Significance</i> |
|---|---------------|---------------|-----------------|------------------|----------------------|--------------------|--------------------|---------------------|
| Construction  |               |               |                 |                  |                      |                    |                    |                     |
| <ul style="list-style-type: none"> <li>This project will result in local employment- and a boost to the local businesses, and there will thus be positive impacts to the communities. These will mostly be of low skill such as clearance of the servitude, stringing of cables and excavation of foundations.</li> </ul> |               |               |                 |                  |                      |                    |                    |                     |
| Without Mitigation  | Positive      | 3             | 2               | 3                | -                    | 3                  | 8                  | 24<br>Low-Moderate  |
| With Mitigation   | Positive      | 3             | 2               | 4                | -                    | 5                  | 9                  | 45<br>Moderate      |
| <ul style="list-style-type: none"> <li>It is predicted that the construction of the proposed project will lead to capacity building in the community, as this project may open opportunities for residents through training, coaching and skills transfer.</li> </ul>   |               |               |                 |                  |                      |                    |                    |                     |
| Without Mitigation  | Positive      | 3             | 2               | 3                | -                    | 3                  | 8                  | 24<br>Low-Moderate  |
| With Mitigation   | Positive      | 3             | 2               | 4                | -                    | 5                  | 9                  | 45<br>Moderate      |

|   |          |   |   |   |   |   |    |                    |
|---|----------|---|---|---|---|---|----|--------------------|
| <ul style="list-style-type: none"> <li>During the construction phase, there will likely be an increase in the number of people and labourers within the area which could increase crime, potential security risks, drug abuse, prostitution, Sexually Transmitted Diseases and decay of moral behaviour.</li> </ul>   |          |   |   |   |   |   |    |                    |
| Without Mitigation  | Negative | 3 | 3 | 4 | 3 | 3 | 13 | 39<br>Low-Moderate |
| With Mitigation   | Negative | 2 | 2 | 3 | 3 | 2 | 10 | 20<br>Low          |
| Loss of jobs and income after construction.   |          |   |   |   |   |   |    |                    |
| Without Mitigation  | Negative | 3 | 1 | 3 |   | 4 | 7  | 28<br>Low-Moderate |
| With Mitigation   | Negative | 3 | 1 | 3 |   | 2 | 7  | 14<br>Low          |
| <b>Mitigation Measures</b> <ul style="list-style-type: none"> <li>Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used.</li> <li>Local subcontractors and labourers should be considered for possible employment.</li> <li>All employees must be trained in the function of their job and that such training should also incorporate health, safety, security and environmental aspects.</li> <li>The tender document should specify the use of local labourers or enterprises (where possible). Where possible, on-site training should be undertaken to ensure long-term benefits to the members of the community.</li> <li>The contractor must develop a code of conduct for employees.</li> <li>The contractor must establish and rigorously enforce rules and disciplinary procedures.</li> <li>The developer and contractor must vet potential workers for criminal records.</li> </ul> |          |   |   |   |   |   |    |                    |
| <b>Cumulative Impact:</b><br>Construction and operation of the proposed power line and Solar Plant would be a beneficial cumulative impact on surrounding areas, including the availability of electricity and the revenue generated during the construction activities. The significance is expected to be medium to high with revenue being generated for a short timeframe whilst additional electricity will be added to the grid for a long time.  |          |   |   |   |   |   |    |                    |

### 9.2.4 Impact Summary

The table below shows the summary of the impacts assessed and the impacts that were deemed to be of low significance such as noise and air with mitigation measures.

**Table 9-12: Impact Summary and Significance Ratings**

| AFFECTED ENVIRONMENT | ACTIVITY  | IMPACT DESCRIPTION  | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE POST-MITIGATION | PROPOSED MITIGATION MEASURES  |
|----------------------|---|---|--------------------------------|------------------------------|---|
| Flora                | Vegetation clearance                            | Impact on habitat for floral species.   | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>▪ A site plan must be developed showing location of the site camp lay-down area and the plan must be approved by the ECO before construction begins.</li> <li>▪ Where vegetation has been cleared outside of the construction footprint, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken.</li> <li>▪ Should there be SCC identified, the SCC must be relocated to a nursery or native habitat.</li> </ul> |
| Flora                |   | Impact on Floral Diversity  | L-M<br>(-)                     | L<br>(-)                     |   |
| Flora                |   | Impact on Floral SCC  | L-M<br>(-)                     | L<br>(-)                     |   |
| Fauna                | Vegetation clearance                            | Impact on fauna due to loss of habitat  | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>▪ Clearance of vegetation must only be done on areas earmarked to avoid disturbance of the ecosystem.</li> </ul>   |
| Avifauna             | Vegetation clearance and operation of powerline | Displacement of SCC and non-SCC priority species because of habitat loss & transformation | L-M<br>(-)                     | L-M<br>(-)                   | <ul style="list-style-type: none"> <li>▪ Avoid removal of sensitive vegetation types. The recommendations of the biodiversity study must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.</li> <li>▪ Construction activity should be restricted to the immediate footprint of the infrastructure.</li> </ul>  |

| AFFECTED ENVIRONMENT | ACTIVITY                   | IMPACT DESCRIPTION   | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE POST-MITIGATION | PROPOSED MITIGATION MEASURES   |
|----------------------|----------------------------|--|--------------------------------|------------------------------|--|
| Avifauna             | Construction activities    | Displacement of SCC and non-SCC priority species because of disturbance  | L-M<br>(-)                     | L-M<br>(-)                   | <ul style="list-style-type: none"> <li>All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.</li> <li>Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.</li> <li>Displacement because of disturbance:</li> <li>Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.</li> </ul>                              |
| Avifauna             | Planning/ line designing   | Mortality of SCC and non-SCC priority species due to collision with the 132kV power line conductors/earth wires        | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>If power line marking is required bird flight diverters must be installed on the full span length on each of the conductors (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as the conductors are strung.</li> <li>The 132kV power line must be constructed using a bird friendly structure.</li> </ul> |
| Avifauna             | Operation of powerline and | Mortality of SCC and non-SCC priority species because of electrocution on the 132kV power line infrastructure          | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership.</li> <li>Insulating material (if applied) to be maintained during the operational life span of the 132kV power line.</li> <li>Mortality because of collision with the overhead conductors and/or earthwires of the 132kV power line</li> </ul>  |
| Avifauna             | substation                 | Mortality of SCC and non-SCC priority species because of electrocution on the infrastructure within the RWB Substation | L-M<br>(-)                     | L<br>(-)                     |  |



| AFFECTED ENVIRONMENT | ACTIVITY                            | IMPACT DESCRIPTION   | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE POST-MITIGATION | PROPOSED MITIGATION MEASURES  |
|----------------------|-------------------------------------|--|--------------------------------|------------------------------|---|
|                      |                                     |  |                                |                              |   |
| Wetlands             | Vegetation clearance and earthworks | Impact on Wetland Features, Habitat and Ecological Structure | L<br>(-)                       | L<br>(-)                     | <ul style="list-style-type: none"> <li>• During construction use techniques which support the hydrology and sediment control functions of the freshwater features,</li> <li>• Limit excavations to a limited extent to ensure that drainage patterns within the features return to pre-development status.</li> </ul>               |
| Wetlands             |                                     | Impact on Wetland Hydrological Function and Sediment Balance | L<br>(-)                       | L<br>(-)                     | <ul style="list-style-type: none"> <li>• Do not allow surface water or stormwater to be concentrated, or to flow down slopes without erosion protection measures being in place.</li> <li>• The entire construction area must not be stripped of vegetation prior to commencing construction activities.</li> </ul>                 |
| Wetlands             |                                     | Changes to Ecological and Socio-Cultural Services Provision  | L<br>(-)                       | L<br>(-)                     | <ul style="list-style-type: none"> <li>▪ During construction use techniques which support the hydrology and sediment control functions of the freshwater features.</li> <li>▪ Limit excavations to a limited extent to ensure that drainage patterns within the features return to pre-development status.</li> </ul>               |
| River                | Clearing at tower sites             | Contamination and sedimentation of Vaal River                | M<br>(-)                       | L<br>(-)                     | <ul style="list-style-type: none"> <li>▪ Ensure erosion control measures are in place and collect eroded water for settling from the construction sites.</li> <li>▪ Prevent water from flowing through the areas under construction by temporary diversion as well as undertaking the work in the dry season if possible</li> </ul> |

| AFFECTED ENVIRONMENT | ACTIVITY                                  | IMPACT DESCRIPTION  | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE POST-MITIGATION | PROPOSED MITIGATION MEASURES   |
|----------------------|---|---|--------------------------------|------------------------------|--|
| Archaeology          | Excavations                               | Unearthing and destroying archaeological objects during the clearing of the servitude and excavation at tower positions.        | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>Field workers must be inducted about archaeology, and steps that should be taken in the case of exposing archaeological materials.</li> </ul>   |
| Paleontology         | Excavations                               | Damage/ destruction to fossil heritage resources during the excavations/ drilling at towers.                                    | L<br>(-)                       | L<br>(-)                     | <ul style="list-style-type: none"> <li>The foundations should be monitored for any fossils once excavations have commenced.</li> <li>A Fossil Chance Find Protocol should be added to the EMP.</li> </ul>  |
| Social               | Procurement of material and labor         | Local employment- and a boost to the local businesses   | L-M<br>(+)                     | M<br>(+)                     | <ul style="list-style-type: none"> <li>Local subcontractors and labourers should be considered for possible employment.</li> </ul>   |
| Social               | Construction of line.                     | Capacity Building   | L-M<br>(+)                     | M<br>(+)                     | <ul style="list-style-type: none"> <li>Training should be done on skills that can be readily transferred to other employment opportunities in the local area.</li> </ul>   |
| Social               | The hiring of employees from other areas. | Increase crime, potential security risks, drug abuse, prostitution, Sexually Transmitted Diseases and decay of moral behaviour. | L-M<br>(-)                     | L<br>(-)                     | <ul style="list-style-type: none"> <li>The contractor must develop a code of conduct for Employees.</li> <li>The contractor must establish and rigorously enforce rules and disciplinary procedures.</li> <li>The developer and contractor must vet potential workers for criminal records.</li> </ul> |

## 10 OVERVIEW OF SPECIALISTS' ASSESSMENT

The identification and commissioning of the specialist studies was based on the preliminary site inspection undertaken by DIGES and the Proponent (Eskom), to verify the environmental theme sensitivities as indicated in the Screening Report. The site sensitivity verification was undertaken as per the Gazetted General Requirement Assessment Protocols. The table below indicates the environmental theme sensitivities and the recommended Specialist assessments as per the Screening Report generated from the DFFE tool. Reference is also made to the Screening Report attached in Appendix B.

**Table 10-1: Environmental Sensitivities**

| THEME                    | SENSITIVITIES | SPECIALIST STUDY RECOMMENDED |
|--------------------------|---------------|------------------------------|
| Agriculture              | High          | Yes                          |
| Animal Species           | High          | Yes                          |
| Aquatic Biodiversity     | Low           | Yes                          |
| Archaeology & Heritage   | Low           | Yes                          |
| Civil Aviation           | Low           | Yes                          |
| Defence                  | Low           | No                           |
| Palaeontology            | Very high     | Yes                          |
| Plant Species            | Low           | Yes                          |
| Terrestrial Biodiversity | Very High     | Yes                          |

Based on the environment observed and the nature of the development, several specialist studies were commissioned to gain an in-depth understanding of the status quo of various aspects of the environment and how the development will have an impact on these environmental aspects. The basis of commissioning some of these specialist studies is indicated in the Site Sensitivity Verification Report attached to Appendix E-1.

The Specialist studies that have been undertaken have been based on the Gazetted Protocols published in Government Notice No. 320 of 20 March 2020. Where no protocol exists for a specific theme, the assessment and reporting of impacts on that feature or proposed area of development was done in

accordance with Appendix 6 of the NEMA EIA Regulations Government Notice R326 of 2017. The studies undertaken have generally followed the same approach:

- ❑ Collection and collation of existing baseline information of the study area in addition to any supplementary survey work required to fill any data gaps.
- ❑ Regular consultation with specialists within the team.
- ❑ Consideration of the potential impacts of the proposed powerline on the existing baseline, followed by identification of possible route changes that would lead to the avoidance or reduction of predicted adverse effects.
- ❑ An evaluation of the significance of any residual and cumulative impacts.
- ❑ Recommendation of mitigation measures to minimize the anticipated impacts.

Summaries of the avifauna, archaeology, hydrology, paleontology, terrestrial biodiversity, and wetland assessments are given in the sections below whilst the detailed reports are attached in Appendices E-2 to E-7.

## **10.1 AVI-FAUNA IMPACT ASSESSMENT**

The Avi-fauna Impact study was carried out by Feathers Environmental Services and the summaries indicated below are excerpts from the Avifauna Report that is attached in **APPENDIX E-2**.

The assessment was undertaken based on the minimum report requirements listed in the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (Government Gazette No 43855, 30 October 2020). The abridged Terms of Reference are given below:

- ✓ Conduct a site sensitivity verification using a desk top analysis, using satellite imagery and other available and relevant information, in addition to an on-site field inspection.
- ✓ Assess various avifaunal datasets.
- ✓ Identify and confirm avifaunal micro-habitats within the along the 132kV power line alignment.
- ✓ Describe the avifaunal communities (both SCC and non-SCC priority species) most likely to be impacted.
- ✓ Provide a detailed description of the impacts associated with the construction and operation of the 132kV power line and infrastructure within the RWB Substation.
- ✓ Assess the significance of the identified direct, indirect, and cumulative impacts, during the construction and operation phases of the 132kV power line and the infrastructure within the RWB Substation.
- ✓ Consider the two route alignments and advise possible changes to the alternatives.

- ✓ Recommend practical mitigation measures for the management of the identified impacts, at each stage of the development process.
- ✓ Propose a monitoring programme for the sensitive areas, species or receptors.
- ✓ Describe the gaps in baseline data and an indication of the confidence levels.

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### 10.1.1 Assumptions and Limitations

The following assumptions and limitations were made:

- The report is the result of a short-term study and is based on a one-day field survey of the PAOI. No long-term, seasonal monitoring was conducted by the avifaunal specialist. This assessment relies upon secondary data sources with regards to bird occurrence and abundance such as the SABAP2 and IBA projects. These comprehensive datasets provide a valuable baseline against which any changes in species presence, abundance, and distribution can be monitored. However, primary information on bird habitat and avifaunal species occurrence collected during the site visit and together with professional judgement, based on extensive field experience since 2006, was used directly in determining which species of conservation importance are likely to occur within suitable avifaunal habitat types within the PAOI. Based on these findings, the specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation.
- The focus of this assessment is primarily on the potential impacts on regional SCC and non-SCC power line sensitive species.
- Predictions in this study are based on experience of these and similar species in different parts of South Africa, through the authors' experience working in the avifaunal specialist field since 2006. However, bird behaviour can't be reduced to formulas that will hold true under all circumstances. It must also be noted that, it is often not possible to eliminate the risk of the disturbance and displacement impacts associated with the construction and operational activities. Our best possible efforts can probably not ensure zero impact on birds. Assessments such as this attempt to minimize the risk as far as possible, and although the displacement impacts, associated with the construction and operation of the 132kV power line, will be unavoidable, they are likely to be temporary and of moderate to low significance.

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### 10.1.2 Methodology

The focus of the assessment is primarily on the potential impacts of the development on priority species which include both Species of Conservation Concern (SCC) as defined by the Species Environmental Assessment Guideline: Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa (2020). In addition, the Project

Area of Influence (PAOI) is defined as a 2km zone around the proposed development area. Avifaunal sensitivity has been defined for this PAOI. The following methods were employed to compile the avifaunal impact assessment report:

- ❑ A total of 129 full protocol lists and 98 ad hoc protocol lists have been completed, which provides an accurate snapshot of the avifauna in the study area.
- ❑ Collection and examination of various avifaunal data sets at a desktop level to determine the presence of species.
- ❑ Identification of suitable avifaunal habitats and potential sensitive areas using various Geographic Information System (GIS) layers and Google Earth imagery.
- ❑ Undertaking one-day field survey.
- ❑ Utilization of quantitative criteria to predict and assessment of their significance.
- ❑ Recommendation of practical management and mitigation of impacts

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### 10.1.3 Description of Expected Impacts

- ❑ The habitat within which the Project Area of Influence (PAOI) is located is considered to have a **moderate to low** sensitivity. In recent years, anthropogenic impacts, mostly in the form of industrial, urban, and peri-urban transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI.
- ❑ The construction of the 132kV power line and bay and busbar extensions within the RWB Substation will result in impacts of **moderate-low** significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. It is anticipated that the 132kV power line and bay and busbar extensions can be constructed with acceptable levels of impact on the resident avifauna.
- ❑ The 132kV power line will increase the total number of existing and planned high voltage lines by a small percentage, therefore the contribution of the proposed 132kV power line to the cumulative impact of all the high voltage lines is deemed to be of **low** significance.
- ❑ The combined cumulative impact of the existing power lines, i.e. the 132kV power line and all future proposed power lines on avifauna within a 30km radius is of **medium** significance.
- ❑ The cumulative impact of displacement due to disturbance and habitat transformation associated with the extensions within the RWB Substation is **low**, due to the small size of the footprint, and the availability of similar habitat within the 30km radius area.
- ❑ The cumulative impact of potential electrocutions within the RWB Substation is also likely to be **low** as it is expected to be a rare event.

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#### 10.1.4 Conclusions and Recommendations

A screening report for the proposed grid connection indicated that a small portion of the broader Project Area Of Influence (PAOI) is considered to have a **high** Animal Species sensitivity, based on the possible occurrence of African Grass Owl *Tyto capensis*, African Marsh Harrier *Circus ranivorus*, Caspian Tern *Hydroprogne caspia* and Yellow-billed Stork *Mycteria ibis* and a **medium** Animal Species sensitivity based on the possible occurrence of three of the aforementioned species. Verification was conducted using a desktop analysis and a field survey, the results of which determine the sensitivity to be **medium to low** within the proposed development corridor. It is anticipated that the 132kV power line and bay and busbar extensions can be constructed with acceptable levels of impact on the resident avifauna, subject to the following recommendations:

- ❑ The 132kV power line must be constructed using a bird friendly structure.
- ❑ The recommendations of the biodiversity specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- ❑ Construction activities (i.e. all staff, vehicle and machinery) should be restricted to the immediate footprint of the infrastructure.
- ❑ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species.
- ❑ Maximum use should be made of existing roads and the construction of new roads must be kept to a minimum.
- ❑ If collision or electrocution impacts are recorded once the 132kV power line are operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.
- ❑ If electrocution impacts are recorded within the operational RWB Substation, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigates the mortalities and provides recommendations for site-specific mitigation to be applied reactively.
- ❑ In addition to this, the normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible.

#### 10.2 ARCHAEOLOGICAL IMPACT ASSESSMENT

The Archaeological Impact Study was carried out by Vhubvo Archaeo-Heritage Consultants and the summaries indicated below are excerpts from the Archaeology Report is attached in **Appendix E-3**.

The Terms of Reference for the study were:

- ✓ Conduct a desktop review and situation assessment based on existing information for the study scope, site, and area.
- ✓ Identify and map the freshwater ecosystems (rivers and wetlands) within the proposed mining area that could be affected by the proposed mining activities.
- ✓ Assess the ecological condition and importance of potentially impacted freshwater ecosystems;
- ✓ Assess the significance of the identified potential impacts on freshwater ecosystems that could result from the proposed activities.
- ✓ Provide recommendations to mitigate the potentially negative impacts on freshwater ecosystems that could result from the proposed activities.
- ✓ Identify the legal requirements in terms of the National Water Act (Act No. 36 of 1998) that could be triggered by the proposed activities.
- ✓ Provide a summary of the findings in a Freshwater Ecosystems Impact Assessment Report.

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### 10.2.1 Assumptions and Limitations

The following assumptions were made:

- Some of the portions of the proposed alternatives are encroached by grass which makes it difficult to survey and or observe the surface, however, the survey was deemed successful, and the area was thoroughly investigated.

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### 10.2.2 Methodology

The following methodology was used, and it was based on SAHRA Policy Guidelines for impact assessment, 2012.

- i. Literature review,
- ii. Consultations with the developer and appointed consultants,
- iii. Completion of a field survey; and
- iv. Analysis of the acquired data, leading to the production of this report.

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### 10.2.3 Summary of Assessment

- Two corridors are proposed. Corridor alternative one transverse adjacent to an existing powerline(s) and is close to the road. As a result, there are no major heritage materials expected



here. The second alternative deviates from the first and runs close to the first alternative meaning the area of the second alternative is equally disturbed.

- Archaeological sites dating to the Stone, Iron, and Historical Age are known to occur in the region of the study area, however, none of those were documented during the survey.
- There was no subsurface inspection, as a result, it might be possible that specific aspects related to construction might have a direct disturbance on subsurface heritage resources, which in turn may result in irreplaceable loss of heritage resources.

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#### 10.2.4 Conclusions and Recommendations

The Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed construction of the Powerline did not yield any heritage resources within the footprint of both corridors. Though both corridors are viable, corridor Alternative One is the preferred alternative from a heritage impact perspective due to its proximity to the road and existing line. The following recommendations should be included in the EMPr and implemented by a qualified ECO:

- SAHRA should be alerted immediately should any archaeological material be unearthed accidentally during construction. Construction activities should be stopped within a radius of at least 10m of the indicator/ finding and the area should then be demarcated by a danger tape.
- A professional archaeologist or SAHRA officer should be contacted immediately. It is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- It is mandatory to report any incident of human remains encountered to the South African Police Services.
- Field workers must be inducted about archaeology, and steps that should be taken in the case of exposing archaeological materials.

### 10.3 HYDROLOGY

The Hydrological study and a 1:100-year floodline determination of the proposed 132KV powerline was carried out by Zara Capital Consultants and the summaries indicated below are excerpts from the Hydrology Report is attached in **Appendix E-4**.

The Terms of Reference were as follows:

- ✓ Undertake a detailed desktop assessment which includes, a review of all existing hydrology information for the project area including, mean annual runoff (MAR), mean annual precipitation (MAP), mean annual evaporation (MAE), catchment characteristics.

- ✓ Determine flood line by modelling a succession of design storms at specific durations and produce peak flows and determine flood lines indicating the areas that will be inundated during a 100-year flood event in the study area.
- ✓ Determine flood risk and flood hazard throughout the study site.
- ✓ Recommend mitigation measures associated with the results of the hydraulic analysis.

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### 10.3.1 Methodology

The hydrological assessment was conducted by the means of the following:

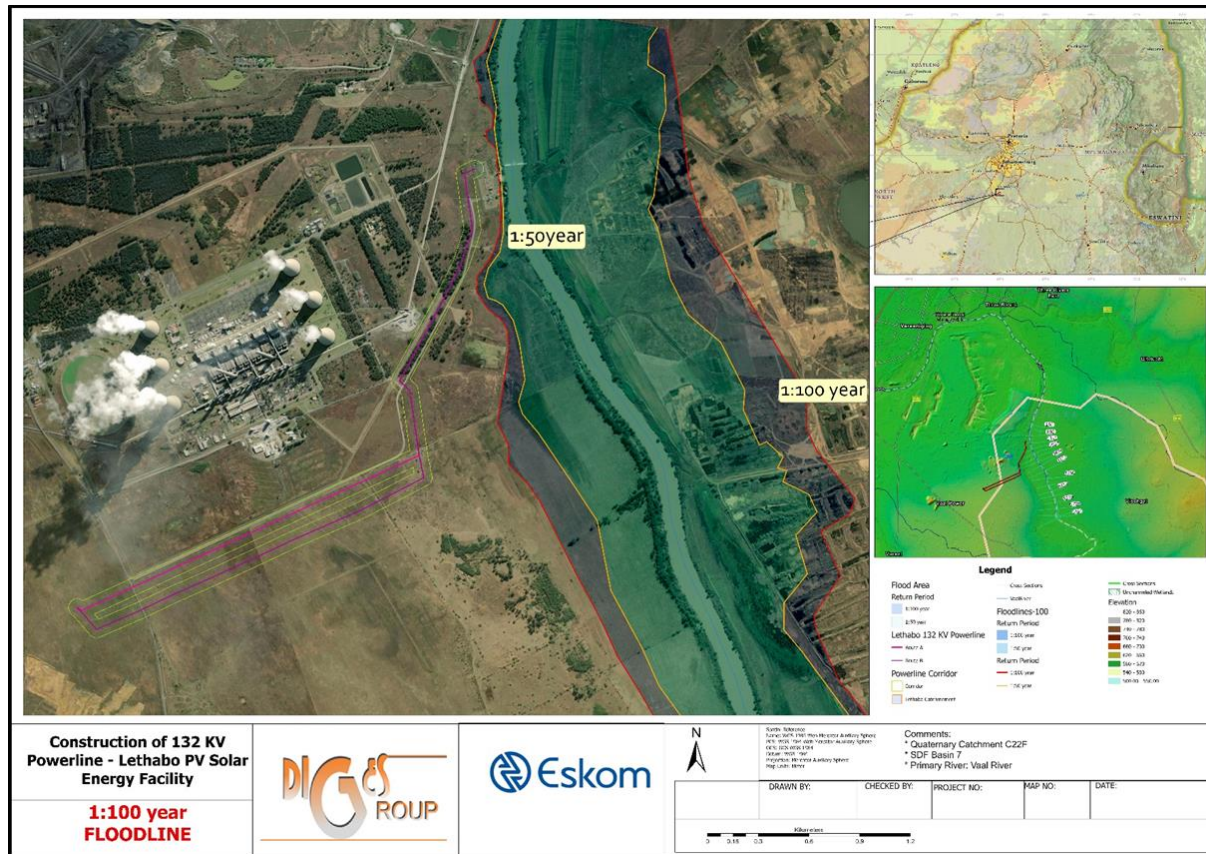
- Various methods, including the Alternative Rational method (ARM), Standard Design Flood (SDF), and Regional Method Flood, have been utilized to estimate peak flows, with returns of over  $100 \text{ m}^3/\text{s}$  for a 1:2-year event.
- Review of both regional and local hydrological information, anecdotal evidence from historical flood events, and flow estimations utilizing regional methodologies for flood hydrology in ungauged catchments.

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### 10.3.2 Impact Assessment

*'Excerpt from the Hydrological Assessment'*

- The flood lines extent coarsely determine from the 1-meter contours will overtop the floodplains and some of the cultivated land around the proposed sites. This results in a wider floodline towards the northern banks of the site tributary.
- The Floodline map overleaf shows that the powerline alternatives are outside the 1: 50 and 1:100-year flood line.
- There are moderate pressures on the water resources of the site catchment from the utilization of groundwater and surface water systems. The catchment wetland system suffers from erosion and sedimentation, undesirable plant species and aquatic fauna infestations.
- Artificial drainages have become prominent due to exacerbated power leakages into the channels. Judicious planning and management are required to ensure equitable allocation of the available water resources and that the water resource is not depleted nor polluted. In addition, it is necessary to plug artificial drainage channels created by development or historical mining practices to drain wetland areas from other land uses such as heavy industries and residential areas.
- Water quality remains at risk of impacts in the catchment of the proposed construction. In terms of potential surface water quality, water overflow could prove catastrophic as the area is part of a greater wetland system



### 10.3.3 Conclusion and Recommendations

Although the project poses potential environmental risks, it is unlikely to result in significant impacts on the receiving watercourse. It is recommended that any future additional infrastructure should be located outside the modelled 1:100-year floodlines from the edge of the Vaal River. From a hydrological assessment, both corridors are viable as they do not fall within the 1:50-year and 1:100-year floodlines. The following recommendations should also be implemented to minimise erosion and sedimentation:

- Runoff from dirty areas should not be allowed to flow into the stream, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained.
- Prevent water from flowing through the areas under construction by temporary diversion as well as undertaking the work in the dry season if possible.
- Use non-toxic materials: Use non-toxic materials for construction, such as non-toxic lubricants and hydraulic fluids, to reduce the impact on the environment.
- Remove alien invasive plants, along the floodplains (catchment 1), to encourage channelled drainage.

- Minimize the clearing of vegetation: Clear only the minimum amount of vegetation required for the construction of the powerline. This will help to minimize the impact on the ecosystem and reduce soil erosion and sedimentation into the river.
- Construction of the proposed powerline is carried out during dry periods where there is no storm flow, alternatively done in phases to allow temporary diversion of flow during construction.
- Ensure that even small drainage channels are identified and incorporated to design sufficient capacity.
- Ongoing surface water monitoring is imperative during all phases of the project life and post closure to allow for early detection of potential contaminants that may cause unforeseen negative impacts on the receiving environment.

## 10.4 PALAEOLOGY IMPACT ASSESSMENT

A desktop study was undertaken by Prof Marion Bamford and the report is attached in **Appendix E-5**.

The Terms of Reference were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.

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### 10.4.1 Assumptions and Limitations

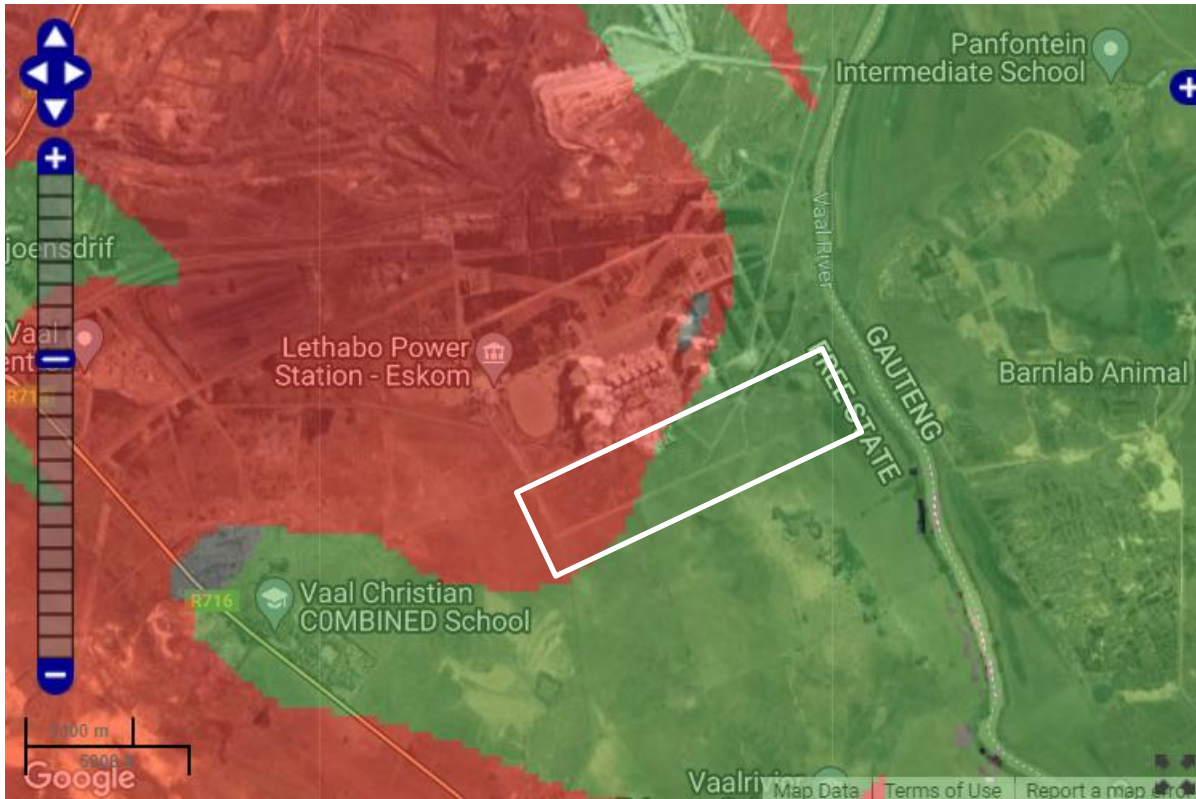
It is assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some might contain fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils. It is unlikely that fossils occur on the surface and it unknown if there are any fossils below the found surface. The latter can only be determined when excavations commence.

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### 10.4.2 Summary of Assessment and Recommendations

*'Excerpt from the Palaeontology Report'*

- The palaeontological sensitivity of the area under consideration is presented in the Figure above.
- The western part (both routes and corridors) is in the Vryheid Formation that might preserve fossils plants of the *Glossopteris* flora (Plumstead, 1969; Anderson and Anderson, 1985).
- The eastern part is on moderately sensitive sands and alluvium of Quaternary age that might have transported fragmentary fossils such as bones and silicified wood.



- The geological structures suggest that the rocks are the right age and type to contain fossils but there are no rocky outcrops visible. Since there is a small chance that there may be fossils below ground in the Vryheid Formation, and may be disturbed, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is low.

#### 10.4.3 Recommendations

- If fossils are found by the environmental officer, or other responsible person once excavations for pole foundations have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample.
- The impact on the palaeontological heritage would be low, so as far as the palaeontology is concerned, the foundations should be monitored for any fossils once excavations have commenced.
- A Fossil Chance Find Protocol should be added to the EMPr.

### 10.5 TERRESTRIAL BIODIVERSITY

The Terrestrial Biodiversity Assessment was carried out by Enviroshiq Consulting and the report is attached as **APPENDIX E-6**.

The Terms of Reference were as follows:

- ✓ To conduct a floral and fauna survey of the study site.
- ✓ To survey the occurrence or potential occurrence of conservation important plant species (Species of Conservation Concern (SCC) on the proposed study site.
- ✓ To assess the relative vegetation sensitivity (conservation importance and ecological function) of the study site and incorporate the findings into a sensitivity map.
- ✓ Indicate the likely impacts of the proposed powerline on the natural environment and on and adjacent to the site.)
- ✓ To identify and consider all sensitive landscapes including rocky ridges, wetlands, and any other ecologically important features, if present.

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### 10.5.1 Assumptions and Limitations

The following assumptions and limitations apply to the assessment:

- The biodiversity assessment was confined to the study area and did not include the neighbouring and adjacent properties. These were considered as part of the desktop assessment.
- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most floral and faunal communities were accurately assessed and considered, with all relevant online sources and background information utilised to improve on the overall understanding of the study area's ecology.
- Due to the nature and habits of most faunal taxa, it is unlikely that all species would have been observed during a field assessment of limited duration. Due to the locality of the study area within a power station vicinity where continuous anthropogenic activities occur, the cyclical nature of many species' life stages, as well as the season of the assessment, resulted in very few faunal species being observed. As such, background data (desktop) and literature studies (previous studies undertaken in the immediate area) were used to further infer faunal species composition and sensitivities in relation to the available habitat.
- Sampling, by its nature, means that not all individuals are assessed and identified. Some species and taxa associated with the study area may have been missed during the assessment; and
- The data presented in this report are based on one site visit, undertaken on the 24th of February 2023. A more accurate assessment would require that assessments take place in all seasons of the year. However, on-site data was augmented with all available desktop data. Together with project experience in the area, the findings of this assessment are an accurate reflection of the ecological characteristics of the study area.

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## 10.5.2 Methodology

- Literature review: It entailed the review of the relevant maps, aerial photographs and other information on the natural environment of the concerned area, the desktop assessment also included a review of the Ecological Assessment Report for the proposed Lethabo Solar Energy facility to be build next to the Lethabo power station where the proposed powerline will be connecting to.
- Site visit: A one-day field assessment was undertaken on 24 February 2023, to determine the ecological status of the study area. A reconnaissance 'walkabout' was initially undertaken to determine the general habitat types found throughout the study area and, following this, specific study sites were selected that were representative of the habitats found within the area, with special emphasis being placed on areas that may potentially support Red Data Listed (RDL) species and/ or other floral Species of Conservation Concern (SCC). Sites were investigated on foot to identify the occurrence of the dominant plant species and habitat diversities.
- Vegetation surveys were undertaken by first identifying different habitat units and then analysing the floral species composition that was recorded during detailed floral assessments using the step point vegetation assessment methodology. Floral species were recorded and a species list was compiled for each habitat unit.

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## 10.5.3 Impact Assessment

### *Excerpt from the Terrestrial Biodiversity Assessment*

- The proposed site is situated within Central Free State grassland, which is not considered to be vulnerable however, the Free State Biodiversity Conservation Assessment classifies the study area as Ecological Support Areas 1 and 2.
- The findings of the field assessment indicate that the vegetation within the two alternative corridors is transformed, with low plant species richness and no red data plant species present.
- The terrestrial habitat associated with the study area is of low to intermediate sensitivity. Widespread anthropogenic impacts from current use and some levels of alien and invasive plant proliferation have degraded the available floral habitat associated with the site.
- No threatened plant species were confirmed during fieldwork and no Near Threatened and protected species were recorded.
- There were no species of conservational concern (SCC) observed all the assessed corridors.
- In total, 23 plant species were recorded from the proposed corridors. No threatened fauna species were recorded.

- Large areas of secondary grassland are also present because of edge effects associated with these activities, such as woody encroachment and alteration of fire frequency and intensity. Thus, three habitat units are present in the study area or close to the boundary of the study site, namely the Transformed / Degraded Habitat Unit, the Secondary grassland Habitat Unit and the Wetland Habitat Unit.
- During the site assessment, small burrows of Yellow Mongoose (*Cynictis penicillata*) were observed in section B of the site. Hares (*Lepus saxatilis* and *L. capensis*) which is a terrestrial vertebrate was on the site.
- The major impacts on fauna are likely to occur during the construction phase due to the increased human presence at the sites as well as the operation of heavy machinery. This will however be temporary, no RDB species are likely to be impacted, and in the longer-term impact on fauna would be low. With mitigation and regulation of human activity at this site, these impacts can likely be reduced to an acceptable level as is the case currently.
- A moderate to high diversity of alien species occurs within the study area, especially within the transformed areas.
- A low diversity of medicinal plant species is present, and all the species are widespread thus the proposed construction is not likely to pose a significant threat to medicinal species locally and regionally.
- Priority areas include formal and informal protected areas (nature reserves); important bird areas (IBAs); RAMSAR sites; National freshwater ecosystem priority areas (NFEPA) and National protected areas expansion strategy (NPAES) areas. The study area is not situated within, or adjacent to, any priority areas.

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#### 10.5.4 Conclusion and Recommendations

Both corridors are viable as there are no significant impacts associated with the development of any of the proposed corridors that cannot be reduced to a manageable level through mitigation. There are therefore no reasons from a terrestrial ecology perspective that the development should not proceed provided the following recommendations are implemented:

- All infrastructure is to be situated within the boundaries of the assessed corridors.
- Prior to any construction at any of the sites, an experienced botanist should conduct a walk-through of the corridor during the wet season (Dec-Apr), marking each plant species of conservation concern to be avoided or that may need to be relocated prior to any site clearance activity taking place.
- During the design phase, aim to have connection routes coinciding with the existing tracks or fence lines to reduce the disturbance to vegetation and avoid creating new tracks and areas of compaction and maintenance machinery.



- After the final layout has been approved, conduct a thorough footprint investigation.
- The construction footprint must be surveyed and demarcated prior to construction commencing.
- A site plan must be developed showing location of the site camp lay-down area and the plan must be approved by the ECO before construction begins.
- Where vegetation has been cleared outside of the construction footprint, site rehabilitation in terms of soil stabilisation and revegetation must be undertaken.
- Should there be SCC identified, the SCC must be relocated to a nursery or native habitat.
- Clearance of vegetation must only be done on areas earmarked to avoid disturbance of the ecosystem.

## 10.6 WETLAND DELINEATION

The Wetland Delineation was carried out by Enviroshiq Consulting and the report is attached as **APPENDIX E-7**.

The Terms of Reference were as follows:

- ✓ Identify and delineate any wetland areas and/or watercourses within a 500m boundary around the proposed development site according to the Department of Water Affairs “Practical field procedure for the identification and delineation of wetlands and riparian areas”.
- ✓ Determine the Present Ecological Status (PES) and Functional Integrity of identified wetlands using the WET-Health and Wet-EcoServices approach.
- ✓ Determine the Ecological Importance and Sensitivity (EIS) of identified wetlands using the latest applicable approach supported by the DWS.
- ✓ Identify possible impacts to wetlands or watercourses within the study area as well as recommend mitigation measures and rehabilitation measures for the proposed development.

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### 10.6.1 Assumptions and Limitations

- Wetland boundaries are essentially based on GPS coordinate waypoints taken onsite of wetland indicator features. The accuracy of the GPS device, therefore, affects the accuracy of the maps produced. A hand-held Garmin Montana 680 was used to delineate the wetland boundaries.
- The assessment of the present ecological state (PES), the provision of ecosystem goods and services, and the ecological importance and sensitivity of the identified wetland systems were based on a one-day field investigation. Site visits should ideally be conducted over differing seasons to better understand the hydrological and geomorphologic processes driving the characteristics of the water resource and the functional integrity of the wetland system. Once-off

assessments such as this may potentially miss certain ecological information, thus limiting accuracy, detail, and confidence.

- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological issues arising from the field survey and based on the assessor's working knowledge and experience with similar development projects. No construction work methodology was provided.

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### 10.6.2 Methodology

The Wetland delineation assessment was conducted by the means of the following:

- i. A desktop study was involved the examination of aerial photography, GIS databases including the NFEPA and South African National Wetland maps as well as literature reviews of the study site.
- ii. Field assessment.

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### 10.6.3 Impact Assessment

*'Excerpt from the Wetland Delineation Assessment'*

The Wetlands identified are moderately transformed and impacted by historical and ongoing anthropogenic activities. Wetland B is a small-scale wetland unit that interconnects to a larger wetland system to the south (Wetland A). The wetland located near the power station (Wetland C) was determined to be historically impacted by the construction and operation of the power station and associated stormwater infrastructure. The Present Ecological Status (PES) for wetlands B & C (seeps) scored moderate and high for wetland A (floodplain) respectively. The Ecological Importance and Sensitivity (EIS) falls in the mid-range and has high functionality in respect of hydrological functions. The Recommended Ecological Category (REC) for the wetlands were categorised as moderate. It will thus require some rehabilitation to enhance the ecological function of the system. Wetlands B and C are considered sensitive and important at a local and provincial scale, while wetland A is considered ecologically important and sensitive at a national scale, and its biodiversity is sensitive to flow and habitat modifications. Wetland A plays a role in moderating the quantity and quality of water from major rivers. The impact assessment showed that the proposed powerline would minorly impact the identified wetlands.

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### 10.6.4 Conclusion and Recommendations

In conclusion, both corridors are viable since they are located within the same environment, and as such, there is no advantage or disadvantage in proceeding with any of the two alternatives. In addition, no

significant impacts are associated with the development of any of the proposed corridors that cannot be reduced to a manageable level through mitigation. It should also be noted that the work proposed at the existing RWB substation will have an insignificant impact. Provided the recommendations suggested in this report are followed, there is no objection to the proposed development in terms of the wetlands of the study area.

## 11 CONCLUSION

The “feasibility” and “reasonability” of the corridor were measured against the general purpose, requirements and need of the activity and how it impacts the environment and the community that may be affected by the activity. It was, therefore, vital that the identification, investigation and assessment of the corridor address the issues/impacts of the proposed development. To evacuate power from the authorized Lethabo Solar Plant, Eskom intends to construct a 132kV power line and upgrade the Lethabo RWB substation. A Basic Assessment was therefore undertaken per the amended EIA Regulations, GNR326 of 2017. Two alternative corridors (A and B) were assessed. These traverse across the same area characterized by agricultural farms, wetlands, alien species and is near the Vaal River. Based on the screening report compiled from the DFFE Screening tool and Site Sensitivity verification undertaken, the following specialist studies were commissioned to fully assess the potential impacts: Avi-fauna, Biodiversity, Heritage, Hydrology, Palaeontology, and Wetland Delineation. Based on the outcome of this assessment, the EAP must recommend to the Department of Forestry, Fisheries and Environment (DFFE) whether the project should be approved and the conditions and/or stipulations of such approval. The recommendations are based on the following:

- The information provided by the applicant concerning the project activities.
- Legislative requirements.
- Assumptions and limitations during the assessment.
- The specialists' input.
- Geographic Information Systems.
- The public input, i.e., stakeholders and Interested and affected parties; and
- The EAP's professional experience.

### 11.1 SUMMARY

In summary, the key findings identified in this assessment are detailed below:

The proposed site is within Central Free State grassland which is not vulnerable. However, the Free State CBA and ESA Map classify the study area as Ecological Support Areas 1 and 2, making it sensitive. Of note is that the proposed project area accounts for less than 0.1% of the ESAs within the province, and no threatened, near threatened or protected plant species were confirmed during the assessment. Therefore, the significance of the impact on floral habitat, SCC and species is deemed low. Regarding water resources, the corridors and RWB substation do not fall within the Vaal River's 1:50 or 1:100-year

floodline. The Wetlands identified are moderately transformed and impacted by historical and ongoing anthropogenic activities. The corridors traversing across and near wetlands will result in further resource degradation. However, the impact assessment has shown that the proposed powerline would minorly impact the identified wetlands.

Due to anthropogenic activities, such as industrial, urban, and peri-urban, the landscape has been transformed, negatively impacting avifaunal diversity and abundance with the PAOI. The construction of the 132kV power line and bay and busbar extensions within the RWB Substation will result in impacts of moderate-low significance to birds in the vicinity of the new infrastructure, which can be reduced further through mitigation measures.

Regarding heritage assessment, the probability of locating any important archaeological remains dating to the Stone or Iron Age during the project's construction is rated as low. In addition, no grave sites were noted since the area is disturbed; hence the significance of destroying archaeological findings is low. Similarly, no fossils have been recorded from the site, and it appears to have been cleared for agriculture in the past; hence the impact is also deemed low. Visually, the project is deemed to have a low significance due to the presence of Lethabo Power Station and other power lines that have formed a backdrop. Based on these conclusions, the negative impact anticipated with the development is deemed acceptable with implementing mitigation measures. Reference is made to the figure overleaf for the Sensitivity Map of the preferred corridor alternative.

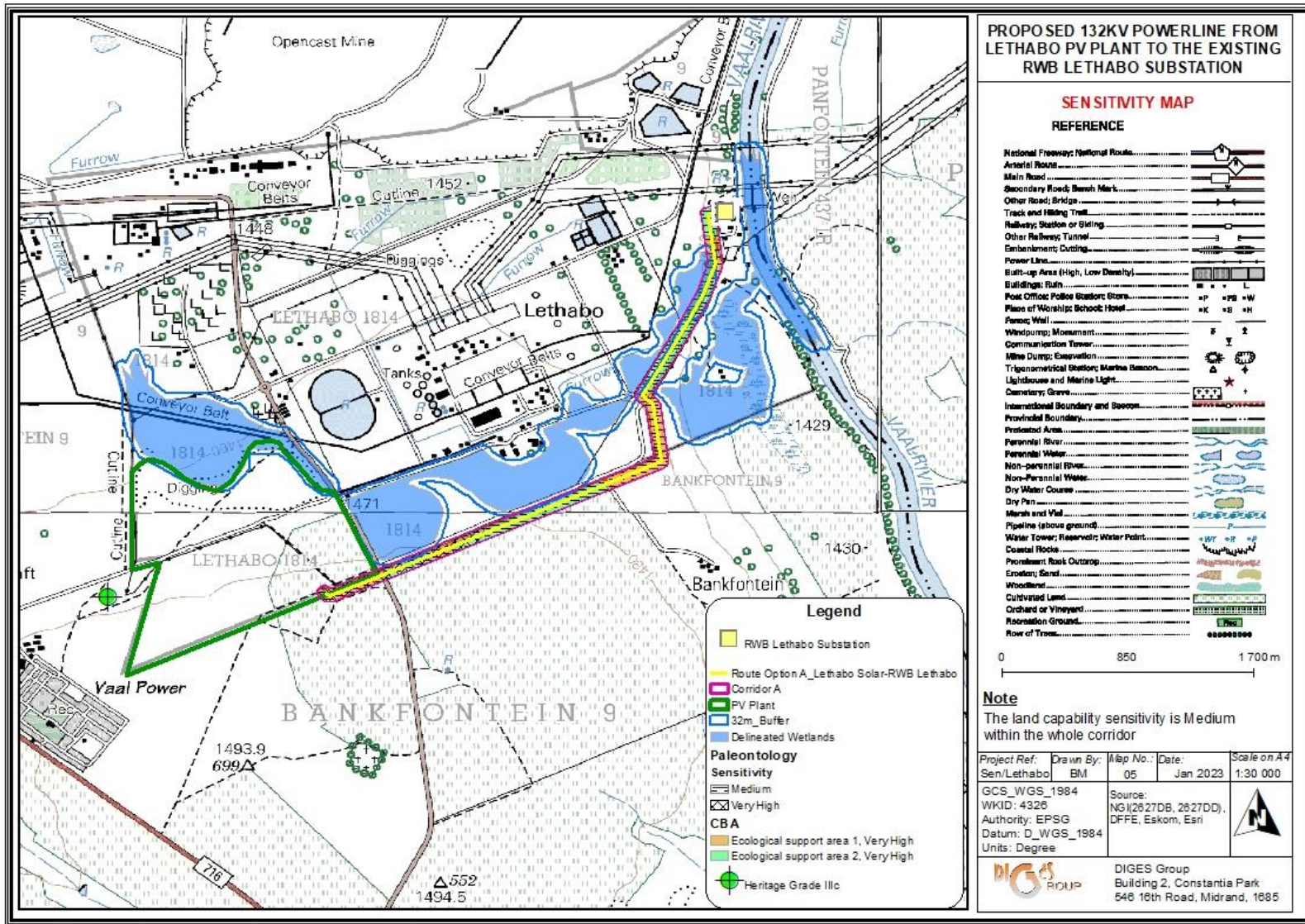


Figure 11-1: Sensitivity Map

## 11.2 ENVIRONMENTAL IMPACT STATEMENT

This Basic Assessment has shown that the proposed project will result in negative impacts; however, when mitigated adequately, these impacts will result in low residual impacts. It has also shown that there will be positive impacts, such as the creation of employment opportunities, a boost in the local economy, and a positive step in achieving the targets set for the utilisation of clean (renewable) energy. It should also be noted that Lethabo Solar Plant was authorized, and a line is required to evacuate electricity from the Lethabo Solar PV Plant to the grid, RWB substation.

The avifauna, biodiversity, heritage, palaeontology and wetland specialists' assessments have concluded that the project is viable if all the mitigation measures stated are effectively implemented. In the interest of sustainable development, the specialists' recommendations and my professional experience on related projects, I, as an EAP, recommend Corridor 1, associated infrastructure and the additional 88 kV bay at Lethabo RWB Substation be authorized subject to the following recommendations being included in the Environmental Authorization:

- ❑ The stipulations and provisions of the attached Environmental Management Programme on Appendix G be conveyed to and familiarized by the contractor and workers responsible for construction;
- ❑ Permits required by Eskom Holdings SOC Ltd from other competent authorities should be acquired before the commencement of the activity.
- ❑ An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with the conditions of approval.
- ❑ The 132kV power line must be constructed using a bird friendly structure.
- ❑ The recommendations of the Terrestrial biodiversity specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- ❑ If collision or electrocution impacts are recorded once the 132kV power line are operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.
- ❑ Pre-construction education and awareness training should include archaeology and palaeontology aspects.
- ❑ Construction footprints must be designated before the commencement of the construction and edge effects must be controlled from construction activities
- ❑ All measures regarding waste management must be undertaken using an integrated waste management approach.

- ❑ Clearance of vegetation must only be done on areas earmarked to avoid disturbance of the ecosystem.

### 11.3 ENVIRONMENTAL MANAGEMENT PROGRAMME

The mitigatory measures recommended describe possible actions to reduce the significant adverse environmental impacts identified in the assessment. As per Government Notice 435 of March 2019, a project that entails the construction of power lines and substations should submit a generic EMPr as developed by the Competent Authority. The plan provides guidelines for the planning, construction, operation, and maintenance of the proposed power line and substation works and a holistic management and monitoring plan for the entire project. The relevant Sections, as determined, have been completed, and the EMPr is appended to this report in Appendix G.

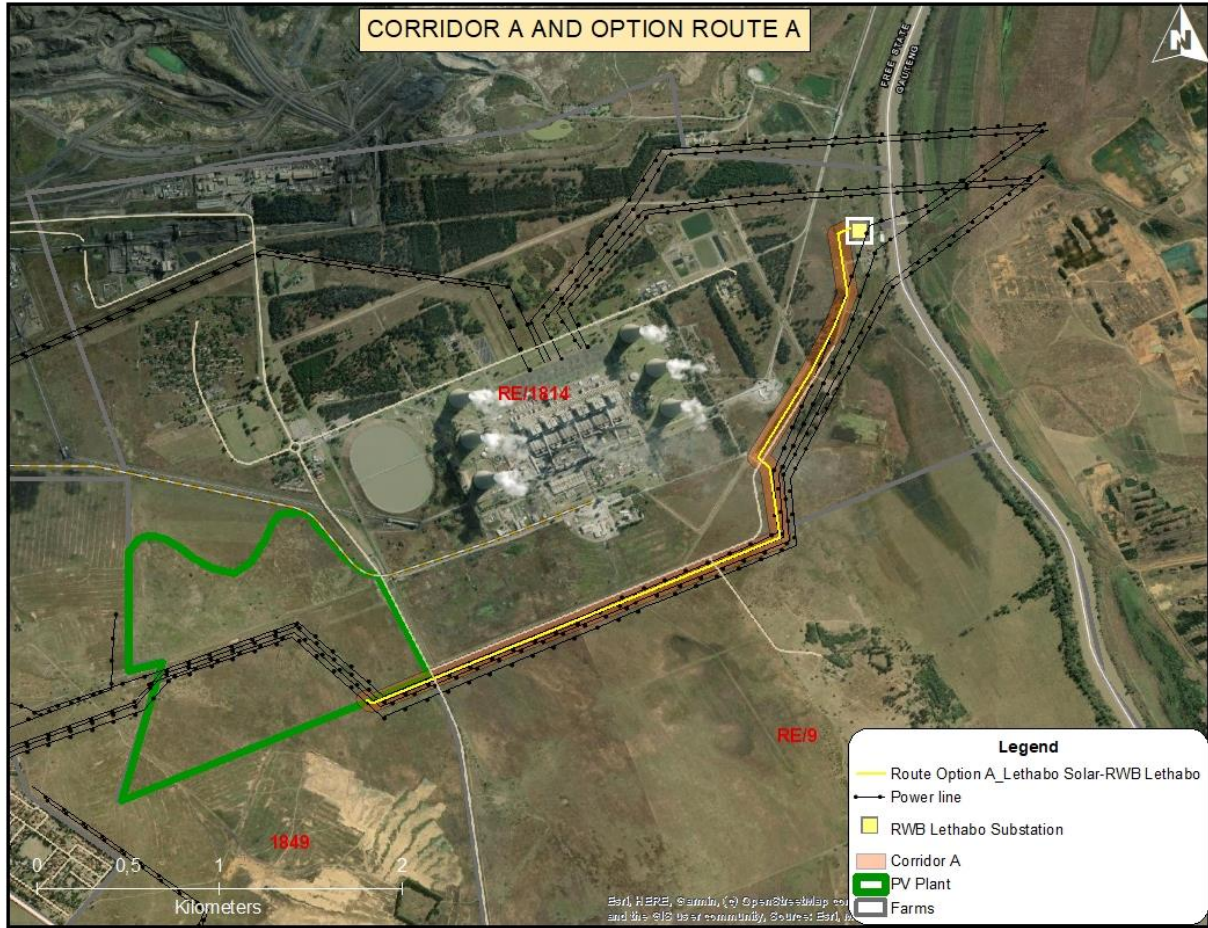
### 11.4 CONCLUSION

In addition to the negative impacts, the project will also have positive impacts, such as contribution to clean energy, employment and it will encourage the growth and emergence of small businesses during the construction phase. Implementing the mitigation measures outlined in the EMPr (**attached as Appendix G**) will lessen the significance of the identified adverse impacts. The EAP, therefore, recommends that the 132kV power line corridor and 88kV bay at Lethabo RWB Substation be approved. It is requested that the Environmental Authorization be valid for ten (10) years, as the commencement of the project is expected in 2024. The co-ordinates for the recommended corridor are as follows:

|                                    | Route Option A                         |
|------------------------------------|--|
| <b>Start (Lethabo Solar Plant)</b> | 26° 45' 17,278" S<br>27° 57' 58,783" E |
| <b>Mid-point</b>                   | 26° 44' 51,915" S<br>27° 59' 4,191" E  |
| <b>End (RWB Substation)</b>        | 26° 43' 53,679" S<br>27° 59' 24,735" E |

Reference is made to Figure 11-2 below for the recommended corridor.





**Figure 11-2: Recommended Corridor**

## 11.5 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

The EAP has considered the requirements outlined in the EIA 2017 Regulation as amended as well as other pertinent Acts and Regulations when completing the draft Basic Assessment Report. The EAP hereby attests that, based on the data available at the time the Basic Assessment Report was written, the following factors were considered:

- The correctness of the information provided in the report;
- Any information provided by the EAP to the interested and affected parties.

The draft Basic Assessment Report includes the Specialist Reports and the Environmental Management Programmes, which will be made available to IAPs and stakeholders for a 30-day review and comment period. The Issues and Response Report will be attached to the final Basic Assessment Report and it will address and contain any comments or issues submitted by the IAPs and stakeholders.



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**Signature**

10 July 2023

**Date**

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