

SCOPING OF ISSUES ASSOCIATED WITH THE PROPOSED PHOEBUS AND KWAGGA SUBSTATIONS

CHAPTER 6

This section of the Scoping Report identifies the potential positive and negative environmental (biophysical and social) impacts associated with the proposed establishment of Phoebus Substation and extension of the existing Kwagga substation (Please note that no site alternatives for the substations were considered during this study). A number of issues for consideration were identified through an evaluation of the proposed project, involving the project proponent, specialists with experience in EIAs for similar projects and in the study area, and a consultation process with key stakeholders that includes both government authorities and interested and affected parties (I&APs). In order to evaluate issues and assign an order of priority, it was necessary to identify the characteristics of each potential issue/impact:

- » *the nature*, which includes a description of what causes the effect, what will be affected and how it will be affected
- » *the extent*, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international

The detailed evaluation of the issues resulted in a statement regarding the potential significance of the identified issues will be undertaken during the EIA phase of the project.

Potential Impacts of the Environment on the proposed Project Infrastructure

6.1. Potential Impacts on Substation Infrastructure associated with Climate and Atmospheric Conditions

The local climate is anticipated to have very little impact on the proposed Phoebus and Kwagga substations as well as associated infrastructure, but may cause small variations in the transmission of electricity. Extreme phenomena are unlikely to pose a threat to the substation, although secondary effects such as flood conditions associated with high rainfall may present problems to the operation of the substation and transmission power lines.

6.1.1. Conclusions and Recommendations

As the proposed establishment of the Phoebus substation is located in close proximity to the existing Hangklip substation, it is anticipated that the same climatic conditions would be experienced as are currently experienced at this existing substation. In addition, the proposed extension to the existing Kwagga substation is within the existing substation

footprint southwards. Therefore, the impacts associated with climate would not differ between the sites.

6.2. Geology and Soils

The construction of the proposed substation requires foundations to be constructed in order to increase the stability of the structures. The depth of the foundations will be determined by the underlying geology of an area.

The greatest impact on the geology and soil associated with the construction of any structures is the potential for soil erosion. This impact depends on the soil erosion potential of the overlying soils. Erosion potential is anticipated to increase during the site clearance and construction activities of the proposed substation and associated infrastructure. The predicted impact is anticipated to be short-term construction impact on site.

6.2.1. Conclusions and Recommendations

Impacts on geology and soils are expected to be similar for the identified sites.

A detailed geotechnical survey of both substation site positions should be undertaken by Eskom during the design phase of the project in order to fully understand the soils in terms of founding conditions and erosion potential.

Detailed mitigation measures should be developed for the proposed site as part of the EIA phase of this project for inclusion in the draft Environmental Management Plan (EMP).

6.3. Potential Impacts on Surface Water Resources

Both the proposed Phoebus and existing Kwagga substations are located in areas that are not in the immediate proximity of areas of surface water. However, the proposed associated 400 kV lines might impact on certain drainage lines.

Areas of surface water contribute significantly towards the local and regional biodiversity of an area due to the atypical habitat that is present within the interface of terrestrial and aquatic habitat types. In addition, many flora and fauna species are specifically adapted to exploit the temporal or seasonal fluctuation in moisture levels in these areas and exhibits extremely narrow habitat variation tolerance levels.

Ecotonal interface areas form extremely narrow bands around areas of surface water and they constitute extremely small portions when calculated on a purely mathematical basis. However, considering the high species richness, these areas are extremely important on a local and regional scale. Rivers also represent important linear migration

routes for a number of fauna species as well as a distribution method for plant seeds. These aquatic habitat types are usually small and narrow. Plains and areas where low slopes prevail are usually characterised by the presence of few, but large, rivers and pans, comprising extensive surface areas.

6.4. Potential Impacts on Biodiversity (Refer to Appendix I)

No impacts were identified that could lead to a beneficial impact on the ecological environment of the study area since the proposed development is largely destructive (refer to Figures 5.1 and 5.2). A measure of estimation is therefore necessary in order to evaluate these impacts. Lastly, cumulative impacts place direct and indirect impacts of this project in a regional and national context, particularly in view of similar or resultant developments and activities in the immediate surrounds of this proposed development.

6.4.1. Conclusions and Recommendations

Impacts in sensitive areas are not expected to occur as a result of the establishment of the proposed Phoebus substation or the extension of the existing Kwagga Substation. It is largely possible to mitigate any significant impacts and limit the extent of ecological degradation by means of localised realignments and site-specific mitigation measures.

Phoebus Substation

No significant or sensitive natural features are present within the proposed site for Phoebus Substation. The site is located in close proximity to an existing substation (i.e. Hangklip Substation) and the construction and operation of the new substation is not foreseen to result in significant impacts on the natural environment as access to the site already exists.

Kwagga Substation

The extension of the existing Kwagga Substation is not foreseen to result in significant impacts on the natural environment. The proposed site is located in a generally degraded and transformed area and no sensitive biological elements are expected to occur.

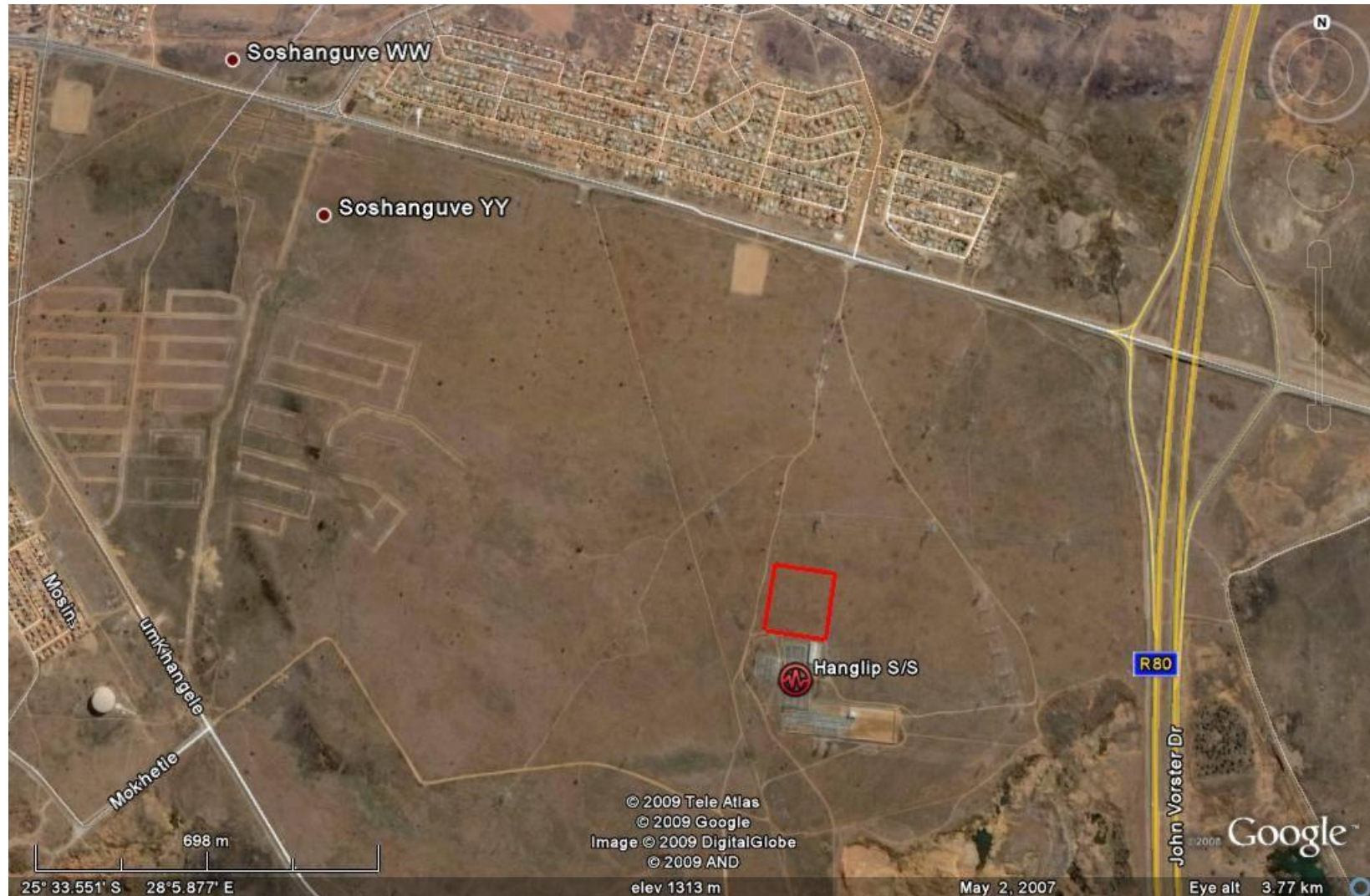


Figure 6.1: Map showing the proposed Phoebus Substation Site



Figure 6.2: Map showing the proposed extension to Kwagga Substation

6.5. Potential Impacts on Avifauna (Refer to Appendix J)

Due of their size and prominence, electrical infrastructures constitute an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but one problem in southern Africa is the electrocution of birds (and other animals).. Other problems include: disturbance and habitat destruction during the construction and maintenance activities associated with electrical infrastructure.

Two common problems in southern Africa associated with electrical infrastructure are electrocution of birds (and other animals) and birds colliding with power lines.

6.5.1. Strategic Environmental Assessment

The Strategic Environmental Assessment (SEA) was compiled in April 2008 for avian sensitivity zones for the Pretoria Field Service Area network master plan. The study area extends from the Midrand area in the south to Pylkom and Klipvoorstad in the north, Ekangala and Bronkhorstspuit in the east and Tantana in the west and includes the current study site.

6.5.2. Conclusions and Recommendations

No significant impacts or fatal flaws have been identified at this stage. The proposed site locations described in this report should be further studied at EIA phase and the impacts on Avifauna, Biodiversity etc. should be assessed in further detail.

6.6. Potential Impacts on Visual/Aesthetic Aspects (Refer to Appendix L)

Initial viewshed analyses of the two proposed substation sites, based on a 20 m contour interval digital terrain model (DTM) of the study area, indicate the potential visual exposure of each substation site and its associated turn-in line infrastructure (refer to Figure 6.3). The object offsets for the viewshed analyses were taken at 20 m above average ground level (i.e. the approximate height of the substation structures) and the visibility was calculated for a radius of 5km from each site. The viewshed analyses do not include the potential visual absorption effect of the natural vegetation and represent the 'theoretical visibility' of the proposed substation from the alternative sites.

The proposed extension of Kwagga substation should not have any visual impact from settlements or major roads because it is an existing substation.

The proposed Phoebus substation site has the potential to be visually exposed to fairly large areas. This is based on the theoretical visibility as indicated by the preliminary viewshed analyses undertaken from each of these sites as well as the extent (600m²) of the proposed substation.

6.6.1. Conclusions and Recommendations

The visual impact assessment within the EIA will address these and other crucial issues related to the visibility of the proposed Phoebus substation.

6.7. Potential Impacts on Heritage Sites (Refer to Appendix K)

The proposed Tshwane Strengthening Project may have an impact on any of the possible types and ranges of heritage resources ('national estate') that may occur in the Project Area. Therefore, a Phase 1 HIA for the Tshwane Strengthening Project Area has to be undertaken to comply with Section 38 of the National Heritage Resources Act (No 25 of 1999).

The Phase 1 HIA study

The Phase 1 HIA study will consist of a reconnaissance of the Project Area with a vehicle while sensitive spots and areas will be surveyed on foot. The Phase 1 HIA study will also include the geo-referencing, mapping, photographing and describing of any heritage resources and graveyards which may exist in or near the Project Area.

Mitigation measures will be proposed for those heritage resources that may be affected by the Tshwane Strengthening Project. Most of these mitigation measures are generally referred to as Phase II investigations. The Phase I HIA report will also outline management proposals for any heritage resources that may continue to exist unaffected in the Project Area in the short-, medium- or long-term.

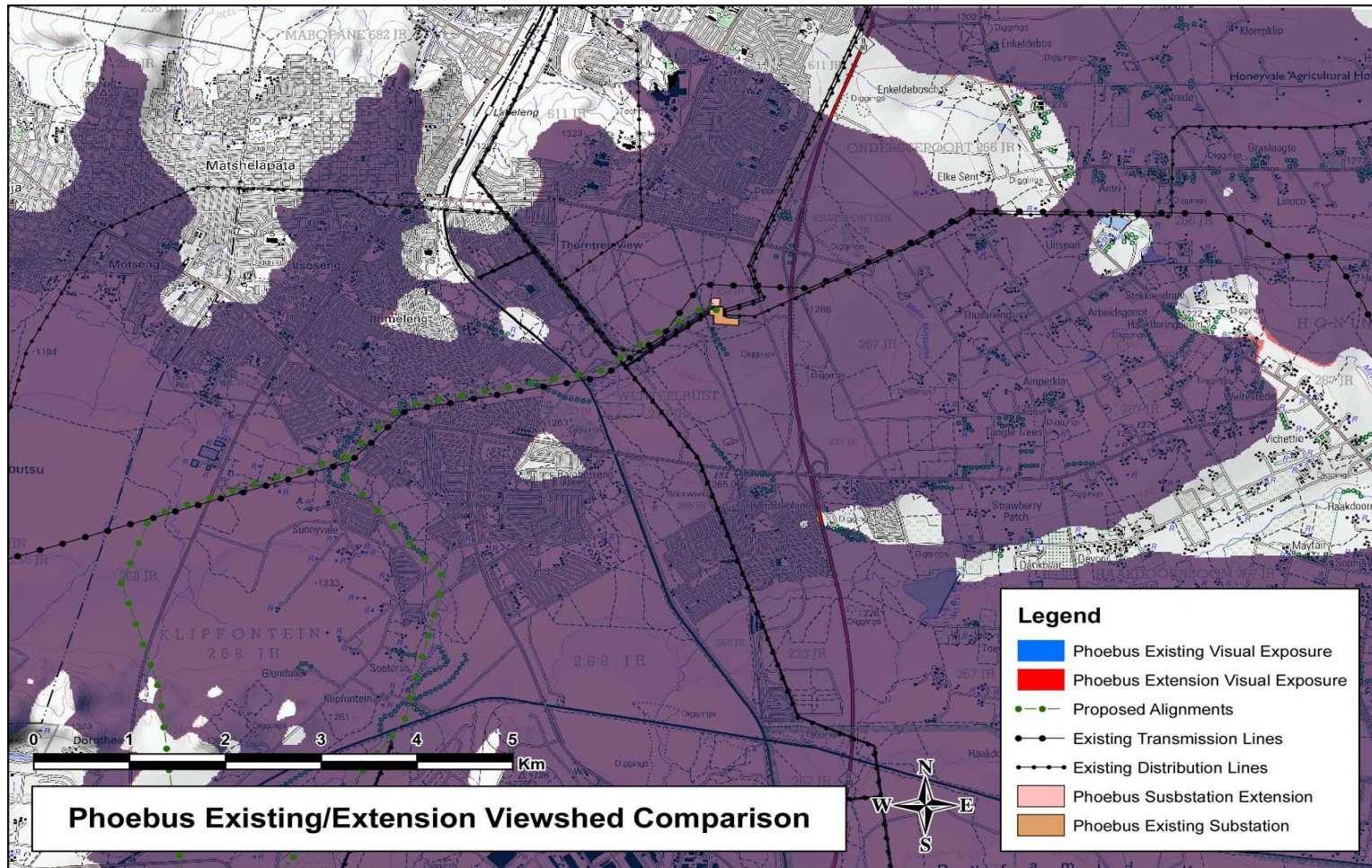


Figure 6.1: Map showing the potential visual exposure at the Phoebus Substation

Protecting and managing the national estate

The Phase 1 HIA study will provide mitigation and management measures for heritage resources that may be affected (demolished, altered, and removed) during the construction, operation or maintenance of the Tshwane Strengthening Project.

The protection and management of the national estate usually occurs through formal and general protection measures.

Mitigation measures (Phase 2 studies) that may be applied to any of the possible types and ranges of heritage resources that may be affected in the Project Area will involve some of those listed under 'general protection'.

Phase 2 investigations

Phase 2 studies include in-depth heritage studies and vary according to the types and ranges of heritage resources that may be affected. These studies include the documentation of sites dating from the Stone Age, Iron Age and the Historical Period by means of mapping (surveying), excavating, photographing and describing archaeological sites. Excavations of archaeological sites could be followed by laboratory work when archaeological collections have to be studied and analysed.

6.7.1. Conclusions and Recommendations

The proposed Tshwane Strengthening Project Phase 1 may impact on South Africa's 'national estate' which comprises a wide range of heritage resources, some of which may occur in Tshwane Strengthening Project Area (see Part 2, 'The National Estate'). Therefore, ultimately, a Phase 1 Heritage Impact Assessment (HIA) has to be undertaken for the Tshwane Strengthening Project as outlined in Section 38 of the National Heritage Resources Act (No 25 of 1999).

6.8. Potential Impacts on the Social and Economic Environment (Refer to Appendix M)

The infrastructure development associated with the Kwagga substation extension and the proposed new Phoebus substation is located in its entirety within the City of Tshwane of the Gauteng Province.

The transmission power line begins at the Kwagga substation which is located in Kwaggasrand (Pretoria West) and terminates at the new Phoebus substation which would be located in Soshanguve (City of Tshwane Rural).

A **change process** can be defined as change that takes place within the receiving environment as a result of a direct or indirect intervention. A potential **impact** follows as a result of the change process. However, a change process can only result in an

impact once it is experienced as such by an individual/community on a physical and/or cognitive level.

The categories of processes are as follows:

- **Demographic Processes:** number and composition of the local population;
- **Geographic Processes:** land use pattern within (affected) area;
- **Economic Processes:** way in which people make a living and the economic activities within a specific (affected) area;
- **Institutional and Empowerment Processes:** people's ability to become actively involved and influence the decision making process,; and
- **Socio-Cultural Processes:** way in which humans interact and relate to each other within the context of their environment.

6.8.1. Demographic Change Processes

Demographical processes relate to the number of people and the composition of a community and include an overview of the population size, the race, age, gender and educational profile of a population as well as household compositions (refer to Table 5.1).

The construction and maintenance of the proposed substation and associated infrastructure could lead to a change in the number and composition of the population within the affected local area, which in turn could lead to economic, land use, and socio-cultural change processes. The potential impact(s) that follow from a particular change process taking place will be assessed in detail during the Environmental Impact Assessment phase.

6.8.2. Economic Change Processes

Economic change processes relate to the changes brought about to the employment and general economic profile of an area as a result of the introduction of any development for instance job opportunities might be created as a result of the construction and maintenance of the proposed substation and associated infrastructure. Employment creates a source of income, which in turn enables the employed individual to access services and a support mechanism for his/her family (refer to Table 5.2).

In the event of a potential impact being identified as a category 2 impact; a brief assessment was conducted to determine which transmission power line route alternative would create change processes with the least amount of significant impacts, in order to determine a preliminary indication for a preferred transmission power line route alternative.

The proposed new substation and extension might not impact on any property values as well as land used for other purposes because both of them are located within the footprints of existing substations.

6.8.3. Empowerment and Institutional Change Processes

Institutional processes relate to the role, efficiency and operation of government sectors and other organisations within the area in terms of service delivery during construction (refer to Table 5.3). As was previously mentioned, the presence of construction workers may put additional strain on municipalities, which might impact on health. Empowerment processes investigate the ability of people to engage in decision-making processes to an extent that they have an impact on the way in which decisions are made which would concern them.

In terms of institutional change processes, the disadvantages of locating the site far from existing settlements would appear that it would increase the distance that would have to be traversed by services infrastructure such as electricity supply and sanitation to the site and construction village, notably during construction. Therefore, it would increase the burden on local authorities that are required to provide that infrastructure.

6.8.4. Socio-Cultural Change Processes

Socio-cultural processes relate to the way in which humans behave, interact and relate to each other and their environment, as well as the belief and value systems which guide these interactions (refer to Table 5.4).

The proposed Phoebus substation will be located within Soshanguve, which is a township situated approximately 45 km north of Pretoria. Soshanguve was incorporated into the City of Tshwane Metropolitan Municipality (CTMM) and in January 2006 was the scene of riots, due to poor service delivery.

In terms of socio-cultural processes it should be noted that sense of place goes hand in hand with place attachment, which is the sense of connectedness a person/community feels towards certain places.

Socio-cultural change processes that are associated with the construction and operation of the proposed project include changes such as health and safety aspects and sense of place.

These potential impacts will be assessed in detail during the Environmental Impact Assessment phase.

6.8.5. Geographical Change Processes

Geographical change processes refer to land use changes as a result of the actual or perceived changes in land use, whether it be on a temporary or permanent basis (refer to Table 5.5). The construction and maintenance of the proposed substation, transmission power line and associated infrastructure could lead to a change in the land use within the local area, most notably along the servitude. These potential impacts will be assessed in detail during the Environmental Impact Assessment phase.

To fully assess the potential impacts as a result of geographical change processes, more information is needed on the following aspects:

- » The size and number of expected construction and operational vehicles as well as which route(s) will be used to gain access to the various construction sites; and
- » Planned developments for the study area.

6.8.6. Conclusions and Recommendations

The scoping report fulfilled the objectives of the Scoping Phase, which were to complete a broad assessment of the project from a social perspective to enable a more focussed study in the Environmental Impact Assessment (refer to Table 5.6).

During the scoping study, no issues emerged that can be considered as fatal flaws from a social perspective. However, there are areas of concern as outlined in this report and therefore careful consideration should be given to the enhancement and/or mitigation measures (that will be proposed during the next phase of the project), both during the construction as well as the operation phases of the project.