**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

**for the**

# PROPOSED DEVELOPMENT OF THE BOJANALA SPECIAL ECONOMIC ZONE (SEZ) AND ASSOCIATED INFRASTRUCTURES IN NORTH WEST PROVINCE

(ref#: 14/12/16/3/3/2/2178)

## DRAFT EIA REPORT

## PUBLIC REVIEW
**03 February 2023 to 06 March 2023**


**COMPILED BY:**

**Envirolution Consulting (Pty) Ltd**
PO Box 1898
Sunninghill
2157
Tel: (0861) 44 44 99
Fax: (0861) 62 62 22
E-mail: info@envirolution.co.za
Website: www.envirolution.co.za

**PREPARED FOR:**

**North West Development Corporation**
PO Box 3011,
Mmabatho,
2735
Tel: 018 381 3663
Fax:018 381 2041
Website: https://nwdc.co.za/

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## PROJECT DETAILS

| | | |
|---|---|---|
| **Reference No.** | **:** | 14/12/16/3/3/2/2178 |
| **Title** | | : The Proposed Development of the Bojanala Special Economic Zone (SEZ) And Associated Infrastructures in North West Province |
| **Report compiled by:** | | **Envirolution Consulting (Pty) Ltd**<br>Contact person: Ms Sheila Bolingo<br>Postal Address: P.O. Box 1898, Sunninghill, 2157<br>Telephone Number: 0861 44 44 99<br>Fax Number: 0861 62 62 22<br>Email: sheila@envirolution.co.za |
| **Client** | : | **North West Development Corporation** |
| **Status** | **:** | Draft EIA Report for public review |
| **Date** | **:** | **03 February 2023 to 06 March 2023** |

## INVITATION TO COMMENT ON THE DRAFT EIA REPORT

The **Draft EIA Report** was made available for public review and comment at the following locations from:
**03 February 2023 to 06 March 2023**

**Mogwase Public Library**

935 Station Road,
Mogwase
Contact Details: Bongile Mathinii:
Tel: 014 555 1449/ 1451

**IAPs were requested to submit comments to:**

| | |
|---|---|
| Company Name: | Envirolution Consulting (Pty) Ltd |
| Name: | Sheila Bolingo |
| Physical Address: | Vista Place, Suite 1a & 2, No 52 Cnr Vorster Avenue & Glen Avenue, Glenanda |
| Postal Address: | PO Box 1898, Sunninghill, 2157 |
| Telephone Number: | (0861) 44 44 99 |
| Fax Number: | (0861) 62 62 22 |
| E-mail: | sheila@envirolution.co.za |

Comments can be made as written submission via fax, post or e-mail.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **BAR** | Basic Assessment Report |
| **BPDM** | Bojanala Platinum District Municipality, |
| **CBA** | Critical Biodiversity Area |
| **DFFE** | Department of Forestry, Fisheries and the Environment |
| **DMR** | Department of Mineral Resources |
| **DWS** | Department of Water and Sanitation |
| **EAP** | Environmental Assessment Practitioner |
| **ESA** | Ecological Support Area |
| **EIA** | Environmental Impact Assessment |
| **EMPr** | Environmental Management Programme |
| **GN** | Government Notice |
| **Ha** | Hectares |
| **HIA** | Heritage Impact Assessment |
| **HV** | High Voltage |
| **I&APs** | Interested and Affected Parties |
| **kV** | Kilo Volt |
| **NEMA** | National Environmental Management Act (No. 107 of 1998) (as amended) |
| **NHRA** | National Heritage Resources Act (No. 25 of 1999) |
| **NWA** | National Water Act (No 36 of 1998) |
| **NWDC** | North West Development Corporation |
| **NW DEDECT** | North West Department: Economic Development, Environment, Conservation and Tourism |
| **MKLM** | Moses Kotane Local Municipality |
| **PAOI** | Project area of influence |
| **SAHRA** | South African Heritage Resources Agency |
| **SEZ** | Special Economic Zone |
| **SCC** | Plant species of conservation concern |
| **SR** | Scoping Report |
| **SDF** | Spatial Development Framework |
| **SEZ** | Special Economic Zone |
| **the DTIC** | National Department of Trade and Industry |
| **WWTP** | Water Works Treatment Plant |

# EXECUTIVE SUMMARY

## INTRODUCTION

**North West Development Corporation (NWDC)** is the official agency that assists with the planning, financing, coordinating, promoting and carrying out the economic development as well as promoting trade and investment within the province, and its people in the field of industry, commerce, finance, mining and other business, resulting in wealth and job creation. One of the ways that the NWDC achieves this objective is through the initiative of the National Department of Trade and Industry (the dtic) to implement the Special Economic Zone (SEZ) Policy and the subsequent roll-out.

NWDC is in the process of implementing the Bojanala SEZ located in Mogwase Moses Kotane Local Municipality on behalf of the North West Province (see **Figure 1**). The SEZ will focus on platinum beneficiation, mining equipment, agro-processing and renewable energy sectors.

'*Bojanala Vision is to promotion of Socio-economic Development.' The Bojanala SEZ development will effectively and efficiently contribute to the improvement and growth of South African economy and society mainly by attracting more FDI. The progress of equal development throughout the country will be measured by the development of industry and job opportunity expansion in the NWDC and MKLM region(s) in order to create sustainable resources utilization and environmental preservation*". "*Bojanala* is *to encourage expansion of investment by private sectors with increased foreign direct investment (FDI) to South Africa, and to give favourable impact on the economy and the industry toward enhancement of industrial competitiveness and structural adjustment to investment-driven economic growth."*
*Concurrently, the keys to the success of FDI promotion is the attractiveness of business location, preferable business incentives, developed infrastructure, capable labour force, and reasonable development cost provided to the promising investors. The mission of the development is to prepare an SEZ facilitated with these attractive business environments".*

The nature and extent of this project, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Scoping Report. This assessment focuses on the land clearance and construction of bulk services The specific individual industrial and commercial activities or projects that will be on the SEZ will assess their specific technology alternatives during their individual environmental authorisation application processes.

## REQUIREMENT FOR A SCOPING & EIA PROCESS

The construction and operation of the proposed the Bojanala Special Economic Zone (SEZ) is subject to the requirements of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA) 107 of 1998. This section provides a brief overview of the EIA Regulations and their application to this project. NEMA is the national legislation that provides for the authorisation of 'listed activities. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these activities must be considered, investigated, assessed and reported on to the competent authority that has been charged by NEMA with the responsibility of granting environmental authorisations.

The need to comply with the requirements of the EIA Regulations ensures that the competent authority is provided with the opportunity to consider the potential environmental impacts of a project early in the project development process and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision. North West Development Corporation (NWDC) requires authorisation from the Department of Forestry, Fisheries and the Environment - DFFE (as the competent authority) for the development of the Bojanala Special Economic Zone (SEZ). Reason being, North West Development Corporation (NWDC) "the applicant" is an entity of the North West DEDECT, accordingly DFFE has been identified Competent Authority to consider the application in accordance with NEMA 24C (2) (d) (ii)which states:
(2) The Minister must be identified as the competent authority in terms of subsection (1), unless otherwise agreed to in terms of section 24C (3), if the activity—
(d) is undertaken, or is to be undertaken, by
(ii) a provincial department responsible for environmental affairs or any other organ of state performing a regulatory function and reporting to the MEC;

Infraconsult Engineering has appointed Envirolution Consulting (on behalf of NWDC) as the independent Environmental Assessment Practitioner (EAP) to conduct an EIA process for the proposed project.

The proposed Bojanala SEZ triggers a Full Scoping and EIA Process due to listed activities triggered from Listing Notice 1 (GN R. 327), 2 (GN R. 325) and 3 (GN R. 324). The proposed development requires a Full Scoping and EIA due to the GN R Activity 15 of GN325 i.e. *the clearance of an area of 20 hectares or more of indigenous vegetation.*

## PROJECT NEED AND DESIRABILITY

The promoters of Bojanala Valley vision the establishment of the proposed Bojanala SEZ in North West Province as a catalytic role towards the economic revival and development of the whole Bojanala region. Since, SEZs are expected to contribute towards strengthening South Africa's terms of trade through the export of value-added commodities, the creation of stronger value chains and provision of much-needed jobs in previously disadvantaged NWDC and MKLM regions. However, it will depend on the kind of packages made available to investors and the extent to which they will offset, for particular industries, any exogenous disadvantages experienced in locating in the SEZ.

Various policy plans have informed the planning of the SEZ

- The North West Province Spatial Development Framework
- The Bojanala Fourth Generation Integrated Development Plan
- The Bojanala Platinum District Environmental Management Framework
- The Moses Kotane Local Municipality Spatial Development Framework (Nov 2010)
- The updated Spatial Development Framework of Moses Kotane (2019-2024)

## IDENTIFICATION OF ALTERNATIVES

Appendix 2 Section 2 (h)(i) of the EIA Regulations, 2017, requires that all S&EIR processes must identify and describe alternatives

to the proposed activity that are feasible and reasonable'. The followings have been considered in terms of -

- The No Go Alternative
- Location Alternatives
- Layout Design Alternatives
- Technology alternatives

**CONCLUSION (IMPACT STATEMENT)**

The ecological impacts of all aspects for the proposed Bojanala SEZ and associated Bulk services were assessed and considered to be ecologically acceptable, provided that the mitigation measures provided in the report are implemented. All impacts are rated as MODERATE to HIGH pre-mitigation; therefore, implementation of recommended mitigation measures is an important element of the mitigation strategy. Implementing the recommended mitigations measures will reduce impacts to LOW.

None of the proposed alternatives are considered to be Fatally Flawed, for the most parts, impacts on the natural environment were the same for all alternatives. Thus, after assessing all alternatives on EIA phase level Alternative 2 was recommended for i) the Bulk Water Supply Line Pipe Material, ii) Electrical Powerline; and iii) the Stream Crossings then Alternative 1 is recommended for the Waste Water Treatment. The No-Go option refers to the proposed SEZ not being constructed. This option will therefore have no impact (positive or negative) on the local vegetation and biodiversity if it is not constructed. The local area is fairly developed with various industrial clusters, roads and medium density urban areas occurring.

In terms of cumulative impacts, the proposed line is in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Considering the findings of the specialist assessments undertaken for the project, cumulative impacts range from a low to moderate significance (on a landscape level in this region of Mogwase). The use of the EMPr and mitigation measures would assist in mitigating these negative impacts to an acceptable level.

Although a number of significant impacts are associated with the proposed SEZ, it is the professional opinion of Envirolution Consulting and the specialists that:

- The vast majority of environmental impacts identified can be adequately mitigated to reduce the impacts to an acceptable level, provided mitigation measures recommended in this report are implemented and maintained throughout the life of the project.
- The implementation of mitigation measures and recommendations must be consistently monitored by an independent Environmental Control Officer (ECO) during construction.
- The recommendations made by all specialists and the EAP in the EMPr (Appendix F) must be implemented.
- The information in the report is sufficient to allow DFFE to make an informed decision.

It is the opinion of Envirolution Consulting that NO FATAL FLAWS are associated with the proposed Bojanala SEZ and associated Bulk services

**RECOMMENDATIONS**

It is the opinion of Envirolution Consulting that the proposed Bojanala SEZ and associated Bulk services should be approved provided that appropriate mitigation measures are implemented and that the Environmental Management Programme (EMPr) is implemented, maintained and adapted to incorporate relevant legislation, standard requirements and audit reporting, throughout the life of the proposed SEZ.

The mitigation measures for all impacts identified in the EIA are provided in the detailed impact assessment in **Appendix E** and have been incorporated into the EMPr (**Appendix F**). The EMPr must be implemented by the relevant parties during all phases of development of the project i.e. Planning & Design, Construction and Operation phase. Inclusions, additions and adaptations of the EMPr, as well as all final plan drawings and maps must be submitted to DFFE for final approval. The following conditions would be required to be included within an authorisation issued for the project:

Site-specific conditions to be noted include:

**Aquatic and Wetland:**

- Mark all areas which don't form part of the proposed development within the watercourse as no-go areas.
- The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided;
- No pylons or towers must be established within or within 50m of any wetlands or riparian areas; where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following
- Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 30m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.

**Terrestrial Biodiversity**

- Removal of vegetation must be restricted to the proposed development footprints
- Plan to maintain naturally vegetated open spaces around drainage lines and through the development to ensure ecological corridor through the site.
- The route through the Pilanesberg National Park should be reconsidered and align as close as possible with the road reserve and fence line where historic disturbances took place.
- Trees underneath the powerline or along the works area for the pipeline must be pruned to acceptable heights, instead of clear-felling. This will limit degradation of the vegetation and the subsequent invasion by alien invasive plant species
- The specific individual industrial and commercial activities or projects that will be on the development site must assess their smaller footprint for plant species of conservation concern prior to commencement of planning activities. See Appendix C with regards to the two (2) species mostly likely to occur and their associated habitat preferences.
- Ensure that the environmental authorisation stipulates that provincial protected species can be removed / relocated or apply for a permit to do so.
- Survey the final footprints of pylons and pipelines for plant species of conservation concern. This must inform permit applications

- *Boophone distichia* and *Crinum* species must be relocated to outside of the development footprint if it will be impacted on.
- Provincially protected succulents should be relocated to open spaces outside of the development footprint with the permission of the local authority.
- Apply for permits for the destruction or pruning of national protected trees through the local Department of Forestry, Fisheries and the Environment (DFFE). Assessed areas that will be cleared for construction to determine the number of national protected tree species that will be affected. This will inform he permit application.

**Avifauna:**

- **Proximity of power line to Sun City sewage works:** It was noted that the proposed power line will run close to (south of) and parallel to the Sun City sewage works. This site likely attracts waterbirds and it would appear precautionary/prudent to also mark the stretch of line running parallel to the sewage works,
- **Proposed Powerline re-routing**: It would appear preferable for the routing of the new power line to be located south of the road as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA - the current proposed routing actually impinges on the protected area boundaries at one point. A further issue relevant to the power line is that close to its western end the proposed route is apparently north of the R556 road, whereas the other adjacent parallel existing power lines are situated south of this road.
- **Re Routing of Waterline route:** It is recommended that the pipeline follow this existing route

**Heritage:** Avoidance/Preserve is viewed to be the primary form of mitigation and the site should be retained in situ and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.

General conditions includes

- An independent **Environmental Control Officer (ECO)** should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.
- Upon approval of the project, an important component of the project would be to **fine-tune the 22m servitude** design (placement of the footprints) in terms of the receiving environment in the approved corridor of 100m wide. This would require a walk-down of the line and subsequent negotiations with all land owners to ascertain how the impacts on their properties can be mitigated, e.g through relocation of infrastructure, compensation or other acceptable measures. Construction will not be possible before agreements have been reached with all land owners along the entire route.
- Refinement of the preferred option should be done during design phase of the project, in particular once placement of the tower structures is planned. Avoidance of sensitive areas remains the best mitigation, followed by, minimisation, management and mitigation to maximum affect. Main features that need to be taken into consideration during detail design phase (and ultimately deciding where to place the tower structures) are to in as far as possible:
- Effective **stormwater management** should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost.
- **Sediment control** should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.
- **Follow the alignment** of infrastructure such as roads and existing power lines
- **Avoid impacting on tourist facilities** such as guesthouse, holiday resorts and eco-tourism areas,
- Creation of **new access roads** should be minimised as far as possible.
- The **visual and intrusion** impacts are of concern, as well as the negative impact on the property value. In this regard, it is therefore recommended that the entire property for the substations be obtained by Eskom. Should this mitigation measure be implemented.
- Should any **archaeological artefacts** be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency. Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared **alien plants** must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Rehabilitate construction sites by establishing with indigenous plant species, within the safety specifications for a power line. The 3m servitude for the underground cable servitude should be kept clear of plants to allow maintenance and repairs in future.
- Erosion control measures must be utilised during construction, operations, decommissioning and rehabilitation of the power lines, cables and substations.
- The developer should **obtain all necessary permits** prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species

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# 1 INTRODUCTION

## 1.1 Project Background

**North West Development Corporation (NWDC)** is the official agency that assists with the planning, financing, coordinating, promoting and carrying out the economic development as well as promoting trade and investment within the province, and its people in the field of industry, commerce, finance, mining and other business, resulting in wealth and job creation. One of the ways that the NWDC achieves this objective is through the initiative of the National Department of Trade and Industry (the dtic) to implement the Special Economic Zone (SEZ) Policy and the subsequent roll-out.

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The nature and extent of this project, as well as potential environmental impacts associated with the construction, operation and decommissioning phases are explored in more detail in this Report. This assessment focuses on the land clearance and construction of bulk services The specific individual industrial and commercial activities or projects that will be on the SEZ will assess their specific technology alternatives during their individual environmental authorisation application processes.

## 1.2 Conclusions from the Scoping Phase

At the scoping stage It is evident that the majority of potential impacts identified to be associated with the construction of the Bojanala SEZ project are anticipated to be localised and restricted to the proposed site itself while the Bulk Services impacts range from local to regional. Potential issues identified through this scoping study associated with the proposed SEZ are summarised in this section.

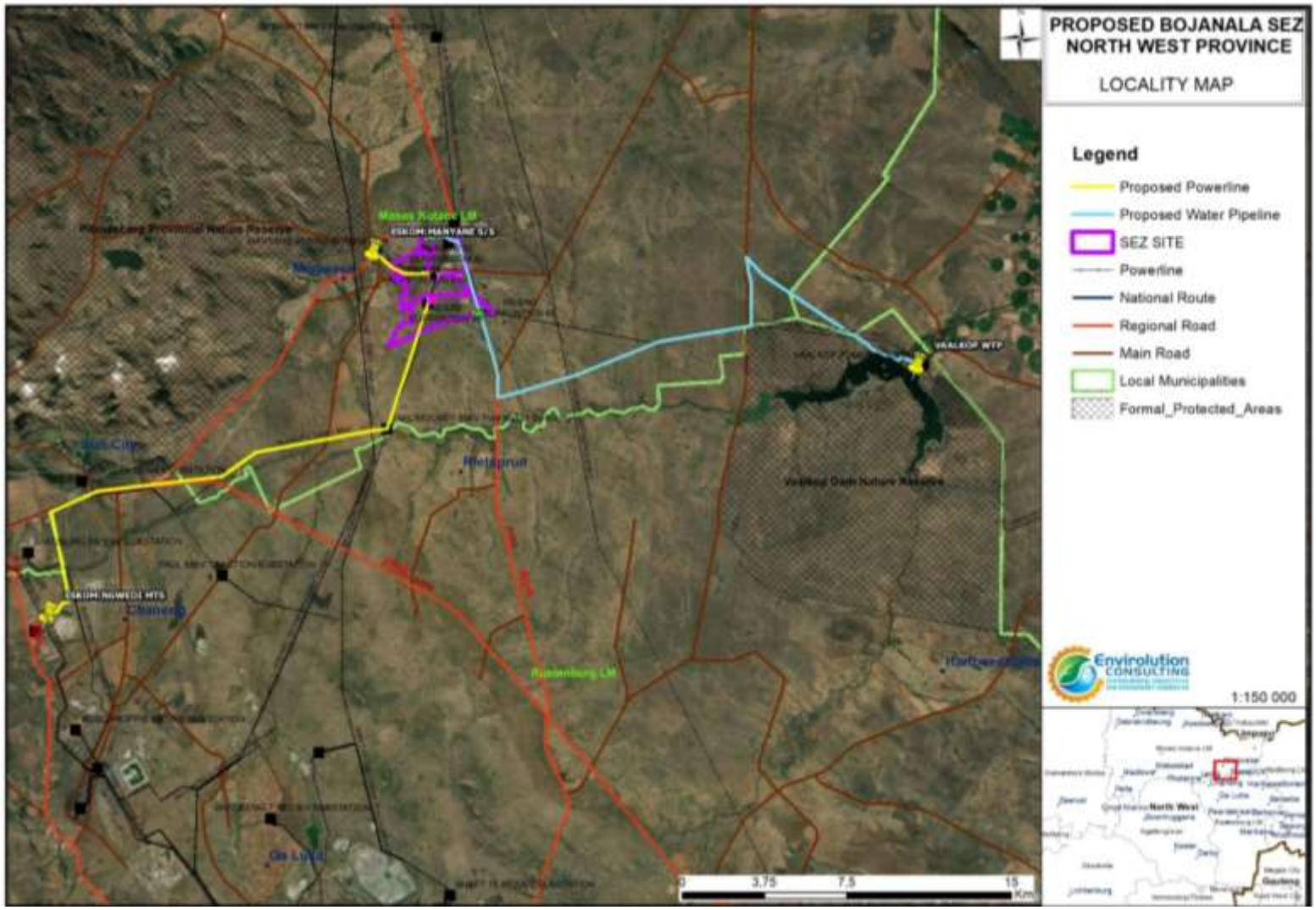


**Figure 1**: Regional Map

**Loss of vegetation:** It has been clearly demonstrated that vegetation not only forms the basis of the trophic pyramid in an ecosystem, but also plays a crucial role in providing the physical habitat within which organisms complete their life cycles (Kent & Coker 1992). Therefore, the vegetation of an area will largely determine the ecological sensitivity thereof. The vegetation that is possibly in secondary state as well as the modified land cannot contribute to the conservation of Central Sandy Bushveld. No plant species of conservation concern is likely to be present here either and it is probably of a low sensitivity to the proposed development. The Central Sandy Bushveld on the site would likely be in a good condition and although the presence of plant species of conservation concern is unlikely, several provincially protected plants, as well as national protected tree species can be present. This vegetation is provisionally classified as being of medium sensitivity. **Figure 2** geographically represents to potential sensitivity classification, based on the desktop assessment and the possibility to support plant species of conservation concern. Development activities of medium to high impact are acceptable within the medium and low sensitivity areas. Most types of development can proceed within low sensitivity with little to no impact on conservation worthy vegetation.

**Drainage within the site –** Activities in and near watercourses are regulated under NEMA and the NWA. The hydrological features and their associated buffer zones are considered sensitive environments that contribute to ecosystem services. The extent and functioning of these systems need to be determined to properly assess the potential impacts a development or activity can have on the water courses and downstream environments.
This report forms a desktop assessment based on existing biogeographical information systems, largely provided by SANBI and DWS. The report will be updated to include site findings on completion of site work, at which time a full impact assessment and management plan will be completed.

**Pollution of the Water Resources**: The most likely source of contaminants associated with the project is the possibility of sewage entering the wetland system, the spillage of petrochemicals and littering. A well-designed and maintained sewage system will negate this risk during the operational phase. During the construction phase, no sewage system will be in place and temporary ablution facilities are therefore a requirement.

**Loss of avifaunal habitat and loss of sensitive habitat:** Construction of residential houses is likely to take place and may potentially incur the loss of high or medium-highly sensitive habitat. Part of the study site coincides with watercourse and valley-bottom wetlands which provide habitat for threatened and near threatened bird species. It is possible construction and operational activities, especially noise and human-induced disturbances could displace birds from the area.

**Overall Sensitivity Analysis for the Study Site:** This ‘funnel-down approach’ in the consideration of the larger site focuses the detailed specialist studies in the EIA Phase to the portion of the site with reduced environmental sensitivities.

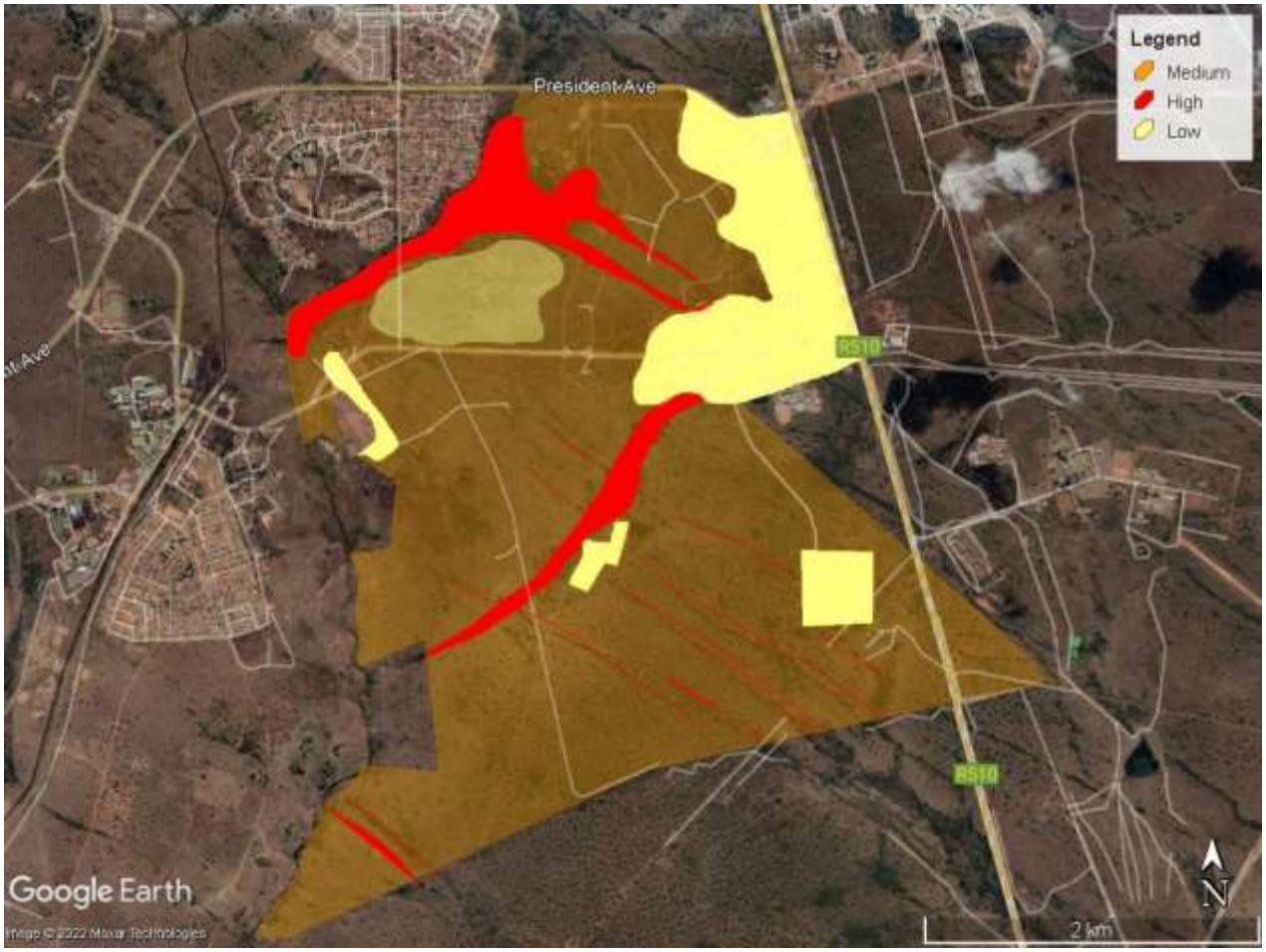


**Figure 2:** Possible sensitivity of the vegetation on the site.

In order to reduce the potential for on-site environmental impacts associated with the development, the identified sensitive areas in **Figure 2** should be avoided as far as reasonably possible. While observing these constraints to the available area for development, the extent of these demarcated areas far exceeds the required development and therefore it is possible to accommodate the SEZ development at the site with low impact on sensitive features. Within the highlighted focus areas, impacts on fauna (particularly) and flora would be relatively low and with mitigation, it is considered unlikely that the development would result in any highly significant ecological impacts. There are, however, some protected plant species present within these areas for which permits would be required to be obtained should these need to be disturbed.

The portion of the site which is proposed to be used for development, and particularly these areas if impacted, will be subject to survey and ground-truthing during the EIA phase of the project. The sensitivity map (**Figure 3**) outlines potentially sensitive areas identified through scoping within which more detailed investigation is required. These potentially sensitive areas will, therefore, be further investigated and assessed through detailed specialist studies (including field surveys) during the EIA phase of the process (refer to Chapter 10 for more details). The sensitivity map will be further refined in the EIA phase on the basis of these specialist studies, in order to inform the final design of the facility. In order to assess potential impacts within sensitive areas, the preliminary layout will be based on sensitivities identified in the scoping phase, and provided for consideration in the EIA phase.

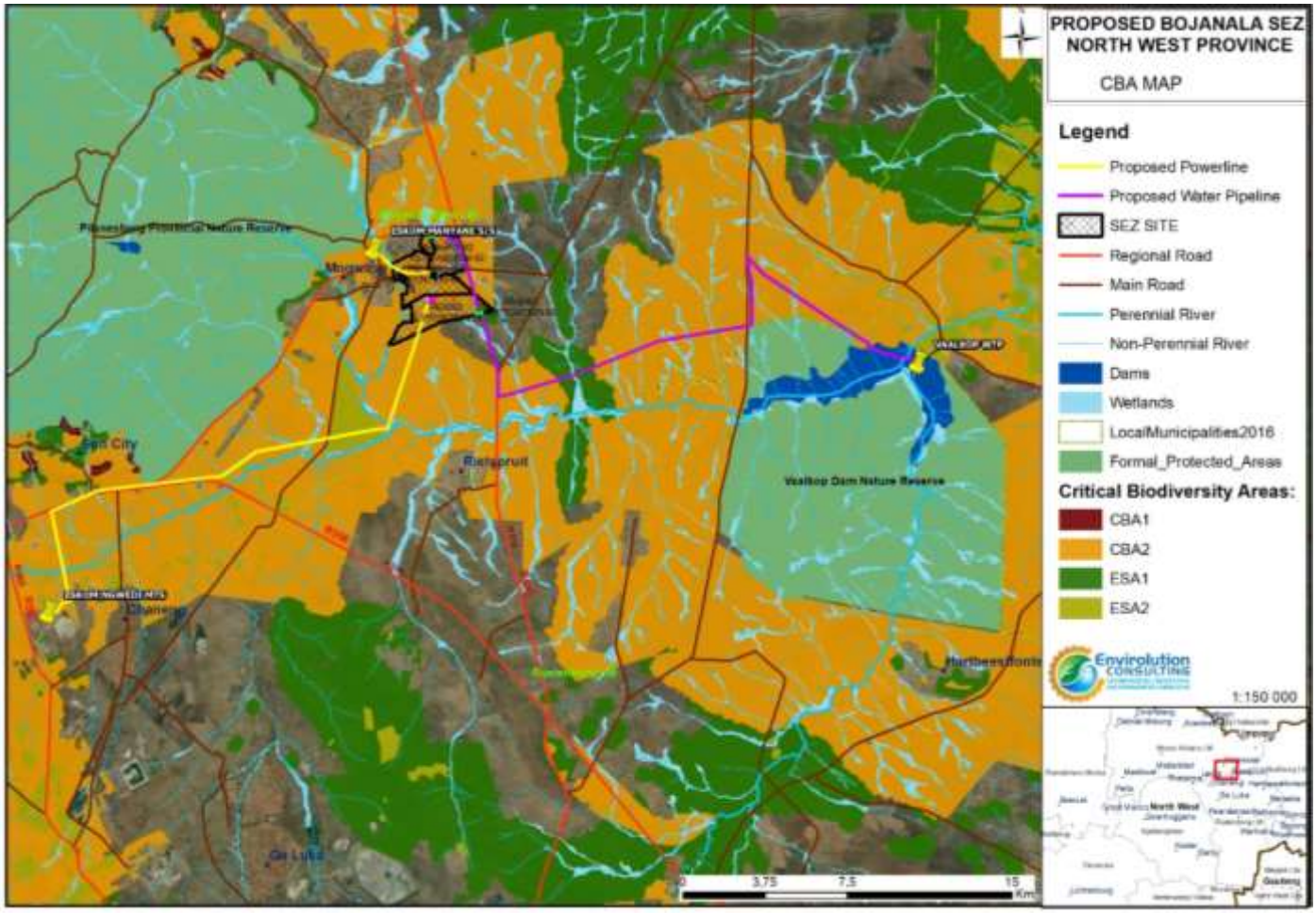


**Figure 3:** Desktop environmental sensitivity map of the proposed development site showing highly sensitive ecological areas

## 1.3 Requirement for an Environmental Impact Assessment Process

The construction and operation of the proposed the Bojanala Special Economic Zone (SEZ) is subject to the requirements of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA) 107 of 1998. This section provides a brief overview of the EIA Regulations and their application to this project. NEMA is the national legislation that provides for the authorisation of 'listed activities. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these activities must be considered, investigated, assessed and reported on to the competent authority that has been charged by NEMA with the responsibility of granting environmental authorisations.

The need to comply with the requirements of the EIA Regulations ensures that the competent authority is provided with the opportunity to consider the potential environmental impacts of a project early in the project development process and to assess if potential environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required in accordance with the EIA Regulations to provide the competent authority with sufficient information in order to make an informed decision. North West Development Corporation (NWDC) requires authorisation from the Department of Forestry, Fisheries

and the Environment - DFFE (as the competent authority) for the development of the Bojanala Special Economic Zone (SEZ). Reason being, North West Development Corporation (NWDC) "the applicant" is an entity of the North West DEDECT, accordingly DFFE has been identified Competent Authority to consider the application in accordance with **NEMA 24C (2) (d) (ii)which states**:

> *(2) The Minister must be identified as the competent authority in terms of subsection (1), unless otherwise agreed to in terms of section 24C (3), if the activity—*
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Infraconsult Engineering has appointed Envirolution Consulting (on behalf of NWDC) as the independent Environmental Assessment Practitioner (EAP) to conduct an EIA process for the proposed project.

The proposed Bojanala SEZ triggers a Full Scoping and EIA Process due to listed activities triggered from Listing Notice 1 (GN R. 327), 2 (GN R. 325) and 3 (GN R. 324). The proposed development requires a Full Scoping and EIA due to the following triggers:

| Government Notice | Activity Number | Activity Description | Relevance to this project |
|---|---|---|---|
| **GN R 325** | **15** | The **clearance of an area of 20 hectares** or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— | The proposed SEZ development will occur on an area of 1000 hectares of previously undeveloped land. |

*NB: This report is intended to motivate for an environmental authorisation with regards to the clearance of natural vegetation on the proposed site as well for the construction of bulk services i.e. construction of reservoirs, Bulk Sewerage Infrastructure, access roads, power lines, , waterpipe line and storm infrastructure.* ***It does not assess the potential impacts of each individual sector activity (as shown on the concept layout) as specific individual industrial and commercial activities or projects that will be on the SEZ will assess their specific technology alternatives during their individual environmental authorisation application processes.***

## 1.4 Objective of the EIA Phase

The scoping phase included desk-top studies and served to identify potential impacts associated with the proposed project and to define the extent of studies required within the EIA Phase. Input from the project proponent, specialists with experience in the study area and in EIAs for similar projects, as well as a public consultation process with key stakeholders, which included both government authorities and interested and affected parties (I&APs), was included in the evaluation of impacts.

The EIA Phase aimed to address those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with the project including design, construction, operation, and decommissioning, and recommend appropriate mitigation measures for potentially significant environmental

impacts. The purpose of this EIA report is to consider the impacts associated with the proposed powerline. This EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The release of a draft EIA for a 30-day period will provide stakeholders with an opportunity to verify that issues that they raised through the EIA Process have been captured and adequately considered. The final EIA Report for submission to the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL) will incorporate all issues and responses raised during the public review period of the draft report.

This EIA Report represents the findings of the EIA process and contains the following sections:

- **Chapter 1:** provides background to the proposed development and the environmental impact assessment process.
- **Chapter 2:** describes the components of the proposed project.
- **Chapter 3:** the need and desirability of the project
- **Chapter 4:** outlines the process which was followed during the Scoping Phase of the EIA process.
- **Chapter 5:** the description of the policy and legislative context within which the development is proposed
- **Chapter 6:** describes the existing biophysical and socio-economic environment affected by the proposed project.
- **Chapter 7:** description of issues and potential impacts
- **Chapter 8:** Identification of environmental issues and potential impacts
- **Chapter 9**: assessment of the potential environmental and social impacts associated with development phases of the proposed project.
- **Chapter 10:** presents the conclusions of the evaluation.

## 1.5 Environmental Impact Assessment Process

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

The EIA process comprises two phases as shown in **Figure 4** (i.e. Scoping and Impact Assessment) - and involves the identification and assessment of environmental impacts though specialist studies, as well as public participation.

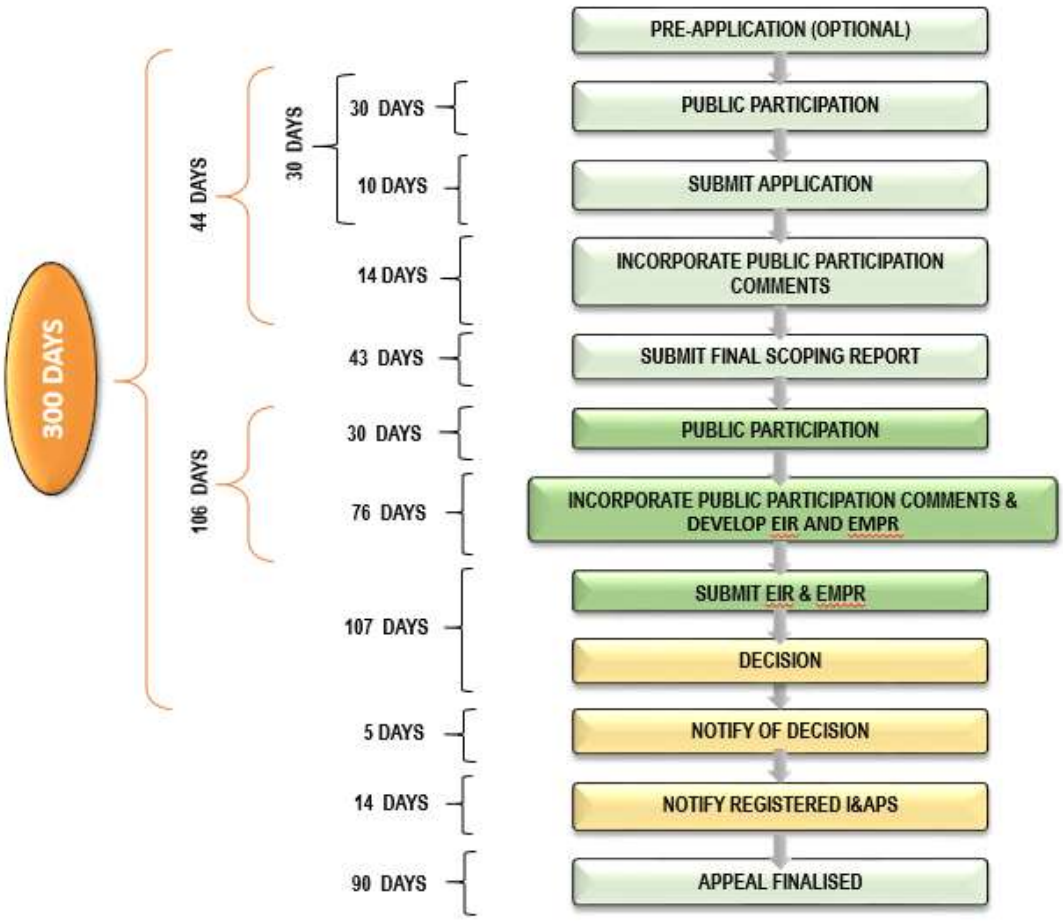



**Figure 4:** Full Scoping and EIA Process flow chart

The process followed in these two phases is as follows:

- The **Scoping Phase** includes the identification of potential issues associated with the proposed project through a desktop study and consultation with affected parties and key stakeholders. Areas of sensitivity within the broader site are identified and delineated in order to identify any environmental fatal flaws, and sensitive or no-go areas. Following a public review period of the draft report, this phase culminates in the submission of a Final Scoping Report and Plan of Study for EIA to the competent authority for acceptance.
- The **EIA Phase** involves a detailed assessment of potentially significant positive and negative impacts (direct, indirect, and cumulative) identified in the Scoping Phase. This phase includes detailed specialist investigations and public consultation. Following a public review period of the draft report, this phase culminates in the submission of a Final EIA Report and an Environmental Management Programme (EMPr), including recommendations of practical and achievable mitigation and management measures, to the competent authority for review and decision-making.

## 1.6 Details and Expertise of the Environmental Assessment Practitioner (EAP)

In terms of APPENDIX 3(3)(1) of the EIA Regulations 2017 (as amended), a Scoping Report must include -

**(a)** details of—

(i) the EAP who prepared the report; and

(ii) the expertise of the EAP to carry out scoping procedures; including a curriculum vitae

**(j)** an undertaking under oath or affirmation by the EAP in relation to—

i) the correctness of the information provided in the report;

ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and

any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

**(k)** an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;

Envirolution Consulting (Pty) Ltd was contracted by Infraconsult Engineering ( on behalf of North West Development Corporation as the independent environmental consultants to undertake the Environmental Impact Assessment (EIA) Process for the proposed project. Envirolution is not a subsidiary or affiliated with neither Infraconsult Engineering nor North West Development Corporation. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

As required by NEMA, the qualifications and experience of the key independent Environmental Assessment Practitioners (EAPs) undertaking the EIA is detailed below and Curriculum Vitae provided in **Appendix G1**.

- **Sheila Bolingo,** the principle author of this Report holds an Msc degree in Environmental Management with 10 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- **Gesan Govender** is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 17 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Curricula vitae for the project team consultants an undertaking under oath or affirmation by the EAP are included in **Appendix G1.**

**Other team members include (External Specialists):**

In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialists to conduct specialist impact assessments:

- Agricultural Potential – Joshua Oluokun of Environet Consulting
- Terrestrial Ecological – Antoinette Eyssell of Dimella EcoConsulting
- Aquatic and wetland Impact Assessment – Antoinette Bootsman of Limosella Consulting
- Fauna Assessment - Barbara Kasl
- Heritage - Johan van Schalkwyk of Johan Heritage Consultant
- Palaeontology - Heidi Fourie
- Visual Assessment - Mader van den Berg of Skets Architects, Planning & Environmental Consulting cc.
- Social Assessment - Amina Ismail

## 1.7 Assumptions and Limitations

This SR is based on currently available information and, as a result, the following limitations and assumptions are implicit:

- This report fulfils the requirement of the EIA Regulations 2017 (as amended), for the documentation of the EIR phase. The structure of this report is based on Appendix 3 of GNR No. 326, of the EIA Regulations (2017) (as amended 2017), which clearly specifies the required content of an Environmental Impact Assessment Report.
- This report is intended to motivate for an environmental authorisation with regards to the clearance of natural vegetation on the proposed site as well for the construction of bulk services i.e. of access roads, power lines, construction of reservoirs, water, sewer and storm water pipelines. **It does not assess the potential impacts of each individual sector activity (as shown on the concept layout) as specific individual industrial and commercial activities or projects that will be on the SEZ will assess their specific technology alternatives during their individual environmental authorisation application processes.**
- The report is based on project information provided by the client.
- Descriptions of the natural and social environments are based on limited fieldwork, relevant specialist studies and available literature.

# 2 PROJECT DESCRIPTION

In terms of APPENDIX 3(3)(1) of the EIA Regulations (2014)(as amended 2017), an Environmental Impact Assessment Report must include –

**b) The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, 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 terms of (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 the associated structures and infrastructure and 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;
(ii) On land where the property has

**d) A description of the scope of the proposed activity, including –**

(i) All listed and specified activities triggered and being applied for;
(ii) A description of the associated structures and infrastructure related to thedevelopment.

## 2.1 Property Description

The SEZ falls under the jurisdiction of the Moses Kotane Local Municipality of the Bojanala Platinum District Municipality. It is located in the eastern part of Mogwase to the south-east of the residential township Mogwase Unit 5, south of President Street and west of Road R510. The Bodirelo industrial township forms the northern boundary of the proposed SEZ **(See Figure 5**).

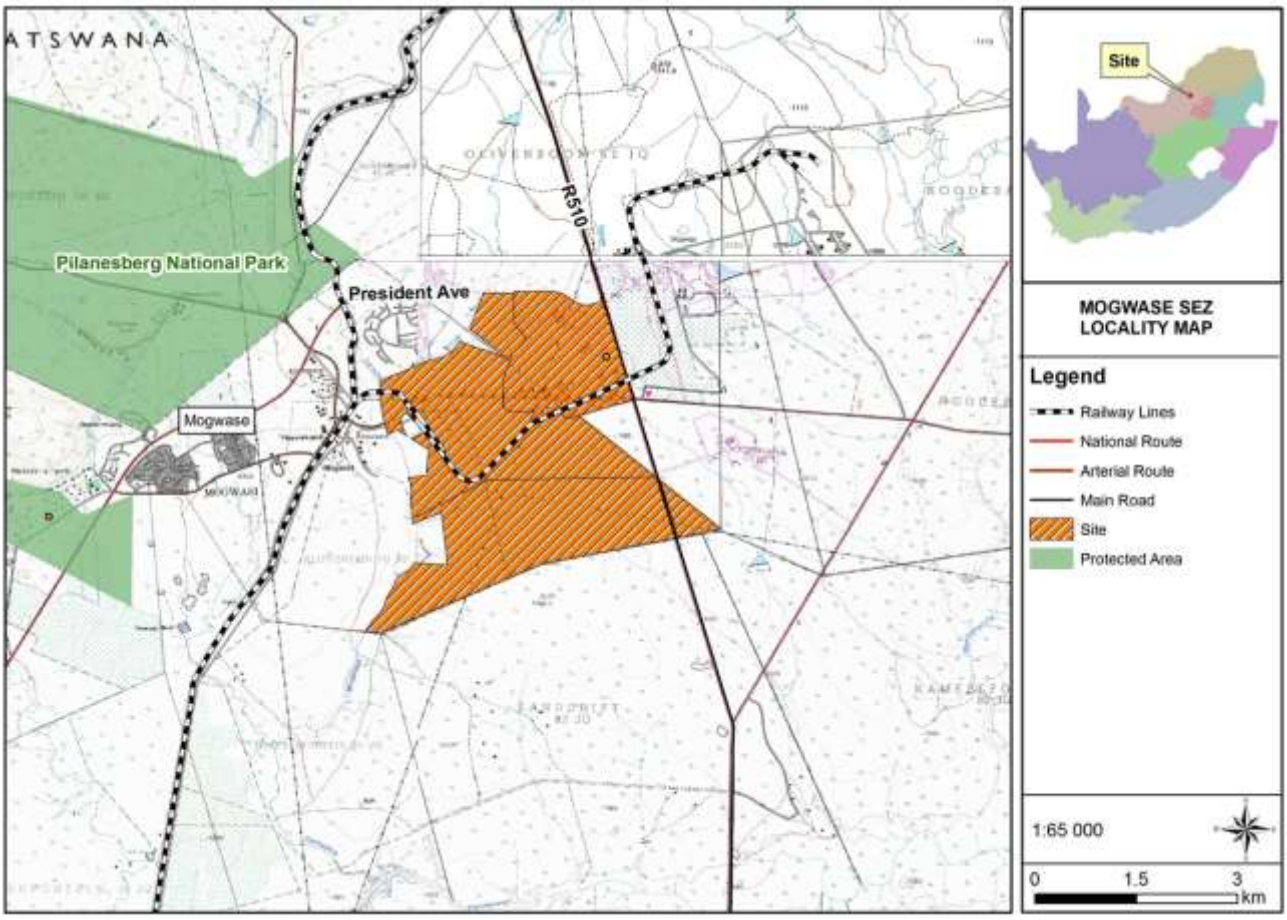



**Figure 5:** Locality of the proposed SEZ.

The details for the properties that make up the SEZ and the associated Bulk Services are as follows, the affected properties & owners are graphically represented on **Figure 6.**

**Affected Land Parcels for SEZ**

| | |
|---|---|
| **Coordinates (centre)** | Lat: 25°16'38.05"S; Long: 27°15'39.48"E |
| **Local Municipality & District** | Moses Kotane Local Municipality of Bojanala Platinum District Municipality. |
| **Ward Number(s)** | Ward 33 |
| **Farm Name & Portion number** | • The proclaimed Bodirelo Industrial Township of which approximately 50% is already developed and is located on **Portion 7 of the farm Olivenboom 62**-JQ and is 160 ha in size.<br>• In addition to the Bodirelo Industrial Township, 3 additional land portions which are located to the west and south of Bodirelo also form part of the SEZ. These land parcels are:<br>o The **Remainder of Portion 2 of the farm Olivenboom 62- JQ** which is 53 ha in size.<br>o The **Remainder of Portion 1 of the farm Klipfontein 60- JQ** which is 433 ha.<br>o **Portion 6 of the farm Klipfontein 60-JQ** which is 471, 4495 ha in size (A portion of Portion 6 of the farm Klipfontein 60-JQ |

| | |
|---|---|
| | falls on the eastern side of Road R510.) |
| **SG Codes** | T0JQ000000000062000007<br>T0JQ000000000062000002<br>T0JQ000000000060000001<br>T0JQ000000000060000006 |
| **Zoning** | The land outside the proclaimed Bodirelo industrial township, which is primarily zoned for Industrial 1 purposes, is zoned for Agricultural purposes in terms of the Moses Kotane Town Planning Scheme, 2005 |

**Overhead Powerline**

| | |
|---|---|
| **Coordinates** | • **Start** (Ngwedi SS): 25°24'38.76"S; 27° 5'15.45"E<br>• **Middle** (near Sun City): 25°21'32.28"S; 27° 7'8.15"E<br>• **End** (SEZ SS south): 25°16'54.96"S; 27°15'45.09"E |
| **Local Municipality & District** | Moses Kotane & Rustenburg Local Municipality of Bojanala Platinum District Municipality. |
| **Ward Number(s)** | • 33, 13,28 of Moses Kotane Local Municipality<br>• 1 & 2 of Rustenburg Local Municipality: |

| Farm Name | Portion # | SG Codes |
|---|---|---|
| Zanddrift 82 | RE | T0JQ000000000008200000 |
| Zanddrift 82 | 2 | T0JQ000000000008200002 |
| Buffelsfontein 85 | RE | T0JQ000000000008500000 |
| Rhenosterfontein 86 | RE | T0JQ000000000008600000 |
| Rhenosterfontein 86 | 3 | T0JQ000000000008600003 |
| Rhenosterfontein 86 | RE/7 | T0JQ000000000008600007 |
| Rhenosterfontein 86 | 8 | T0JQ000000000008600008 |
| Waagfontein 89 | 4 | T0JQ000000000008900004 |
| Styldrift 90 | RE | T0JQ000000000009000000 |
| Frischgewaagd 96 | RE/10 | T0JQ000000000009600010 |
| Frischgewaagd 96 | 11 | T0JQ000000000009600011 |
| Frischgewaagd 96 | 14 | T0JQ000000000009600014 |
| Frischgewaagd 96 | 17 | T0JQ000000000009600017 |

**Water Pipeline**

| | |
|---|---|
| **Size** | 28km of 200mm Dia |
| **Coordinates** | **Start** (Vaalkop WTP): 25°18'35.16"S; 27°28'55.87"E<br>**End** (New storage pump South): 25°17'14.42"S; 27°17'0.96"E to the New storage pump North: 25°15'19.26"S; 27°15'43.47"E. |
| **District & Local Municipality** | Moses Kotane, Rustenburg & Madibeng Local Municipality of Bojanala Platinum District Municipality. |
| **Ward Number(s)** | • 33 & 10 of Moses Kotane Local Municipality<br>• 28 of Rustenburg Local Municipality<br>• 1 of Madibeng Local Municipality |

| Farm Name | Portion # | SG Codes |
|---|---|---|
| Bulhoek 75 | RE/17 | T0JQ00000000007500017 |
| Bulhoek 75 | 19 | T0JQ00000000007500019 |
| Bulhoek 75 | 26 | T0JQ00000000007500026 |
| Bulhoek 75 | 31 | T0JQ00000000007500031 |
| Kameelfontein 80 | RE | T0JQ00000000008000000 |
| Zanddrift 82 | RE | T0JQ00000000008200000 |
| Vaalkop 118 | 0 | T0JQ00000000011800000 |
| Farm 927 | 0 | T0JQ00000000092700000 |

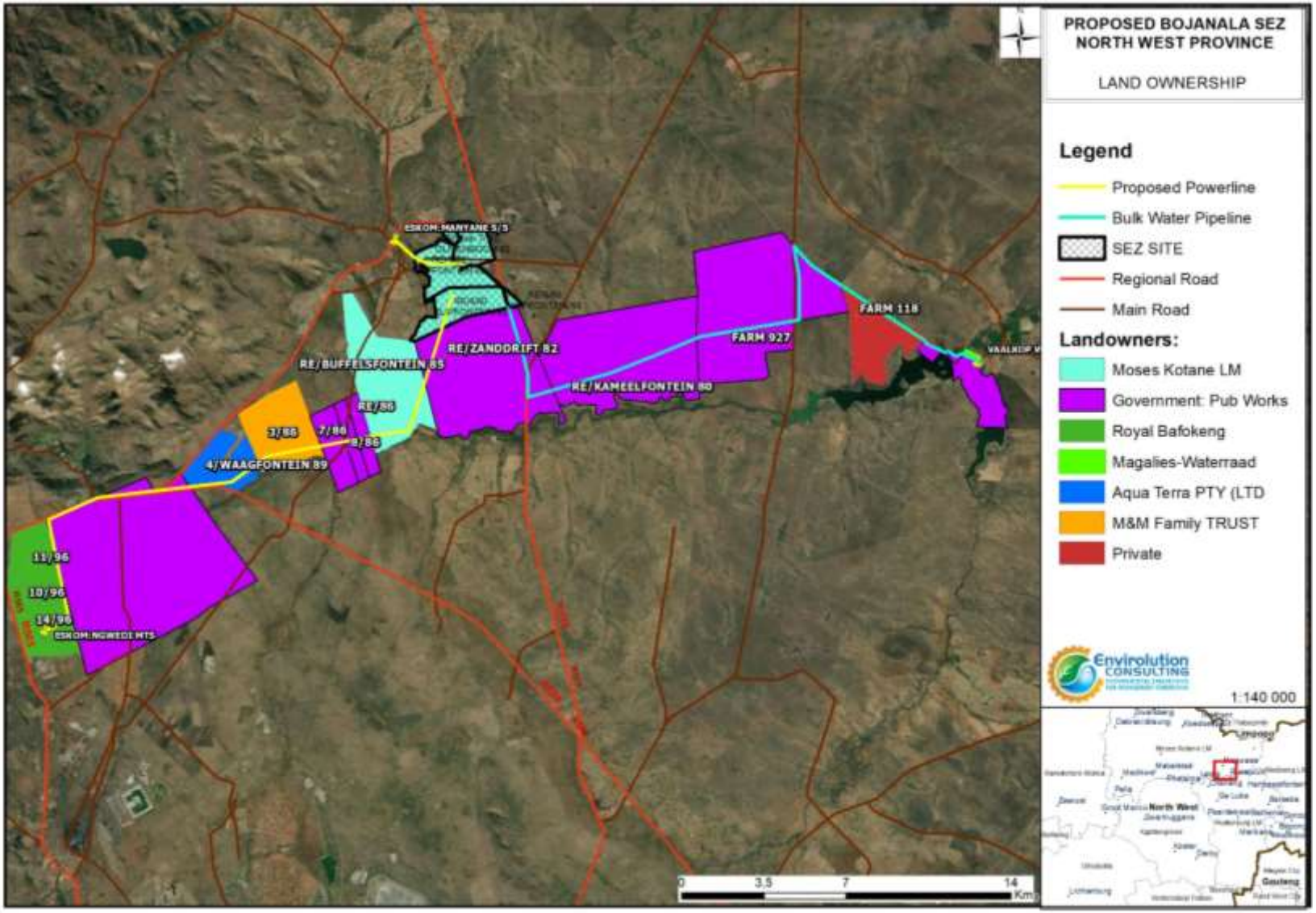



**Figure 6:** Affected Land Parcels for the SEZ & Bulk Services

## 2.2 Description of Proposed Activity

### 2.2.1 Zones of development

The concept layout plan for the SEZ as shown in **Figure 7** makes provision for 926 Industrial erven with a ruling size of 5000m². Different zones for the following Industrial sectors are shown on the concept plan.

- Zone A which is the undeveloped part of the Bodirelo township and will be reserved for renewable energy
- Zone B which is that part of the SEZ reserved for the production of mining machinery
- Zone C which has been reserved for mineral beneficiation
- Zone D which will be used for Agro processing
- Zone E: A rail/port site for a logistics hub is proposed on the western side of the concept layout plan closest to Mankwe station. It is the intention to extend the railway line from Mankwe station to the site.
- Zone F: two mixed-use areas are proposed along the northern boundary of the SEZ and at the south-eastern corner of the SEZ. The mixed-use zone on the south-eastern corner is earmarked for a truck stop, kiosk and restrooms.
- Zone G: Area reserved for Service infrastructure, within the SEZ a water treatment plant and a waste processing plant had been provided. Various servitudes to protect power lines, have also been accommodated on the concept plan. Water courses that run through the area have been shown as open space.

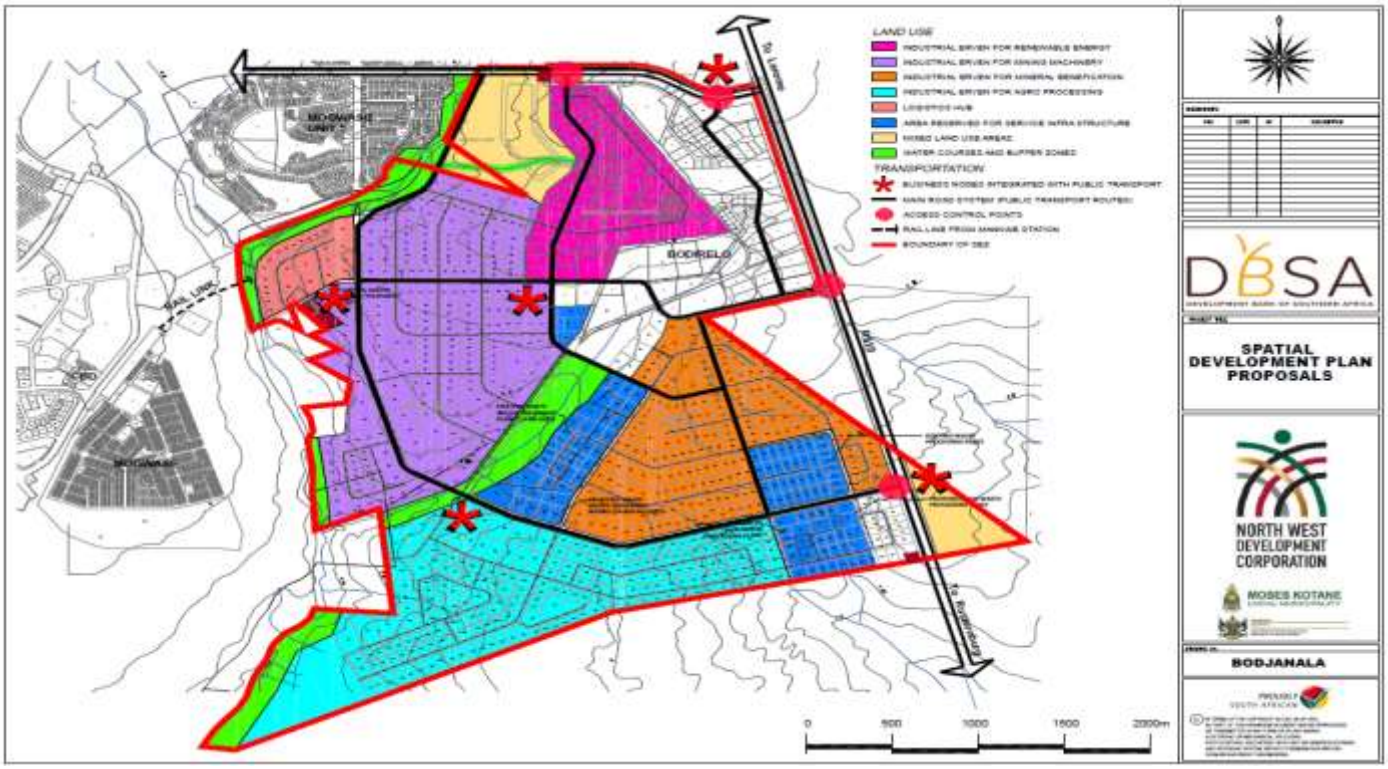



**Figure 7:** Concept Layout Plan showing different zones of the development of the Mogwase SEZ

### 2.2.2 **Provision of bulk services**

Currently, there are no bulk services in place within the proposed SEZ, the following bulk services will be constructed:

- Bulk Sewerage Infrastructure
- Bulk Water Infrastructure
- Electrical infrastructure
- Stormwater Management
- Road Master Plan
- Solid Waste Disposal

**Bulk Sewage infrastructure**

The existing Bodirelo Industrial Area is serviced with waterborne sewerage systems, while the Mogwase Residential Township areas are served via a combination of (i) waterborne sewerage systems and (ii) septic tank / French drain systems. The Mogwase Waste Water Treatment Works (WWTW) serves the Bodirelo Industrial Area and the Mogwase Residential Areas. This WWTW has a design capacity of 4 Mℓ/ day. According to Moses Kotane Local Municipality, there are currently extreme challenges experienced in the Bodirelo area and according to Moses Kotane Local Municipality Infrastructure Department, there are currently no plans for upgrading of above WWTW.

Based on the huge challenges faced with the existing sewer and Waste Water Treatment Capacity, it is recommended that:

- The existing Mogwase Waste Water Treatment facility be upgraded from 4Mℓ / day to 30Mℓ / day capacity to accommodate the future SEZ Development and future proposed Developments (see **Figure 8**)
- The upgrading be implemented in a phased manner allowing for 5Mℓ capacity upgrades within every 2 to 3 years depending on the growth and development of the SEZ.

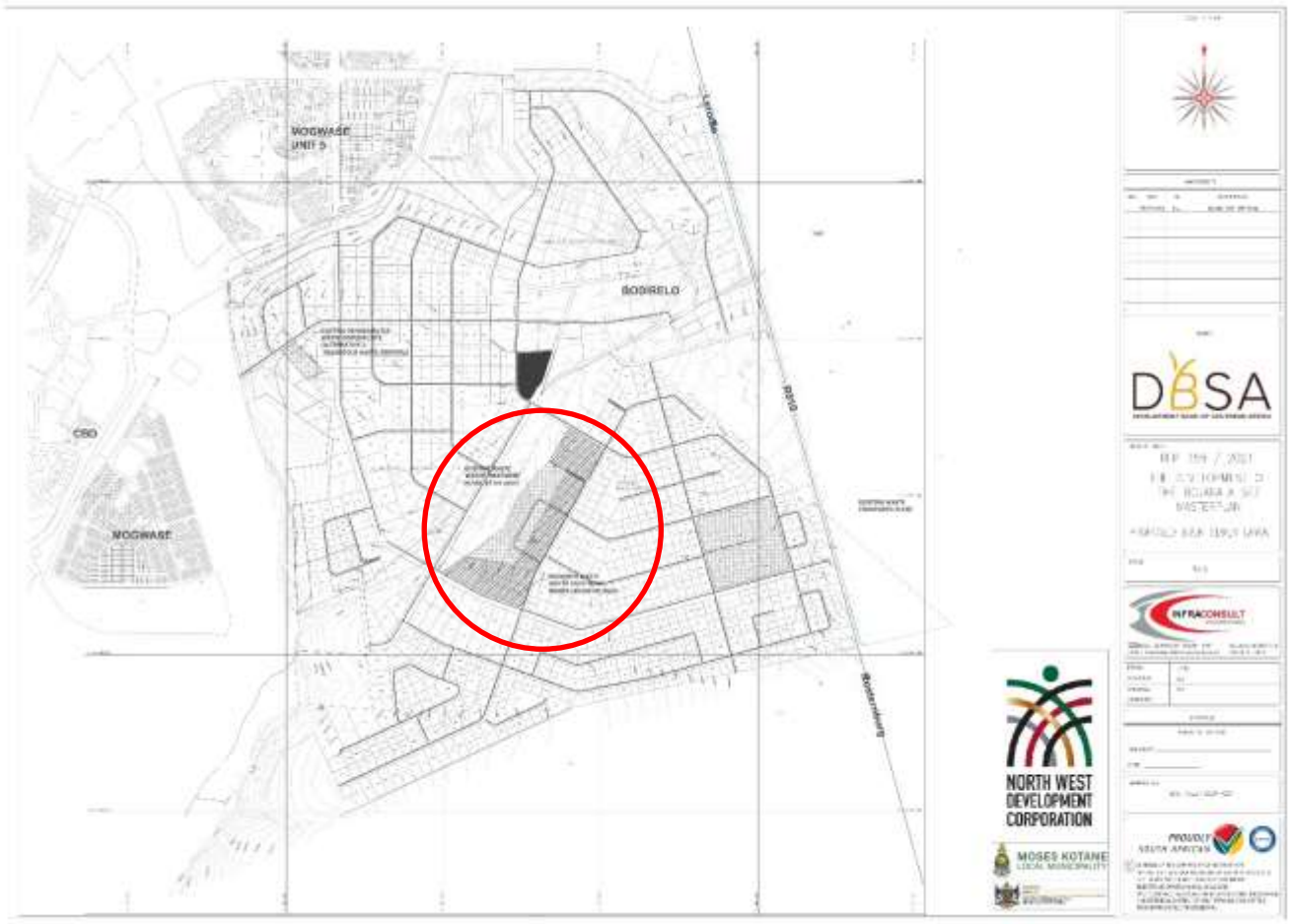



**Figure 8:** Proposed Bulk Sewage infrastructure expansions

**Bulk Water Infrastructure**

According to our engagement with Moses Kotane Local Municipality Department, the Status Quo on the proposed construction of a new 10Mℓ / day storage reservoir and storage augmentation for Mogwase Township was completed by Moses Kotane Local Municipality and connected from Magalies Water. This will see challenges of water shortages in Mogwase being addressed. However, this will not be sufficient to supply the expected future Bojanala SEZ a **Water Demand** (Annual Average Daily Demand) Calculations, according to the Town Planners Report, allow for 5000 m² /erf. The estimated size of the SEZ is +/- 1137 Ha.

Based on the Water Supply challenges as pointed out by both Moses Kotane Local Municipality (MKLM) and Magalies Water and based on the Bulk Water Demand Calculations for SEZ, the following is recommended as shown in **Figure 9**:

- Upgrading of existing ± 28km of Bulk 200mm Dia Supply line from Vaalkop Water Treatment Works to Bodirello Industrial Area.
- Provision of 3Mℓ Elevated Storage Tank with pumpstation at eastern side of SEZ (25°17'14.42"S; 27°17'0.96"E)
- Provision of 4.5Mℓ Elevated Storage Tank with pumpstation at western side of SEZ (25°15'19.26"S; 27°15'43.47”E).

- New Bulk Supply line (160mm Dia) between eastern and western storage tanks (± 631.615m)


**Figure 9:** Proposed Bulk Water Infrastructure

### Electrical infrastructure

Based on previous information, there is currently no spare capacity on the existing Eskom network in the area. Eskom was engaged to determine the current status quo of the current electrical network. Eskom, neither confirmed nor denied there being any capacity availability in the area. Eskom requested that an application be submitted to enable Eskom to perform the necessary studies.

According to information at hand, the Ngwedi MTS was constructed to transfer power from the Medupi power station to the area. We are therefore, confident that capacity will be available; however, the timeline to make this capacity available is unknown at the time of writing this report. Network strengthening projects in Eskom have a very long lead time and can be more than 60 months.

**ESKOM Network Planning**

- Design Load As the exact electrical demand of the possible tenants is unknown at the time of writing this report, the anticipated electrical load of SEZ is shown in **Figure 10.** The electrical design loads were re-calculated based on the Conceptual Township Layout.

| Description | Design Load |
|---|---|
| Renewable Energy (Area A) | 20.329 MVA |
| Mining Machinery (Area B) | 50.837 MVA |
| Mineral Benefication (Area C) | 64.070 MVA |
| Agro Processing (Area D) | 49.813 MVA |
| Rail / Port Site (Area E) | 1.872 MVA |
| Mixed Use (Area F) | 2.040 MVA |
| Mixed Use (Area G) | 6.640 MVA |
| Existing Industrial Park | 11.225 MVA |
| **Total** | **206.826 MVA** |

**Figure 10:** Total Development Design Load

- Two new 132 / 22 kV substations are proposed (**Figure 11**);
    - SEZ North S/S Area of Supply: The Mixed Use (Area G), Renewable Energy (Area A) and Mining Machinery (Area B); 25°16'17.82"S; 27°15'47.58"E
    - SEZ South S/S Area of Supply: Mineral Beneficiation (Area C), Agro-Processing (Area D) and Mixed Use (Area F); 25°16'54.96"S; 27°15'45.09"E
- Construct eight (8) 22 kV switching stations to distribute the electricity from the substation to the stands.
- Construct new 30 km, 132 kV overhead line from the Eskom Ngwedi MTS to SEZ 132/22 kV substations (**Figure 12);**
- Renewable Energy: Irrespective of renewable energy implemented at the SEZ, it will be a requirement that the bulk infrastructure constructed should be able to support the anticipated design load. It is to be noted that for the SEZ to derive the maximum benefit from renewable energy sources, it should ideally be an electricity reseller. When the renewable energy sources are connected to the Eskom grid, the SEZ will derive a no cost-benefit.

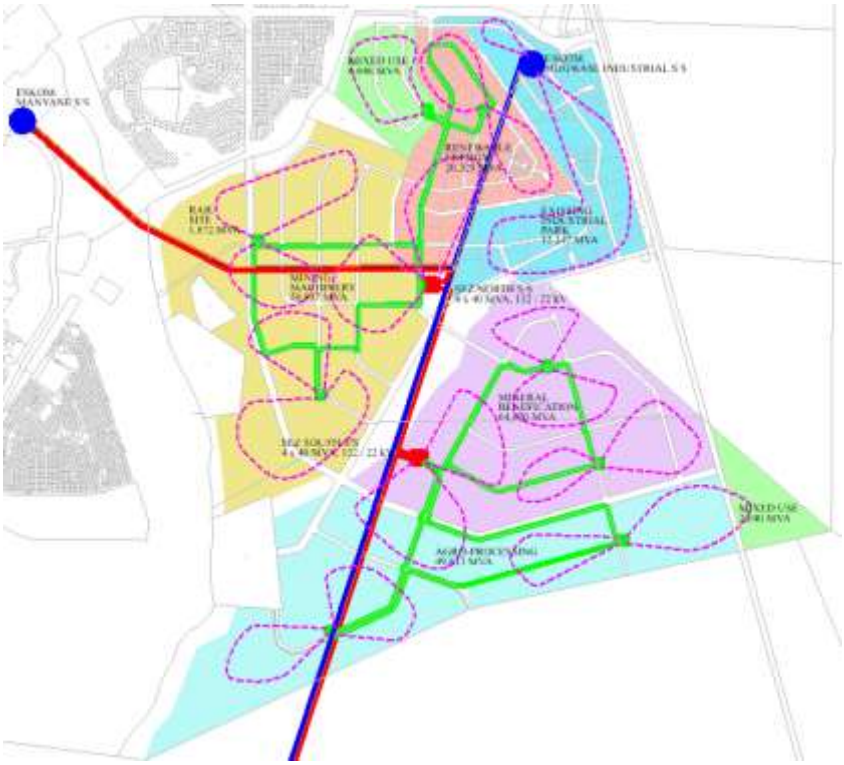


**Figure 11:** Two new 132 / 22 kV substations are proposed

**Figure 12:** Proposed 132 kV overhead line (red line)

**Stormwater Management**

In general, stormwater to be mainly accommodated within the road surfaces, underground piped systems and within road reserves and discharged onto lower lying green areas along existing stream. Minor storm (1:5) to be catered for within underground piped systems where kerb-overtopping occurs; Major storm (1:20) to be attenuated and discharged into existing Mogwase stream (shown in green in **Figure 13**). We found an existing piped stormwater network available within parts of the Industrial Area.

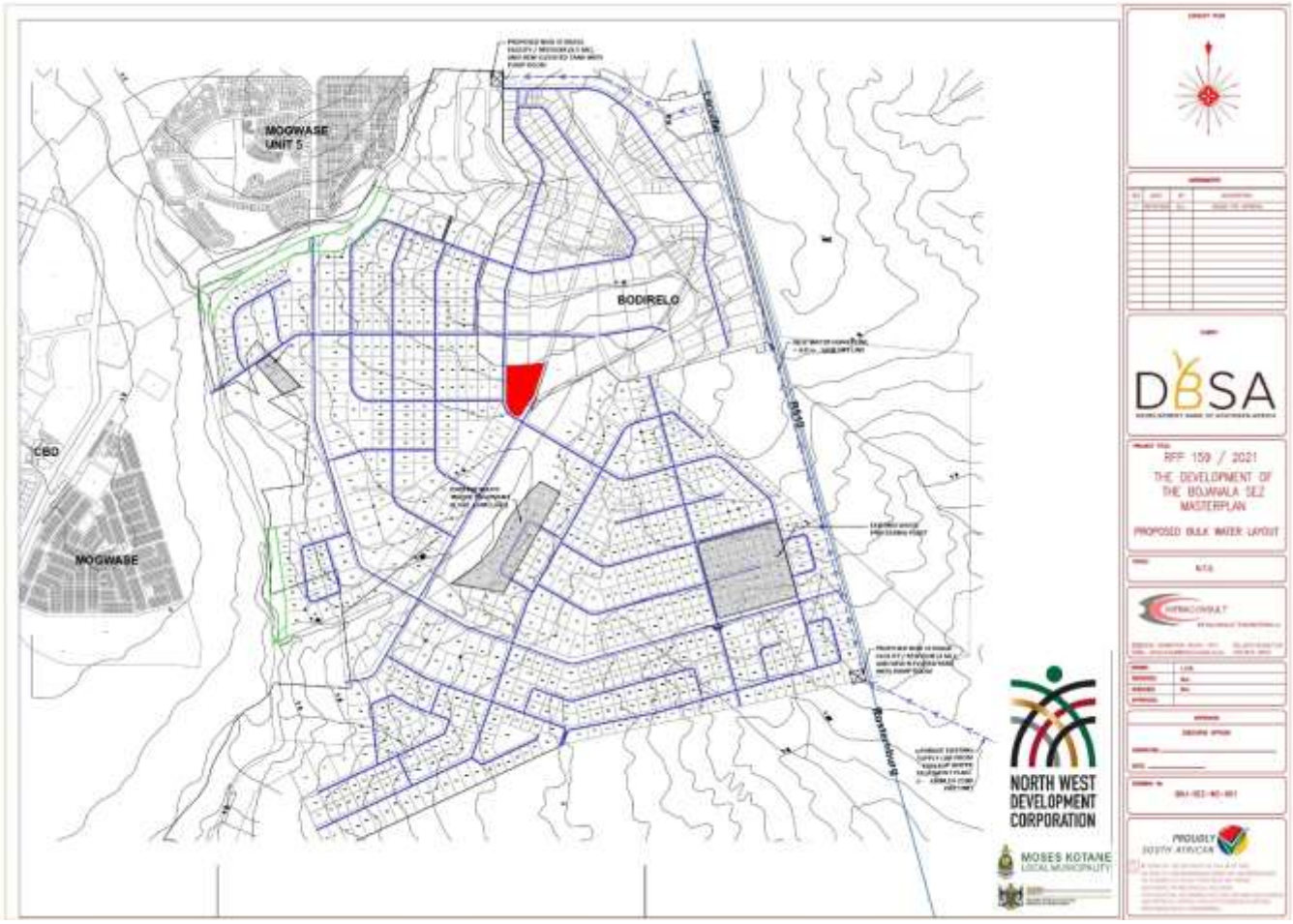



**Figure 13:** Stormwater Management

### Road Master Plan

- Existing Local Roads Network: To the North of this proposed development is Road P53-1(President Ave), the East side is the R510 and to the south is the unnamed road running east to Ga-Ramokoka and west to the Industrial Site. Road P53-1(President Ave) is in a poor condition. The entire length of road between the R556 and the SEZ (19,1km) needs to be upgraded by the NWP. This route will also carry the proposed future cargo from the Pilanesburg Airport to/from the SEZ and local public transport (**Figure 14**)


**Figure 14:** Proposed SEZ Surrounding Roads (President Avenue Road (blue) and R510 Road (green)

The **rail report** obtained concludes that the Province continues engagement with PRASA regarding future developments of Freight Rail Services. A potential freight rail siding will be shown for consideration, if warranted. Passenger Rail services are unlikely to play a significant future role. Potential SEZ Rail Extension for area (**Figure 15**), There is already a rail reserve put aside for the siding.


**Figure 15:** Rail Infrastructure Upgrades

- Regional Locality/ Road Network: The Special Economic Zone (SEZ) is connected by several roads network from the south along the National 4 (N4) there is a connection with the R104 traversing the Rustenburg CBD then connecting to the west on the R565 right into the R556 and left onto President Avenue outside the Pilanesberg International Airport. The second connection from the Rustenburg CBD along the R104 is the R510 Road north of the centre of the business district, running north/ south to the SEZ proposed development area with connection to the SEZ off the R510 Rd. Gauteng Province is connected along the N4

onto the R556 Rd north with two opportunities off the R556 Rd onto President Ave or off the R556 Rd turns right onto the R510 Rd north. From the Limpopo Province north of the Special Economic Zone, the R510 Rd is the direct connection to the proposed site development running north/ south.

- Proposed Upgrades: The Current Intersections off the R510 to the Bodirelo Industrial Park should be extended to serve as access roads to the SEZ new development, A new intersection is proposed along the R510 to serve the southern part of the new development; these interception are shown in **Figure 16** and can be descried as follows:
    - Int 1 Proposed upgrade to President Ave SEZ and Mixed-Use development access;
    - Int 2 Proposed upgrade to President Ave Bodirelo Industrial area north;
    - Int 3 Proposed upgrade to President Ave/R510 intersection
    - Int 4 Proposed upgrade to Bodirelo Industrial area/R510 intersection; and
    - Int 5 Proposed New South Industrial Access & truck stop to R510

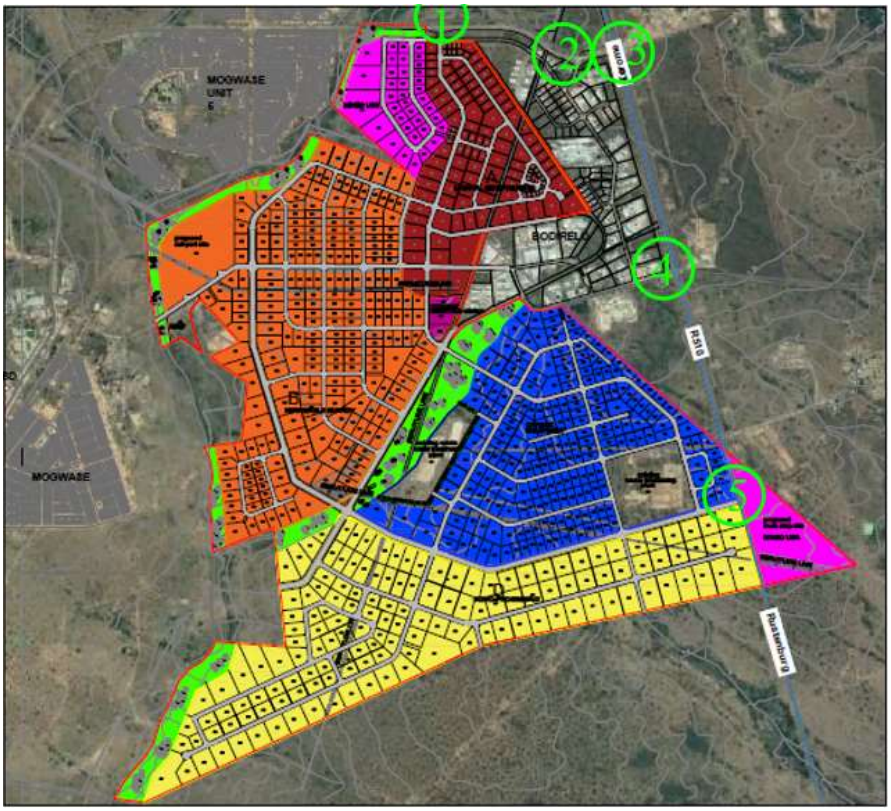



**Figure 16:** Proposed SEZ Road Layout for Master Plan

**Solid Waste Disposal**

According to Moses Kotane Local Municipality there are currently two Waste Disposal Sites serving the greater Moses Kotane Local Municipality Area; these are for Domestic Waste only and not suitable for Industrial Waste. It was pointed out that there is a rehabilitated landfill site located in Phase C of the proposed SEZ Industrial Area; It is recommended that this landfill site be used for Industrial Waste purposes. Other alternative sites to be visited with Bojanala District Municipality. Further consultation to be held with Moses Kotane Local Municipality (MKLM) and Bojanala District Municipality to finalize these arrangements and specific technology alternatives will be assessed during their individual environmental authorisation application processes.

### 2.2.3 **Summary of technical details for the proposed facility**

In summary, the **3 major components** to be built are as follows:

1. The **SEZ Development Zones** with the following infrastructures within its footprint –
   - 2x Proposed 132/22 kV Substations – North & South
   - 3km 132 kV Overhead Powerline (from the Proposed 132/22 kV Substation to the existing Manyane Substation located North West of the SEZ).
   - Proposed water Pipe (160mm)
   - 2 New storage pumps (elevated)
   - WWTP Expansion (Adjacent to Existing WWTP)
   - Attenuation Dams
2. **Proposed** SEZ **132kV Powerline** – From SEZ to Ngewdi Substation
3. Upgrading of existing **Bulk Water line** from Vaalkop Water Treatment Works to Bodirello Industrial Area

The following table summarises the technical details for the proposed facility.

**Table 1:** technical details for the proposed facility

| **Component** | Description / dimensions |
|---|---|
| SEZ | 1117 ha |
| Electrical infrastructure | 30km of 132kV (100m corridor) |
| Water infrastructure | 28km of 200mm Dia |
| Stormwater infrastructure (Attenuation dams) | ± 3.7 Ha |
| WWTP | • Existing: ± 14.2 Ha<br>• Proposed expansion: ± 25 Ha |

## 2.3 Listed activities triggered

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GNR 324, 325, 326 and 327 (07 April 2017) Government Gazette 40772, an EIA is required for the proposed project. **Table 3** contains the listed activities in terms of the EIA Regulations (as amended) and includes a description of those project activities which relate to the applicable listed activities.

**Table 2:** Listed Activities Applicable applied for to be authorise

| Activity No(s): | Provide the relevant **Scoping & EIA Activity(ies)** as set out in GNR R.327 **Listing Notice 1** of the EIA Regulations 2017 (as amended) | Describe the portion of the proposed project to which the applicable listed activity relates. |
|---|---|---|
| **9** | The development of **infrastructure exceeding 1 000 metres in length for the bulk transportation** of water or storm water—<br><br>(ii) with a peak throughput of 120 litres per second or more; | Upgrading of existing ± 28km of Bulk 200m diameter Supply line from Vaalkop Water Treatment Works to Bodirello Industrial Area with a peak throughput of more than 120 litres per second |
| **11** | Development of facilities or **infrastructure for the transmission and distribution** of electricity<br>(i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts | The proposed power line for in support of the development will be constructed outside the urban area and will transmit electricity of up to 132kV. |
| **12** | The **development of**<br>**(ii) infrastructure** or structures with a physical footprint of 100 square meters or more where such development occurs, —<br>(a) Within a watercourse; | A low-level crossing or culvert of more than 100 m² will be constructed within the watercourse for access roads. Power line pylons to be located within 32m of a watercourse. |
| **13** | The **development** of facilities or infrastructure for the off-stream storage of water, including dams and **reservoirs**, with a combined capacity of 50 000 cubic metres or more, | Provision of 3Mℓ Elevated Storage Tank (reservoirs) with pump station at eastern side of SEZ. & provision of 4.5Mℓ Elevated Storage Tank with pump station at western side of SEZ i.e. combined capacity of 75 000 cubic metres. |
| **19** | The **infilling or depositing of any material** of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse | The proposed SEZ development requires the construction of infrastructure (access roads) within existing drainage system which runs through the proposed site. |
| **28** | **Residential, mixed, retail, commercial,** industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:<br><br>(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or | The propose SEZ entails the development of residential, mixed, retail, commercial, industrial or institutional developments land was used for agriculture, where the total land to be developed is bigger than 5 hectares; |
| **34** | The **expansion of existing facilities or infrastructure** for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, | The SEZ require the upgrading of existing 5Mℓ/day sewer treatment work to 30Mℓ / day (30 000 cubic metres) resulting in an increased development footprint of over 1 000 square meters for the existing sewer treatment works. This expansion will result in the amendment of the current waste licence |
| **57** | The expansion and related operation of facilities or infrastructure for the **treatment of effluent, wastewater or sewage** where the capacity will be increased by 15 000 | The SEZ require the upgrading of existing 5Mℓ/day sewer treatment work to 30Mℓ / day (30 000 cubic metres) resulting in an increased development footprint of over 1 000 square |

| | | |
|---|---|---|
| | cubic metres or more per day and the development footprint will increase by 1 000 square meters or more. | meters for the existing sewer treatment works |
| Activity No(s): | Provide the relevant **Scoping and EIR Activity(ies)** as set out in **Listing Notice 2** of the EIA Regulations 2017 (as amended). | Describe the portion of the proposed project to which the applicable listed activity relates. |
| **15** | The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—<br>(i) the undertaking of a linear activity; or<br>(ii) maintenance purposes undertaken in accordance with a maintenance management plan. | The proposed SEZ development will be developed on an area of 1000 hectares of previously undeveloped land. |
| Activity No(s): | Provide the relevant **Scoping & EIA Activity(ies)** as set out in GNR R.324: **Listing Notice 3** of the EIA Regulations 2017 (as amended). | Describe the portion of the proposed project to which the applicable listed activity relates. |
| 4 | The **development of a road** wider than 4 metres with a reserve less than 13,5 metres.<br><br>**h.** North West<br><br>**iv.** Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;<br>**vi.** Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve | A portion of a road wider than 4 metres with a reserve less than 13,5 metres will be constructed within Critical Biodiversity Areas /Ecological Support Areas identified in the provincial Conservation Plan as well as located within 5 kilometres from any other protected area identified in terms of NEMPAA (Pilanesberg Game Reserve) |
| 12 | The clearance of an area of 300 square metres or more of indigenous vegetation<br><br>**h.** North West<br><br>**iv.** Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;<br>**vi**. Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland. | The project is proposed within the Critical Biodiversity Areas /Ecological Support Areas identified in the provincial Conservation Plan as well as located within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland. |
| 14 | The development of—<br>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—<br><br>(a) within a watercourse<br><br>h. North West<br><br>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority;<br>vi. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve | A portion of the project is proposed within Critical Biodiversity Areas /Ecological Support Areas identified in the provincial Conservation Plan as well as located within 5 kilometres from any other protected area identified in terms of NEMPAA (Pilanesberg Game Reserve) |

*NB: This assessment focuses on the land clearance and construction of bulk services, the specific individual industrial and commercial activities or projects that will be on the SEZ will assess their specific technology alternatives during their individual environmental authorisation application processes.*

# 3 THE NEED AND DESIRABILITY OF THE PROJECT

In terms of APPENDIX 3(3)(1) of the EIA Regulations 2017 (as amended), an Environmental Impact Assessment Report must include –

**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 development footprint within the approved site as contemplated in the accepted scoping report**.

The promoters of Bojanala Valley vision the establishment of the proposed Bojanala SEZ in North West Province as a catalytic role towards the economic revival and development of the whole Bojanala region. Since, SEZs are expected to contribute towards strengthening South Africa's terms of trade through the export of value-added commodities, the creation of stronger value chains and provision of much-needed jobs in previously disadvantaged NWDC and MKLM regions. However, it will depend on the kind of packages made available to investors and the extent to which they will offset, for particular industries, any exogenous disadvantages experienced in locating in the SEZ.

Various policy plans have informed the planning of the SEZ

- The North West Province Spatial Development Framework
- The Bojanala Fourth Generation Integrated Development Plan
- The Bojanala Platinum District Environmental Management Framework
- The Moses Kotane Local Municipality Spatial Development Framework (Nov 2010)
- The updated Spatial Development Framework of Moses Kotane (2019-2024)

## 3.1 Development Framework of SEZ

Industrial zones play a major role in employment creation in certain countries and absorption by development of SEZ including industrial estates has been reaching outstanding results especially in Asia. Special Economic Zones (SEZ's) are a potentially effective tool the South African government can use to shape and drive industrial growth. According to a research by World Bank, the employment of industrial zones in Asia and the Pacific region are providing 2.3% of total employment in the region.

## 3.2 Bojanala SEZ Development Strategy

The PV-SEZ will focus on four sectors namely capital equipment, mineral beneficiation, agro- processing and renewable energy. High level sector strategic plans have been developed for these sectors which need to be reviewed and further developed in order to strengthen the business case for them. The CSIR's Enterprise Creation for Development (ECD) Business Area was commissioned to carry out a review of the following two sectors:

- PGM
- Capital equipment and Manufacturing
- Agro processing Hi-tech
- Renewable Energy Generation
- Medical and Biomedical
- Automotive Industry

According to the Strategy the sectors will be pursued in different terms as follows:

In terms of the mining of PGM's in South Africa it is a known fact that South Africa owns the majority of the world's reserves of the Platinum Group Metals (PGMs). The main multinational mining firms and upstream processing firms are involved in the South African PGMs mining and processing industry. These PGMs are mined and processed in South Africa to the point where the metals can be used as inputs for fabrication of value-added applications, but the metals are almost entirely exported for further processing overseas. There are therefore a number of benefits that will be derived by the establishment of the Bojanala SEZ.

Furthermore, it is deemed imperative that specific education and artisanal training programmes are put in place in partnership with potential investors. Critical infrastructure such as electricity, water and broadband must also be made available and specific incentives for each industry will be needed, as well as the generic and standard SEZ package, as the requirements are very different from one business to another. The SEZ provides an opportunity for skills upgrading, technology transfer and demonstration effects. These dynamic effects have the potential to contribute further to regional development especially in the longer term.

Conjunctively, the land identified is suitable for development and conventional construction types will suffice. Preliminary desktop investigations have not identified any critical environmental issues that cannot be avoided through the implementation of mitigation measures and best practice; however further environmental studies are required in order to ensure that environmental requirements are adhered to. The Bojanala SEZ will be co-located with the existing industrial park of Bodirelo in Mogwase. The decision to locate the SEZ on this site was informed by the site possessing the following development drivers:

- Site is well located in relation to mining industries.
- Land is relatively flat and easy to develop
- Property has been made available by Moses Kotane Local Municipality
- Site is already zoned for industrial purposes.
- It is well located on the main access roads (R510 and R556)
- Services are already installed and available on the site electricity, water reservoir and a water pipeline with sufficient additional capacity)
- There is good infrastructure comprising of paved roads and rail link in the vicinity of proposed development.

Previous studies have shown that the existing infrastructure and services are adequate to sustain phase A of the proposed development. A breakdown of the findings is provided below:

- Water and sewer reticulations are currently being upgraded by the NWDC and there is enough water to cover proposed demand.
- Eskom has committed to sufficient electricity and the upgrading of the Sun City Substation has been completed. Going forward the agreement between the NWDC and Eskom provides for the proposed development to be done in phases and be aligned with Eskom future upgrade of electrical infrastructure.
- Land use planning for the proposed development has been addressed as this is essential to ensure that minimal environmental impact occurs during the operational phase of the proposed development. Applicable land zoning is important for planning purposes and ensuring building design criteria are aligned with environmental best practice is essential to minimise the environmental impact of the proposed development and refurbishment processes.

A sector study methodology was used to undertake the project and an analysis of each sector was done to identify:

- New economic interventions within the sector
- Interventions that could strengthen the current players in the sector
- Interventions to develop an enabling environment for the sector

The North West Development Corporation assists with the implementation of economic development activities in various forms in the North West Province and provided the CSIR with a document that gave key inputs into the work thus far undertaken towards the development of the Platinum Valley SEZ business case. The document titled "Strategic Plans and Align to the Platinum Valley Positioning Strategy" was compiled by Nastoserve (Pty) Ltd.
However, the information in the document along with additional existing data, published information and information gathered during stakeholder engagements was used to analyse the value chains and eventually identify of the opportunities.

This project was undertaken as two separate sector reviews that were conducted in parallel. The work was largely based on the analysis of published and existing data and information, supplemented by information gathered during stakeholder engagements in the public and private sectors. Supportively, there is synergy and symbiosis between the agro-processing and renewable energy sectors. Agricultural activity provides inputs for the agro-processing facility, as well as potential energy crops for renewable energy conversion processes. Some of the effluent for the renewable energy facility can be returned to the field as manure. In addition to taking agro-processing residues, the renewable energy facility can accept municipal solid waste and used edible oil as feedstock.
Moreover, the Mogwase area has significant potential that would make it attractive to both investors and the community that will host the PV-SEZ. Some of the reasons why the establishment of the PV-SEZ is seen as necessary include the following:

- Clustering of the four sectors which include agro-processing and renewable energy to capitalise on synergies.
- The close proximity to major mining houses, as potential suppliers, markets and partners, is an advantage
- The close proximity to the North West University could assist with capacity building, and research and development. R
- Some of the required infrastructure exists at the industrial park which is currently undergoing revitalisation as part of the dtic's industrial park revitalisation programme.
- Labour is accessible in the area through residents and mining staff that face possible retrenchment
- There is ready access to the Pilanesberg Airport, a tarred road and a railway line to the ports.

The success of the PV-SEZ lies with the involvement of the identified stakeholders who need to participate during the planning, establishment and operation phases of the PV-SEZ. Stakeholder feedback was taken into consideration when selecting business opportunities for the PV-SEZ. To attract, support and retain tenants the management of the SEZ needs to create a conducive environment through:

- Providing a facility for investors to get assistance with the investment process
- Giving investors access to key documentation
- Arranging for government departments to engage regularly with tenants to address issues
- Facilitating regular industrial symbiosis workshops
- Providing small business support, training and skills development

Additionally, tenants of the proposed PV-SEZ will benefit from the standard dtic SEZ incentives. The SEZ will not administer the incentives but could facilitate in terms of assisting its tenants to access these incentives where appropriate. Interested investors could be deterred by the Mogwase Industrial Area's current poor and deteriorating infrastructure. To avoid discouraging investors the following issues will need to be addressed:

- Security – basic infrastructure, buildings and security need to be upgraded and modernised
- Clean Up – to create aesthetically pleasing area including road upgrades, clearing of the sites and demolishing or upgrading vacant buildings
- Maintenance and Upkeep – continuous maintenance and improvement of new infrastructure once built or renovated
- Logistics infrastructure –maintaining and ensuring functional infrastructure for optimal service delivery. Road, rail and air infrastructure is available for the SEZ to use.

Conjunctively to tending to the above issues, the PV-SEZ could gain competitive advantage by having strong green economy credentials. This could be achieved by incorporating circular economy features, such as the facilitation of industrial symbiosis transactions between the tenant companies, and renewable energy generation using agro-processing waste.

Linkages with the Mogwase community could be fostered through capacity building programmes, outreach programmes with local schools thus creating awareness and interest in the PV-SEZ sectors. A focus on enterprise development and incubation would give the PV-SEZ a significant competitive advantage, in accordance with the national imperatives of economic development, job creation and poverty reduction. Proper monitoring and evaluation will need to be undertaken should the initiative be funded by government.

Agro-processing transforms products that originate from agriculture, forestry and fisheries. A key characteristic of agro-processing is its strong upstream and downstream linkages. Government has identified the agro-processing sector as one of the important sectors towards economic growth because of its potential to stimulate growth, create employment and accelerate industrialisation. Moreover, South Africa is a net exporter of agro-processing products. However, the North West's agro- processing sector is one of the largest contributing to the manufacturing GVA in the province. Agriculture and agro-processing have the potential to actualise macro-economic objectives and to create labour intensive job opportunities. The second sector that was analysed for opportunities was renewable energy, which is energy from on-going natural processes. In order to achieve energy security, Mogwase, like areas of the country, should adopt an energy mix made up of renewable energy and non-renewable systems. This notion is advocated by various policies and programmes in particular:

- The Integrated Energy Plan
- Integrated Resource Plan
- Renewable Energy Independent Power Producer Procurement Programme

## 3.3 Sector Analysis

Economistic in 2020 conducted a high-level review of the identified sectors (i.e., mining, renewable energy, mineral beneficiation and agro-processing), with the objective of identifying opportunities within these sectors and the findings are presented below:

### Mineral Beneficiation (PGMs)

The Bushveld Igneous Complex in South Africa hosts more than half the world's PGMs and associated minerals, such as nickel, chromium, vanadium and refractory minerals. South Africa is host to around 80% of the world's known platinum reserves.

PGMs consist of six noble metals, namely platinum, palladium, rhodium, ruthenium, osmium and iridium. Platinum, palladium and rhodium are the primary metals of significant economic value. They are used largely for jewellery and in the automotive industry for their excellent catalytic properties. Other uses include investment (coins and bars), fuel cells, and many other industrial purposes. South Africa is in the fortunate position that it owns approximately 63 million kilograms (kg) of a total of 66 million kg of economically viable PGMs reserves in the world. There are approximately 297 mines in the North West province according to the Department of Mineral resources statistics.

### Mining Capital Equipment Manufacturing and Supply

According to the current SEZ's Business Plan dated December 2018, the machinery subsector of manufacturing falls under two headings namely "Metals, Metal products, Machinery and Equipment" subsector (MMME) and "Electrical, Machinery and Apparatus" (EMA) subsector according to standard industrial classification (SIC) codes. It is therefore important to take this distinction into account in the review of the sector analysis.

Gross value added for the MMME subsector generally shows a trend of a boom-and-bust cycle since 2003. GVA grew to its peak of R2.97billion in 2008 which was followed by a slump of R2.3billion in 2009. This development might have resulted from the effects of commodity boom and crash before and after the global financial crisis respectively. Ever since the financial crisis GVA in the sector has increased marginally from R2.52 billion in 2010 to R2.59 billion in 2016.

### Agro-processing

Value chains and opportunities in the Bojanala region were identified in a study conducted by the CSIR, Enterprise Creation for Development, in February 2019. According to this study the opportunities were prioritised based on criteria, weightings and scores, which the NWDC had agreed to. The following Agro-processing opportunities were selected for further analysis in terms of the business concept, main products, potential markets, production processes, risks, high-level financials, job creation and investors' interest:

- Vegetables – primary processing
- Poultry – abattoir and meat processing Fruit – jam
- Maize – cereal
- Vertical farming – primary processing
- Cattle – abattoir and meat processing
- Fruit – juice
- Fruit and vegetables – crop drying
- Soybean – animal feed.

Agro-processing opportunities were analysed to determine their potential for establishing new businesses or expanding capacities of the existing businesses. The idea is to determine if there are potential businesses that could be operate from the Bojanala SEZ as tenants. A profile was compiled for each of the opportunities and has been assessed to remain relevant to the current sector overview.

**Renewable Energy**

Renewable energy is energy from on-going natural processes, such as sunshine, wind, flowing water, biological processes and geothermal heat flows. RE, except geothermal and tidal power, ultimately comes from the sun. Fossil fuels are renewable on very (geological) long time-scale but exploited at rates that may deplete these in near future.

Solar, wind and biofuels are among the more important sources of renewable energy available in South Africa, which has among the highest solar resources in the world. Most areas in South Africa average more than 2 500 hours of sunshine per year, and average daily solar-radiation levels range between 4.5 and 6.5 kWh/m2.

## 3.4 Linkages

SEZ's mission is to promote FDI to induce economic and social development of the region in which SEZ is established. For this purpose, especially for value addition to the communities of NWDC and MKLM, the Bojanala SEZ with industrial function has consider a Development Strategy with linkages as illustrated by **Figure 17.**

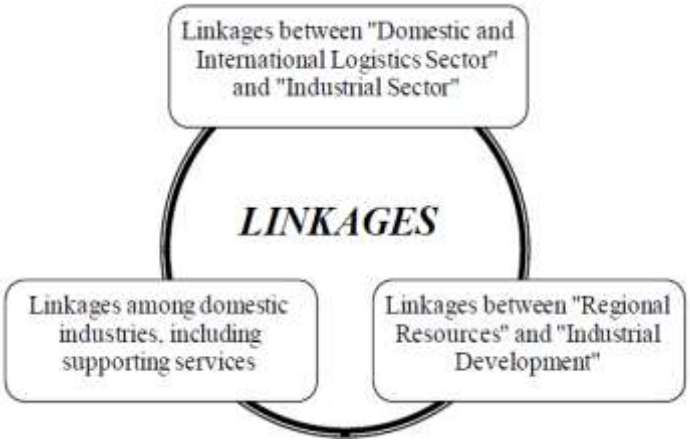



**Figure 17:** Linkage between "Domestic and International

**Logistics Sector" and "Industrial Sector"**

As a basic requirement for manufacturing work, it is necessary to bring the raw materials to be processed, and then sell the product to the market. For this purpose, sufficient logistic services, or in other words, frequent service with reasonable cost, are required. This is difficult to be solved by the factory (investor) and/or SEZ (developer). Therefore, linkage (coordination and cooperation) between logistic sector (loader and related public agencies) and SEZ needs to utilize the current system as much as possible.

**Linkage among domestic industries**

The manufacturing sector usually has a linkage between: (a) downstream, the industries which provide parts as raw material, and (b) upstream, the industry which delivers products for further manufacturing work or packaging. The shorter distance of each linkage is the better. Or at least, it should have good transportation connectivity.

**Linkage between "Regional Resources" and "Industrial Development"**

Regional resource may consist of: (a) natural resources, (b) human resources, and (c) infrastructure resources. Natural resources will be required by the SEZ targeting the development of existing natural resources in the region, while human and infrastructure resources will be required by all kinds of SEZ. To fully utilize regional resources, bottom-up approach is fundamental for SEZ development. Bottom-up approach by market driven initiative with local government cooperation is necessary for SEZ development to: (a) realize or develop SEZ by utilizing private fund, (b) maximize the cost effectiveness on the basis of marketing principles which meet the demand-supply balance, and (c) attract investor (factories and/or tenants) by private marketing networks. On the other hand, top-down initiative by the central government is also important to coordinate the SEZ projects with the national development policy, with balanced development throughout the country especially targeted to distribute the development effects.

**In conclusion** as demonstrated in the sections above, the Bojanala SEZ offers:

- Strategic location near to the Platinum Sector
- Provincial Government commitment to improve and install infrastructure
- Availability of serviced land at competitive rental rates
- Region endowed with natural resources to facilitate beneficiation and processing
- Site is already zoned for industrial purposes.
- It is well located on the main access roads (R510 and R556)

In addition, the Bojanala SEZ is consistent with the NDP and all other national policies; The area has PGM mines and reserves; there are multiple other minerals being mined in the area and the area is rapidly growing.

- The proposed SEZ development can build on the surrounding infrastructure which is already in place in Mogwase (Bodirelo Industrial area) and in the developed urban area of Rustenburg
- Upstream and midstream opportunities provide economies of scale
- There are a number of value-added opportunities that show growth in demand and potential for implementation at the proposed SEZ sites
- There is a large demand for mining input suppliers and beneficiation products in the area
- There is a socio-economic need in the area
- There is political support.

The SEZ will open opportunities for job creation during construction and operational phases. Given the existing limited economic activities in the region, it anticipated that at least 60% of the required plant and machine operators can be sourced locally and they would already be trained and have gained experience. However, a likely balance of 40% of the required plant and machine operators will need to be trained. Typically, it takes three months to train and license an operator and, in the case of overhead cranes, heavy equipment and interlink trucks, it will take approximately six months. However, what ameliorates the situation in the region, and even gives an advantage, is that it is an area where there are many retrenched mineworkers and many of these workers have plant and machine operating skills developed to a high level. It is expected that the total economy-wide value-add for the Province will increase per annum, resulting from the development of the SEZ. In summary, the cumulative contribution of the proposed SEZ to the North West Province economy is expected to be over billion in Rands over a period of 30 years.

# 4 PROJECT ALTERNATIVES

In terms of APPENDIX 3(3)(1) of the EIA Regulations (2014) (as amended 2017), an Environmental Impact Assessment Report must include –
**g) A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;**
**h) A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including –**

(i) Details of the development footprint alternatives considered;
(ix) If no alternative development footprints for the activity were investigated, the motivation for not considering such; and
(x) A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report

The followings have been considered in terms of -

- The No Go Alternative
- Location Alternatives
- Layout Design Alternatives
- Technology alternatives

## 4.1 The No Go Alternative

The no-go alternative for this project would entail continuation of the status quo. The following negative impacts would result:

- There will be no economic boost in the region which would have fed into the agro-processing, services and tourism sectors;
- The anticipated job and skills development opportunities the project presents will not be generated as the project would have sourced 60% of the required plant and machine operators locally;
- There will be a derailment in the proposed strategies for the Bojanala District Municipality's Strategic Planning and IDPs;
- There will be under utilisation of the available land which could otherwise be productive and beneficial to the local communities and the Local Municipality as they are the landowners; and
- There will be a derailment in the intended progress as mandated by strategic projects as spelled out by the NDP (see section 3).

Although the no-go alternative sees the continuation of the status quo and leads to missed opportunities, there are positive impacts it provides. These include:

- All negative impacts discussed in Section 8 of this report are avoided if this alternative is choses;
- There will be a conservation of the wetland bodies and the related ecosystems observed on the site;
- There will be a preservation of the hydrology and geohydrological nature of the site;
- There will be a protection on the related environmental sensitivities on the site including the biodiversity; and
- There will be a potential to preserve any heritage and paleontological resources in the area as the site is flagged as a high-risk area for paleontological resources.

## 4.2 Location Alternatives

**No other site alternatives** are proposed for the SEZ as criteria used for selecting a suitable location for the SEZ are based on those characteristics required for the development of an industrial node; SEZ's are a type of sectoral node. The main characteristics required are as follows:

**Land availability:**

- Ample vacant industrial land to provide for future expansion – 80ha to 1137ha
- Very low cost R160/m2 on average and as little as R27/m2 on identified city sites for green energy
- Environmental authorisation obtained for rapid development of sites for green-energy, agro-processing, Beneficiation etc.

**Spatial attributes**

- On an identified future city growth corridor between Bojanala Region (North-West) so will become less remote from urban centre
- Well located to serve renewable energy projects in the region for community and mines– chiefly an advantage for manufacturers of bulky equipment like machinery and Equipment.
- Strong local demand from mines in the region
- Close to North West agricultural land compared to other major industrial nodes – agro-processing

**Infrastructure**

- Adequate supply of bulk services for most manufacturing applications on existing developed industrial land and the new greenfield sites – since Mogwase is already an industrial area
- Electricity is the only exception and upgrades will likely be required

**Ample existing industrial property**

- +6000m2 of existing developed industrial property
- Vacancy rates are estimated at about 5%
- Occupied land is underutilised
- Developed property at R900- R2000/m2 is inexpensive
- Rentals at R15-R19/m2 are half the NW average of R32/m2

**Transport**

- Location provides option of using either of the corridors to Johannesburg or Botswana or Namibia.
- Bojanala SEZ is integrated with the regional freight movement from the nearby airport and railway, abnormal load network and planned
- improvements are in progress
- Removed from city traffic and congestion

**Labour skills and availability**

- Ample supply of unskilled and semi-skilled labour living in close proximity to the industrial area – many walking distance which is particularly advantageous for shift work
- Access to an adequate supply of skilled labour within the broader Bojanala region
- Local skills pool in electronics, steel work and other manufacturing because of the long legacy in the area because of mining

**In conclusion: No other site alternatives are proposed for the SEZ** as criteria used for selecting a suitable location for the SEZ are based on those characteristics required for the development of an industrial node. Provincial Government commitment to improve and install infrastructure; the site is suitable for development as it is

flat with very little topographical constraints and the site is located in an area that needs development. The land is available for development, Part of the land is already zoned for industrial purposes. The site enjoys good access from the main access roads R510 and R556 and most infrastructure is available.

## 4.3 Design Alternatives

### 4.3.1 Pipe Material Alternatives (Bulk Water Supply Line)

According to the Technical Infrastructure Report the following Bulk Water Supply is recommended to supply the Bodirello / Bojanala SEZ with potable water: A new 200mm diameter Bulk Supply Line from Vaalkop Water Treatment Works to the Bodirello Industrial Area of ± 28km in length. The selection of pipe materials is highly dependent on the Geotechnical sub-soil conditions, durability of materials for local Geotechnical Conditions, ease of access and maintenance by Local Authorities, availability of materials, cost of supply of materials, etc.

According to the Geotechnical Investigation conducted it is evident that the sub-soil conditions are suitable for most conventional waterline materials, i.e.:

- Soil conditions are not dolomitic;
- Soil conditions do not present any detrimental and corrosive characteristics which could damage most conventional materials.

Furthermore, according to Magalies Water, the existing supply line is a uPVC-type material.

The following pipe materials alternatives were investigated:

- **HDPE-Type Material** (**Alternative 1**): Normally required where soil conditions are dolomitic and highly corrosive; Considered quite expensive compared to other pipe materials, i.e uPVC, mPVC, concrete, steel. Normally not readily available.
- **uPVC-Type Material** (**Alternative 2**): Normally not prescribed for dolomitic soil conditions; - Relatively cheaper and more cost effective as compared to HDPE; Readily available, however, availability was a challenge during the last year and more as a result of shortage of importation of raw materials as a result of the Russia-Ukraine unrest.

**Recommendation**: It is clear from the above that the uPVC-type material is the more suitable material for the Bulk Water Line given the non-dolomitic and non-corrosive soil conditions. Also, the existing Bulk Water Supply line is uPVC. Therefore **Alternative 2** (uPVC-type) of Pipe Material is **preferred.**

### 4.3.2 Electrical Powerline Alternatives

The line route was initially selected to follow the existing Eskom Overhead Lines to minimise the environmental impact.

- **Underground Cables** (**Alternative 1**): A 132 kV cable network can be used as an alternative, but such an installation would require a trench of 28 km long x 2 m wide and 1.5m deep. It would require the excavation of +- 84 000m° of soil. In addition, from a financial perspective, the 132 kV cable network will be between 7 and 10 times more expensive than a 132 kV overhead line. Although a 132 kV cable network is an alternative, the environmental impact and cost make it not a feasible option.

The alternative entails the installation of electric cables underground rather than overhead on poles and tower. The major environmental impacts of overhead lines occur when they are already in operation. They are mainly related to birds colliding with the lines as well as the visible effects on the landscape. Whereas the most harmful part of underground cables, in contrast, is their installation.

Although underground power cables can be can assist the transmission of power across densely populated urban areas Rivers and other natural obstacles; undergrounding is more expensive, since the cost of burying cables at transmission voltages is several times greater than overhead power lines, and the life-cycle cost of an underground power cable is two to four times the cost of an overhead power line.

Typical Trench

The shunt capacitance is greater with underground cables than it is with overhead, and at the same time, the series reactance is lower. That's a consequence of the spatial physics. As a result, the use of underground cables for transmission can result in significant reactive control problems at the transmission level. That in turn means that additional equipment is required to address those reactive control problems, further increasing the effective cost of underground compared with overhead.

Underground cables also cause negative ecological impacts. When burying cables, the soil must be exchanged. Furthermore, not only do the cable routes need to be kept free from deeply rooted plants, they may not be built on for any other purpose. In addition, underground cables radiate heat. This has an effect on soil humidity, which, for example, can lead to drainage or drying out of marshes.

Laying an underground cable will affect the rights of the owners and occupants of the land on which the power line is built and used, to a degree similar to the erection of an overhead line. On principle, easements --rights of use-- are recorded in the land register. The owners receive appropriate compensation. This ensures that the transmission system operator can build the power line and subsequently access it in order to carry out the necessary maintenance and repair works. In the case of underground cable, continual and direct access for maintenance and repairs is only guaranteed when the area above the cable remains free. As a consequence, use of the underground cable route for agricultural purposes is not possible or is subject to restrictions.

Directional Drilling

- **Overhead Power Lines** (**Alternative 2**): With a 132 kV Overhead Line, the poles will be planted on average 200 m apart. For the 28 km section, approximately 140 poles will be required. The excavation for a single pole foundation is +- 10.948 m*. Thus, the total amount of soil excavated along the route is +- 1 532.72 m*.

  Whereas finding and repairing overhead wire breaks can be accomplished in hours, underground repairs can take days or weeks, and for this reason redundant lines are run. Furthermore, underground power cables, due to their proximity to earth, cannot be maintained live, whereas overhead power cables can be. Operations are more difficult since the high reactive power of underground cables produces large charging currents and so makes voltage control more difficult.

**Recommendation:** Overhead lines make up a large part of the interconnected system. They ensure low-loss transmission at 380-kV extra-high voltage, and thus guarantee reliable energy supply. Cables, in contrast, are predominately used in medium- and low-voltage networks, as well as for power distribution in densely built-up areas with high electricity demand. Nevertheless, underground cables have, in many cases,economic, ecological and legal disadvantages which must be carefully taken into consideretaion. The 132 kV overhead line would be the most feasible option from an environmental and financial perspective. Therefore **Alternative 2** (overhead) of Powerline is **preferred.**

## 4.4 Technology alternatives

### 4.4.1 Stream Crossings Alternatives (Bulk Water Supply Line)

According to the Technical Infrastructure Report, it is evident that the waterlines will be crossing the existing stream at some points.

- **Open Trench Excavation** (**Alternative 1**): This method of crossing the stream entails bulk earthworks and soil removal. This activity will alter the stream bed and may cause damage to the existing surrounding environment and stream banks. This method is normally quite fast and also quite cost-effective.
- **Trenchless** Technology via pipe-Jacking or Pipe-Drilling (**Alternative 2**): This method does not require any bulk earthworks and excavation and normally only requires excavation of “launch pits” on either side of stream where pipes are hydraulically jacked / drilled into its final position from one side of the stream to the other side. This could be a time-consuming method, dependent on the hardness of the underground material. This method is also extremely expensive.

**Recommendation**: Taking into consideration the expected damage to the riverbed and surrounding environment as a result of open trench-excavation, it is recommended that ALL pipeline stream crossings be installed via Trenchless Technology. Therefore **Alternative 2** (Trenchless) of Stream/Water Crossings is **preferred.**

### 4.4.2 Waste Water Treatment Alternatives

According to the Technical Infrastructure Report, the existing Mogwase Waste Water Treatment Plant has a current treatment capacity of 4Mf/day. This Treatment Plant is an Oxidation Pond System and has a Waste Management License in terms of Section 49(1)(a) of the National Environmental Management Waste Act, 2008. (Act No. 59 of 2008). It is recommended that the Plant be upgraded to 30Mf'/day capacity over the next 15 to 20 years.

- **Existing Pond System** (**Alternative 1**): This is a simple and natural treatment process making use of anaerobic and natural oxidation processes to break down sewer effluent via a series of retention dams. It is simple to construct. It is up to 7 times more cost-effective than conventional activated sludge treatment plants. It is simple and easy to maintain and not very reliant on electricity supply, which is a great benefit considering the current energy crisis.
- **Conventional Mechanical Activated Sludge Treatment Plants** (**Alternative 2**): Quite a complex process and complex to construct and operate and maintain. Extremely expensive to construct and to subsequently maintain. Heavily reliant on electricity. Thus, a large part of capital cost is the provision of alternative energy supply to the plant. Furthermore, due to lack of maintenance and regular power outages, these plants are prone to overflowing and polluting the surrounding environment and downstream water courses.

**Recommendation**: It is recommended that the existing pond sewer treatment system be used for further expansion and upgrading of the treatment capacity. Therefore **Alternative 1** (Existing Pond System) of the Waste Water Treatment is **preferred.**

# 5 REGULATORY AND LEGAL CONTEXT

In terms of APPENDIX 3(3)(1) of the EIA Regulations (2014)(as amended 2017), an Environmental Impact Assessment Report must include –
**e) A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.**

## 5.1 Legislation and Guidelines that have informed the preparation of this EIA Report

Several other Acts, standards or guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 3 and Table 4** respectively.

**Table 3**: Relevant legislative and permitting requirements applicable to the proposed project

| LEGISLATION | APPLICABLE REQUIREMENTS | RELEVANT AUTHORITY |
|---|---|---|
| Constitution Act (Act No. 108 of 1996) | This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:<br>a) To an environment that is not harmful to their health or well-being.<br>b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:<br>(i) Prevent pollution and ecological degradation.<br>(ii) Promote conservation.<br>(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. | |
| National Environmental Management Act (Act No 107 of 1998) | The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.<br><br>In terms of the EIA Regulations of 2017 (GNR 326) and the 3 Listing Notices (GNR 324, 325 & 327). An EIA Process is required to be undertaken for the proposed project.<br><br>***In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GN R982, as amended by GN R326) North West Development Corporation requires an Environmental Authorization for the project*** | Department of Forestry, Fisheries and the Environment - DFFE |
| National Environmental Management: Biodiversity Act (Act No 10 of 2004) | Chapter 4, Part 2 of the National Environmental Management: Biodiversity Act (No. 10 of 2004), (NEMBA) provides for listing of plant and animal species as threatened or protected. If a species is listed as threatened, it must be further classified as Critically Endangered, Endangered or Vulnerable. These species are commonly referred to as TOPS listed. The Act defines these classes as follows:<br>• Critically endangered species: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.<br>• Endangered species: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.<br>• Vulnerable species: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.<br>• Protected species: any species which is of such high conservation value or | North West Department: Economic Development, Environment, Conservation and Tourism (NW DEDECT) |

| LEGISLATION | APPLICABLE REQUIREMENTS | RELEVANT AUTHORITY |
|---|---|---|
| | national importance that it requires national protection. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).<br><br>Certain activities, known as 'Restricted Activities', are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing and exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the 23rd of February 2007 along with the Regulations on Threatened or Protected Species.<br><br>***Suitable habitat for TOP species will be assessed. There is a likelihood that they are present***<br><br>Provincially, several plants are protected by the North West Biodiversity Bill (North West Provincial Gazette, N0 7603 of 2016). The removal or pruning of these plants will require a permit from the North West Department of Rural, Environment and Agriculture Development.<br><br>***Development could impact on suitable habitat to plant species of conservation concern. Such species were not confirmed to occur; however, suitable habitat is present for two (2) Near threatened species, of which one was recorded north of the pipeline to be upgraded 50m corridor. Boophone distichia and Crinum species must be relocated to outside of the development footprint if it will be impacted on.*** | |
| National Water Act (Act No 36 of 1998) | Water uses under S21 of the Act must be licensed, unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation (and then registration of the water use is required).<br><br>Consumptive water uses may include the taking of water from a water resource and storage - Sections 21a and b. Non-consumptive water uses may include impeding or diverting of flow in a water course - Section 21c; and altering of bed, banks or characteristics of a watercourse - Section 21i.<br>In terms of Section 19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing or recurring.<br><br>***A Water Use License is required for the development as per the following specific Section 21water uses:***<br>▪ ***Storing water.***<br>▪ ***Impeding or diverting the flow of water in a watercourse.***<br>▪ ***Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.***<br>▪ ***Disposing of waste in a manner which may detrimentally impact on a water resource.***<br>▪ ***Altering the bed, banks, course or characteristics of a watercourse.***<br><br>***This is a legislative process governed by Department of Water and Sanitation (DWS) for the authorisation of all water used defined in Section 21.*** | Department of Water and Sanitation (DWS) |
| National Environmental | The purpose of this Act relates to the proper disposal of waste. The Act also provides for the waste related activities where a Waste Licence is required. This includes the recycling | Local Municipality |

| LEGISLATION | APPLICABLE REQUIREMENTS | RELEVANT AUTHORITY |
|---|---|---|
| Management: Air Quality Act (Act No 39 of 2004) | and refining of waste.<br><br>***While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan during the construction phase of the project for dust management*** | |
| National Heritage Resources Act (Act No 25 of 1999) | The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the State. "Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority".<br><br>***In accordance to Section 38 a Heritage Impact Assessments (HIAs) will be undertaken for the following associated developments: (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length; (b) the construction of a bridge or similar structure exceeding 50 m in length; (c) any development or other activity which will change the character of a site (i) exceeding 5000m² in extent)*** | South African Heritage Resources Agency (SAHRA)<br><br>Provincial Heritage Resources Authority |
| National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) | The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.<br><br>The Minister may amend the list by –<br>» Adding other waste management activities to the list.<br>» Removing waste management activities from the list.<br>» Making other changes to the particulars on the list.<br><br>In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment (BA) or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards.<br><br>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:<br><br>• The containers in which any waste is stored, are intact and not corroded or in<br>• any other way rendered unlit for the safe storage of waste.<br>• Adequate measures are taken to prevent accidental spillage or leaking.<br>• The waste cannot be blown away.<br>• Nuisances such as odour, visual impacts and breeding of vectors do not arise; and<br>• Pollution of the environment and harm to health are prevented.<br><br>***In terms of GNR921, no waste license is required for the project. No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.*** | Department of Forestry, Fisheries and the Environment - DFFE Waste Management |
| National Forests Act (Act No. 84 of 1998) | The National Forest Act, 1998 (Act No. 84 of 1998) enforces the protection of several indigenous trees. The removal, thinning or relocation of protected trees will require a permit from the local Department of Agriculture, Forestry and Fisheries (DAFF) ((Notice of | Department of Forestry, Fisheries and |

<table>
<tr><th>LEGISLATION</th><th>APPLICABLE REQUIREMENTS</th><th>RELEVANT AUTHORITY</th></tr>
<tr><td></td><td>the List of Protected Tree Species under the National Forests Act, 1998 (ACT NO 84 OF 1998), Notice 1935, Government Gazette No 46094, 25 March 2022).<br><br>Several protected trees occur in the proposed development area as shown in the table below.<br><br><table><tr><th>Scientific name</th><th>Common name</th></tr><tr><td>Berchemia zeyheri</td><td>Red ivory</td></tr><tr><td>Combretum imberbe</td><td>Leadwood / Hardekool</td></tr><tr><td>Boscia albitrunca</td><td>Witgat / Shepherd's tee</td></tr><tr><td>Sclerocarya birrea subsp caffra</td><td>Marula</td></tr><tr><td>Vachellia erioloba</td><td>Camel Thorn</td></tr></table></td><td>the Environment - DFFE</td></tr>
<tr><td>Hazardous Substances Act (Act No 15 of 1973)</td><td>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.<br><br>• Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance<br>• Group IV: any electronic product; and<br>• Group V: any radioactive material.<br><br>The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.<br><br>The chemical composition of the batteries can be dangerous and hazardous and listed in SANS1023, a license is required to be obtained from the Department of Health</td><td>Department of Health</td></tr>
<tr><td>National Road Traffic Act (Act No 93 of 1996)</td><td>• The technical recommendations for highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.<br>• Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.<br>• The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.<br><br>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include: Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. Transport vehicles exceeding the dimensional limitations (length) of 22m.</td><td>South African National Roads Agency Limited (SANRAL) (national roads)<br><br>Provincial Department of Transport</td></tr>
</table>

| LEGISLATION | APPLICABLE REQUIREMENTS | RELEVANT AUTHORITY |
|---|---|---|
| Conservation of Agricultural Resources Act (Act No 43 of 1983) | Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories:<br>Category 1 plants: are prohibited and must be controlled.<br>Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.<br>Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands.<br>These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.<br><br>***While no permitting or licensing requirements arise from this legislation, this Act will find application during the EIA process and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented.*** | DFFE |
| Subdivision of Agricultural Land Act (Act No 70 of 1970) | Details the subdivision of agricultural land and provisions under which the act is triggered. It also provides for the approval of such division by the Minister of Agriculture. Applies for subdivision of all agricultural land and long-term leasing of portions of agricultural land.<br><br>***Long-term leases on portions or subdivision of the site properties will require an approval of the Minister of Agriculture. An application to DAFF will need to be submitted detailing the areas to be subdivided or leased for the purposes of the proposed development. An application in terms of SALA will need to be undertaken and submitted following the issuing of an environmental authorisation for the proposed project.*** | .<br>Local Municipality – competent authority<br>Provincial<br><br>DFFE |
| Spatial Planning and Land Use Management Act 16 OF 2013 | **This Act** has the main objectives to:<br>• provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic;<br>• ensure that the system of spatial planning and land use management promotes social and economic inclusion;<br>• provide for development principles and norms and standards;<br>• provide for the sustainable and efficient use of land;<br>• provide for cooperative government and intergovernmental relations amongst the national, Regulations under the SPLUMA not in force yet.<br><br>Legislation that regulates Land Use Planning has led to "spatial planning tools" that are contained in Municipal and District Strategic Management Frameworks (SMFs), Strategic Development Initiatives (SDIs) and Municipal By-laws.<br><br>***The land outside the proclaimed Bodirelo industrial township, which is primarily zoned for Industrial 1 purposes, is zoned for Agricultural purposes in terms of the Moses Kotane Town Planning Scheme, 2005*** | Local Municipality |
| North West Provincial Spatial Development Framework | The North West Provincial Rebranding, Repositioning and Renewal (RRR) Strategy, aims to support the successful implementation of the National Development Plan (NDP). The RRR contributes expressively to the NDP objectives and therefore strife to bring about the desired socio-economic transformation to the people within the province. The North West Spatial Development Framework needs to be conducive for sustainable development and will provide for the execution of the following objectives:<br>"<br>*"3. Giving spatial effect to objectives set by National Government Policies on Sustainability to support the optimal integration of the aspects of social, economic,* | DEDECT |

| LEGISLATION | APPLICABLE REQUIREMENTS | RELEVANT AUTHORITY |
|---|---|---|
| | *institutional, political, physical and engineering services"* | |

## 5.2 Relevant policy used in the compilation of this Environmental Impact Assessment Report

**Table 4:** Standards and Policies

| LEGISLATION | APPLICABLE REQUIREMENTS |
|---|---|
| National Development Plan 2030 | The National Development Plan (NDP) offers a long-term perspective. It defines a desired destination and identifies the role different sectors of society need to play in reaching that goal.<br>As a long-term strategic plan, it serves four broad objectives:<br>• Providing overarching goals for what the nation wants to achieve by 2030.<br>• Building consensus on the key obstacles to us achieving these goals and what needs to be done<br>• to overcome those obstacles.<br>• Providing a shared long-term strategic framework within which more detailed planning can take<br>• place in order to advance the long-term goals set out in the NDP.<br>• Creating a basis for making choices about how best to use limited resources.<br>The Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality. The core elements of a decent standard of living identified in the Plan are:<br>• Housing, water, electricity and sanitation<br>• Safe and reliable public transport<br>• Quality education and skills development<br>• Safety and security<br>• Quality health care<br>• Social protection<br>• Employment<br>• Recreation and leisure<br>• Clean environment<br>• Adequate nutrition<br><br>***The proposed development does not take place in contrast with the objectives of the NDP, in fact the proposed development supports the objectives of the NDP.*** |
| The White Paper on Renewable Energy Policy (Renewable Energy White Paper, 2003) | The White Paper on the Renewable Energy Policy (Renewable Energy White Paper) complements the White Paper on Energy Policy discussed in section 3.2.8 above, by pledging "Government Support for the development, demonstration and implementation of renewable energy sources for both small- and large-scale applications". It sets out the policy principles, goals and objectives to achieve, "An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation". The Department of Minerals and Energy (DME) (now the Department of Energy) embarked on an Integrated Energy Plan (IEP) to develop the renewable energy resources, while taking safety, health and the environment into consideration. The government set a target of, "10 000 GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro". Four strategic areas that needed to be addressed to create the appropriate enabling environment for the promotion of renewable energy were identified. These included:-<br>• Financial instruments;<br>• Legal instruments;<br>• Technology development, and; |

| LEGISLATION | APPLICABLE REQUIREMENTS |
|---|---|
| | • Awareness raising, capacity building and education. |
| Integrated Resources Plan 2016 | The IRP 2010-30 identified the preferred generation technology required to meet expected demand growth up to 2030. The policy adjusted IRP incorporated a number of government objectives, including affordable electricity, carbon mitigation, reduced water consumption, localisation and regional development, producing a balanced strategy toward diversified electricity generation sources and gradual decarbonisation of the electricity sector in South Africa There has been some progress over the past three years, since the promulgation of the IRP 2010-30, in executing the programmes identified in the plan. A number of Ministerial Determinations have been issued and these include renewable energy, nuclear, coal and gas.<br><br>While the IRP 2010-30 remains the official government plan for new generation capacity until it is replaced by an updated plan, there are a number of assumptions that have changed and they include:<br>• The changed electricity landscape over the past three years, in particular in electricity demand and the underlying relationship with economic growth;<br>• New developments in technology and fuel options (locally and globally);<br>• Scenarios for carbon mitigation strategies and the impact on electricity supply up to 2050; and<br>• The affordability of electricity and its impact on demand and supply.<br><br>***Relevance to the proposed SEZ: The proposed SEZ will supply renewable energy in the area.*** |
| National Climate Change Response White Paper (2012) | South Africa, taking into account equity and the common but differentiated responsibilities and respective capabilities of all nations as well as the inter-generational commitment of the Environmental Right contained in Section 24 the country's Constitution, has the climate change response objective of:<br>• Making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system; and<br>• Effectively adapt to and manage unavoidable and potential damaging climate change impacts through interventions that build and sustain.<br><br>Strategies: South Africa will implement the following selected strategies (amongst others) in order to achieve its climate change response objective:<br>• The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors.<br>• The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.<br><br>***Relevance to the proposed SEZ: The proposed project is in line with the IRP 2016 and can contribute up to 50 MW of solar energy to the total requirement. This is in line with mitigation commitments.*** |
| Municipal By-Laws | Certain activities related to the proposed development may, in addition to National legislation, be subject to control by municipal by-laws. These will need to be confirmed with the Moses Kotane Local Municipality prior to construction.<br><br>*At this stage in the EIA process this list should not be regarded as definitive or exhaustive, and it is* |

| LEGISLATION | APPLICABLE REQUIREMENTS |
|---|---|
| | *probable that additional legislative requirements will be identified as the process progresses. In this regard, the Terms of Reference for most of the specialist studies include the need for a review of all relevant legislation pertaining to the proposed development.* |
| Other legislation that may be relevant to the proposed SEZ | In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the EIA. However, for the purposes of completeness, these include: -<br>• Local Municipality: Land Rezoning Permit<br>• National Energy Regulator of South Africa (NERSA): Generation License |
| National Web based Environmental Screening Tool | The National Web based Environmental Screening Tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2017, as amended to screen their proposed site for any environmental sensitivity<br><br>The Screening Tool also provides site specific EIA process and review information, for example, the Screening Tool may identify if an industrial development zone, minimum information requirement, Environmental Management Framework or bio-regional plan applies to a specific area.<br><br>The Screening Tool identifies related exclusions and/ or specific requirements including specialist studies applicable to the proposed site and/or development, based on the national sector classification and the environmental sensitivity of the site.<br><br>The Screening Tool allows for the generating of a Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2017, as amended whereby a Screening Report is required to accompany any application for Environmental Authorisation<br><br>*A **screening report** for the project is included in **Appendix G2** of the report.* |

# 6 PUBLIC PARTICIPATION PROCESS

In terms of APPENDIX 3(3)(1) of the EIA Regulations 2017 (as amended), an Environmental Impact Assessment Report must include –
**h) A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including –**

*(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;*

*(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.*

The Public Participation Process (PPP) was conducted in accordance with **Chapter 6 of the Environmental Impact Assessment Regulations,** Published in Government Notice 324 of 07 April 2017 under Government Gazette 40772**.** In addition, the PPP was guided by the Integrated Environment Management Guidelines Series 7, Public Participation in the EIA process, published in Government Gazette no. 33308, 18 June 2010.

## 6.1 Purpose of Public Participation

The engagement of Interested and Affected Parties (I&AP's) and the Stakeholder Engagement Process is an important part of any environmental Impact assessment. The main objectives of the Stakeholder Engagement / Public Participation Process include amongst others:

- Informing the adjacent landowners, tenants, residents' associations, ward councillors, the local municipality and other organs of state of the proposed project;
- Establishing lines of communication between the stakeholders, I&AP's and the project team;
- Providing all parties with an opportunity to exchange information and to express their views and concerns regarding the proposed project;
- Obtaining comments/input from stakeholders and I&AP's, and ensuring that all views, issues, concerns and queries raised are fully documented; and
- Identifying all the significant issues associated with the proposed project

In terms of the requirement of Chapter 6 of the EIA Regulations 2017 (as amended), the following key public participation tasks are required to be undertaken:

- Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- Giving written notice to:
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;

(vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
(vii) any other party as required by the competent authority.

- Placing an advertisement in:
  (i) one local newspaper; and
  (ii) in at least one provincial newspaper.
- Open and maintain a register/ database of interested and affected parties and organs of state.
- Release of a Draft EIA Report for Public Review
- Preparation of a Comments and Responses Report which documents all of the comments received and responses from the project team.

In compliance with the requirements of Chapter 6 of the EIA Regulations 2017 (as amended), the following summarises the key public participation activities conducted to date.

## 6.2 List of Stakeholder and IAPs Identified and Notified

Identification of I&APs was undertaken by the consultant through existing contacts and databases, recording responses to site notices and the newspaper advertisement, as well as through the process of networking. The **key stakeholder groups** identified include:

- **National government** departments, including:
  - Department of Forestry, Fisheries and the Environment - DFFE
  - Department of Water and Sanitation
  - Department of Agriculture, Land Reform and Rural Development
  - South African Heritage Resources Agency (SAHRA)

- **Provincial government** departments including:
  - North West Department of Economic Development, Conservation, Environment and Tourism (NW DEDECT)
  - North West Department of Agriculture and Rural Development DARD
  - Department of Trade, Industry and Competition
  - North West Department: Cooperative Governance and Traditional Affairs
  - North West Provincial Heritage Resources Authority NWPHRA.
  - Department of Water and Sanitation
  - Department of Mineral Resources
  - North West Department of Community Safety and Transport Management
  - North West Provincial Department of Public Works, Roads and Transport
  - Municipal Infrastructure Support Agent

- **Local and District Municipalities** having jurisdiction over the study area being the:
  - Moses Kotane Local Municipality's (MKLM 's)
  - The Bojanala Platinum District Municipality

- **Parastatals** including:
  - Telkom SA Limited
  - Transnet Freight Rail
  - Eskom
- **Neighbouring landowners**
- **Other potentially affected parties**
  - The Development Bank of Southern Africa (DBSA)
  - Madibeng Local Municipality.
  - Rustenburg Local Municipality.
  - Pilanesberg Airports Management and Directorate
  - Magalies Water

An I&AP's register was opened and maintained in terms of Regulation 42 and contains the names, contact details and addresses of:

i. all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
ii. all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
iii. all organs of state which have jurisdiction in respect of the activity to which the application relates.

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix D7**). While I&APs were encouraged to register their interest in the project from the onset of the process undertaken by Envirolution Consulting, the identification and registration of I&APs has been on-going for the duration of the EIA process.

## 6.3 Notification of I&APs

The PPP commenced on the **17 June 2022** with an initial notification and call to register for a period of 30 days. I&APs were notified of the Initial call to register as presented below.

### 6.3.1 Initial Notification of I&APs

Registered letters, emails and facsimiles (faxes) were prepared and distributed to the identified relevant authorities, affected and adjacent landowners and legal occupiers, ward councillors and other pre-identified key stakeholders. The notification documents included the following information:

- The purpose of the proposed project;
- Details of the NEMA Regulations that are anticipated to be applicable and must be adhered to;
- List of anticipated activities to be authorised;
- Location and extent of activities to be authorised;
- Details of the affected properties (including a locality map or an indication of where the locality map may be viewed or obtained);
- Brief but sufficient detail of the intended operation to enable I&APs to assess/ surmise what impact the project will have on them or on the use of their land (if any);

- Initial call to register duration; and
- Contact details of the EAP

### 6.3.2 Placement of Site Notices & Newspaper advertisement

A3 site notices were placed along, within and surrounding the perimeter of the proposed project area and its surroundings on **30 June 2022**. Site notices were displayed in different points within the study area. Newspaper advertisement were placed in Diamond Field Newspaper requesting Interested and Affected Parties (I&APs) to register, and submit their comments.

Proof if the above is included in **Appendix D1.**

### 6.3.3 Written notifications

Access to all information that could influence interested and affected parties has been initiated by the project announcement, which included the placement of site notices and distribution of Background Information Documents (BID's) in the areas. A Background Information Document was produced and distributed during the initial PPP phase in the form of a i) email distribution to registered I&APs ii) a "knock and drop" exercise during visits to surrounding areas iii) registered mail posted to I&APs with no email contacts and lastly iv) a notification to of the project progress

These are all included in **Appendix D2.**

### 6.3.4 Notifications of Availability of the draft EIA Report

Notification regarding the availability of the Scoping Report for public review has been given in the following manner:

- Registered letters with details on where the Scoping Report is available from, as well as the duration of the public review comment period, were distributed to all registered I&APs (which includes key stakeholders, affected and surrounding landowners, and registered occupiers);
- Facsimile notifications with information similar to that in the registered letter described above, were distributed to all registered I&APs; and
- Email notifications with a letter attachment containing the information described above were also distributed to all registered I&APs.

The Draft EIA Report was made available for public review from **03 February 2023 to 06 March 2023** for a period of 30 days at the following locations:

- Mogwase Public Library
- Dropbox link sent to registered I&APs via email
- Email copy of the EIA Report document (without appendices) sent to all registered I&APs via email

In addition, the Draft EIA Report was sent to the following authorities for review:

- Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform
- Department of Water and Sanitation

- Local & District Municipality

These are all included in **Appendix D2.**

### 6.3.5 **Stakeholder Consultation**

In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in order for I&APs to have their issues noted. I&APs will be consulted through the following means:

- Public meeting in the study area (open meeting)
- Focus group meetings (pre-arranged and stakeholders invited to attend)
- One-on-one consultation meetings (for example with directly affected or surrounding landowners)
- Telephonic consultation sessions
- Written, faxed or e-mail correspondence

These are all included in **Appendix D6.**

### 6.3.6 **Summary of Issues Raised by I&AP's**

The following selected comment and issues have been raised on the Project to date as summarised in **Table 5.** The issues and concerns were raised by means of:

- issues raised during open day meeting and focus group meetings;
- written submissions in response to advertisements
- Telephonic communications with I&AP's;
- Issues raised through written correspondence received from I&AP's (fax, email and mail)

**Table 5:** Summary of comments received

| ISSUE/ COMMENT | RESPONSE |
|---|---|
| Please note that in line with requirements of Section 29 of the Spatial Planning and Land Use Management Act (Act No 16 of 2013) read with Section 3 of the Promotion of Administrative Justice Act (Act No 3 of 2000) SANRAL have 30 days to acknowledge receipt of your application and 90 days to evaluate and provide response within 90 days.<br><br>Should you not receive any response within 120 days, kindly follow up on the enquiry by responding to Yotham Mkansi who will be dealing with it and will convert back to you. | Noted |
| 1. Cllr Thato Masko – I support the project it will bring much needed economic change in the area of Mogwase and the surrounding;<br>2. Cllr - Will there be any opportunities small enterprises at the SEZ or will it be for established businesses only? | 1. Your support for the project is noted with thanks<br>2. There should be:<br>• Creation of employment and business opportunities<br>• Creation of potential training and skills development opportunities<br>• Potential up and down-stream economic opportunities for the local, regional and national economy |
| Please assist with the inquiry below. | The matter refers.<br>From the background document and listed activities intended to be |

| ISSUE/ COMMENT | RESPONSE |
|---|---|
| Envirolution Consulting has been appointed the by the North West Development Corporation (NWDC) to undertake the EIA process for the establishment of a Special Economic Zone (SEZ) in Mogwase within the Moses Kotane LM in North West Province. A pre-appl process has been initiated with the IEM Department.<br>Among others, the applicant also intends on upgrading the existing Mogwase Waste Water Treatment facility capacity to accommodate the future SEZ Development and future proposed Developments.<br><br>We (the consultant) have interpreted the proposed upgrade as a NEMA activity (as per the above listed activity) and current permit to be amended rather than a NEM: WA listed activities altogether.<br><br>However, the DFFE (IEM) need confirmation if the activity does not require a WL which in case means this will be an integrated application. | undertaken, there will be no listed waste management activity. As a result, our participation will not add any value.<br>Lucas |
| Good day: I would like to register as an interested and affected party for the EIA for SEZ, Moses Kotane Local Municipality, North West Province. | Dear Dineo: Thank you for your email, please note that you are registered on the project database and will be kept updated on the progress of the process that is being undertaken. Please do find attached an email with the Draft Report for your review and comments. |
| Your request for comments dated 17 June refers.<br><br>The South African National Roads Agency SOC Limited (SANRAL) is an affected party. | Your letter dated 12 July regarding the above project has reference.<br><br>Your comment that SANRAL is an affected party is noted and is shared with the relevant role players whom will be in touch with yourself for guidance on the way forward. As a registered stakeholder on the project you will get an opportunity to comment on the project.<br><br>We look forward to your participation. |
| 1. Envirolution Consulting has submitted an application for Environmental Impact Assessment and the process has unfolded, whereby the Draft Scoping Report has been prepared;<br>2. The Moses Kotane Locality Municipality is satisfied with regards to the compilation of the Scoping as the Envirolution has followed all the prescribed relevant legislative, Standards or guideline and permitting requirements applicable thereof when concluding the process on the proposed project;<br>3. The Moses Kotane Locality Municipality has no objections with regards to the proposed site. | Your letter dated 25 July 2022 regarding the above project has reference.<br><br>Your comment for support of the project is received and noted.<br><br>As a registered stakeholder on the project you will get an opportunity to participate and comment further on the project. |
| The Directorate: Biodiversity Conservation has reviewed and evaluated the report and does not have any objections to the Draft Scoping Report & Plan of Study provided that all relevant National and Provincial biodiversity guidelines/regulations will be considered in the final report.<br><br>Please also note that any development within very highly sensitive biodiversity area; where residual impacts will result with very high significant impacts rating will not be supported. You are further required to assess the cumulative impacts for similar developments in proximity with the proposed site (if any) and include the EIA Screening tool results in the final report.<br><br>Furthermore, the final reports must comply with the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998.<br><br>Kindly take note that the Directorate Biodiversity Conservation would like | Your letter dated 27 July 2022 regarding the Bojanala Special Economic Zone (SEZ) Project has reference.<br>Thank you for your participation on this process, your comments and recommendations (as per the below) have been noted, these will form part the Final Scoping Report.<br><br>We look forward in engaging further with yourself<br><br>Comments are noted, the assessment cumulative impacts forms part of the EIA Plan of Study as detailed in the Scoping Report.<br><br>The team will avail themselves for a site inspection during the review of the draft EIA Report, would be even more beneficial if such inspection can be combined with the DFFE - Integrated Environmental Authorisations. |

| ISSUE/ COMMENT | RESPONSE |
|---|---|
| to conduct a site inspection for the proposed development before or after the submission of the draft Environmental Impact Assessment report.<br><br>In conclusion, the Public Participation Process documents related to Biodiversity EIA for review and queries should be submitted to the Directorate: Biodiversity Conservation at Email; BCAdmin@dffe.gov.za for the attention of Mr. Seoka Lekota | |
| The draft Scoping Report of the above-mentioned proposed development received on 07 August 2022 has reference.<br><br>Following the review of the Scoping report this Department conducted a site inspection on 02 August 2022 with Departmental officials from Development Impact Management sub-directorate Ms. Motshabi Mohlalisi and Ms. Ellis Thebe of NW Dedect together with the Environmental Assessment Practitioner Ms Sheila Bolingo of Envirolution Consulting.<br><br>During the site inspection it was observed that the SEZ zones are an extension of existing Bodirelo Industrial site at Mogwase and adjacent properties.<br><br>This Department has considered that the proposed development and establishment of the Bojanala Special Economic Zone (SEZ) consisting of different industrial zones (i.e. mineral beneficiation, mining equipment, agro-processing and renewable energy sectors as well as a rail port and two mixed used areas. The total area proposed for development is approximately 1117 hectares.<br><br>1. Proof that the various zones have been designated as Special Economic Zone<br>2. This NW dedect has noted that the SEZ is located at 1.5km from the Pilanesberg National Park and therefore consultation with the North West Parks Board regarding the application is crucial as they are the management authority of the Pilansberg<br>3. It must be taken into cognisance Platinum Valley SEZ and Moses Kotane and Rustenburg Local Municipalities are within an air quality priority area i.e. Waterberg Bojanala Priority area, declared by the Minister in June 2012.<br>4. Taking into consideration that the SEZ has potential to produce various kinds of waste i.e. the hazardous and general waste. Moses Kotane Municipality must be ready to improve of waste management strategies to incorporate SEZ<br>5. It is stated in the report that Mogwase Waste Treatment Work is serving Bodirelo Industrial Site. Moses Kotane Local Municipality has no plans to upgrade the sewage infrastructure. The proposed upgrade of bulk sewer infrastructure must be undertaken in consultation with the Municipality.<br>6. The Department has noted that there will be an upgrade of existing water pipeline from Vaalkop Dam to Boidelo Industrial site.<br><br>Follow the review of the Scoping Report, the department has no objection to the approval on the Plan of Study of Scoping Report provided for the upgrade of the bulk infrastructure however, it is recommended that the above-mentioned specialists report be included in the final Plan of Scoping to holistically assess the potential impacts on the environment of the proposed PV SEZ. | 1. The concept layout plan for the SEZ as shown in Figure 5 makes provision for 926 Industrial erven with a ruling size of 5000m². Different zones for the following Industrial sectors are shown on the concept plan.<br>2. North West Parks Board has been engaged with regarding this application, comments have not been received to date, engagement with them are ongoing throughout the EIA process.<br>3. Comment noted, the impact of the project on the air quality will be further investigated in the EIA process.<br>4. According to Moses Kotane Local Municipality there are currently two Waste Disposal Sites serving the greater Moses Kotane Local Municipality Area; these are for Domestic Waste only and not suitable for Industrial Waste. It was pointed out that there is a rehabilitated landfill site located in Phase C of the proposed SEZ Industrial Area; It is recommended that this landfill site be used for Industrial Waste purposes. Other alternative sites to be visited with Bojanala District Municipality. Further consultation to be held with Moses Kotane Local Municipality (MKLM) and Bojanala District Municipality to finalize these arrangements and specific technology alternatives will be assessed during their individual environmental authorisation application processes.<br>5. According to Moses Kotane Local Municipality, there are currently extreme challenges experienced in the Bodirelo area and according to Moses Kotane Local Municipality Infrastructure Department, there are currently no plans for upgrading of above WWTW. Based on the huge challenges faced with the existing sewer and Waste Water Treatment Capacity, it is recommended that:<br>• The existing Mogwase Waste Water Treatment facility be upgraded from 4Mℓ / day to 30Mℓ / day capacity to accommodate the future SEZ Development and future proposed Developments;<br>• The upgrading be implemented in a phased manner allowing for 5Mℓ capacity upgrades within every 2 to 3 years depending on the growth and development of the SEZ.<br>6. Based on the Water Supply challenges as pointed out by both Moses Kotane Local Municipality (MKLM) and Magalies Water and based on the Bulk Water Demand Calculations for SEZ |

# 7 DESCRIPTION OF THE AFFECTED ENVIRONMENT

In terms of APPENDIX 3(3)(1) of the EIA Regulations 2017 (as amended), an Environmental Impact Assessment Report must include –
**h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including-**
*(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;*

## 7.1 Regional Setting & Road Networks

The Special Economic Zone falls under the jurisdiction of the Moses Kotane Local Municipality in the Northwest Province and the Bojalana District Municipality. To the North of this proposed development is President Avenue, the East side is the R510 and to the south is the unnamed road running east to Ga-Ramokoka and west to the Industrial Site. The Special Economic Zone (SEZ) is connected by several roads network from the south along the National 4 (N4) there is a connection with the R104 traversing the Rustenburg CBD then connecting to the west on the R565 right into the R556 and left onto President Avenue outside the Pilanesberg International Airport.

The second connection from the Rustenburg CBD along the R104 is the R510 Road north of the centre of the business district, running north/ south to the SEZ proposed development area with connection to the SEZ off the R510 Rd. Gauteng Province is connected along the N4 onto the R556 Rd north with two opportunities off the R556 Rd onto President Ave or off the R556 Rd turns right onto the R510 Rd north (**Figure 18).** From the Limpopo Province north of the Special Economic Zone, the R510 Rd is the direct connection to the proposed site development running north/ south.


**Figure 18:** Regional Locality/ Road Network

## 7.2 Biophysical Attributes/Features of the Study Area

Geographical features are man-made or naturally-created features of the Earth. Natural geographical features consist of landforms and ecosystems.

### 7.2.1 Surrounding Land uses

Historically the SEZ study areas was predominantly vacant land with some small-scale agriculture and grazing activities (see **Figure 19**). Watercourses can be seen throughout and adjacent to the study site. Urbanisation has occurred, mostly away from the watercourses. However, the industrial area that can be seen in the northeastern corner of the study site has encroached onto a watercourse and significantly impacted on the watercourse and reduced its footprint. In the same watercourse towards the centre of the study area an existing WWTP has also impacted on the same watercourse. Woody vegetation cover is abundant and clear within the watercourses as expected for riparian areas, however, recent changes such as stormwater inputs, removing of trees for wood and has created some areas resembling wetlands within the riparian areas.

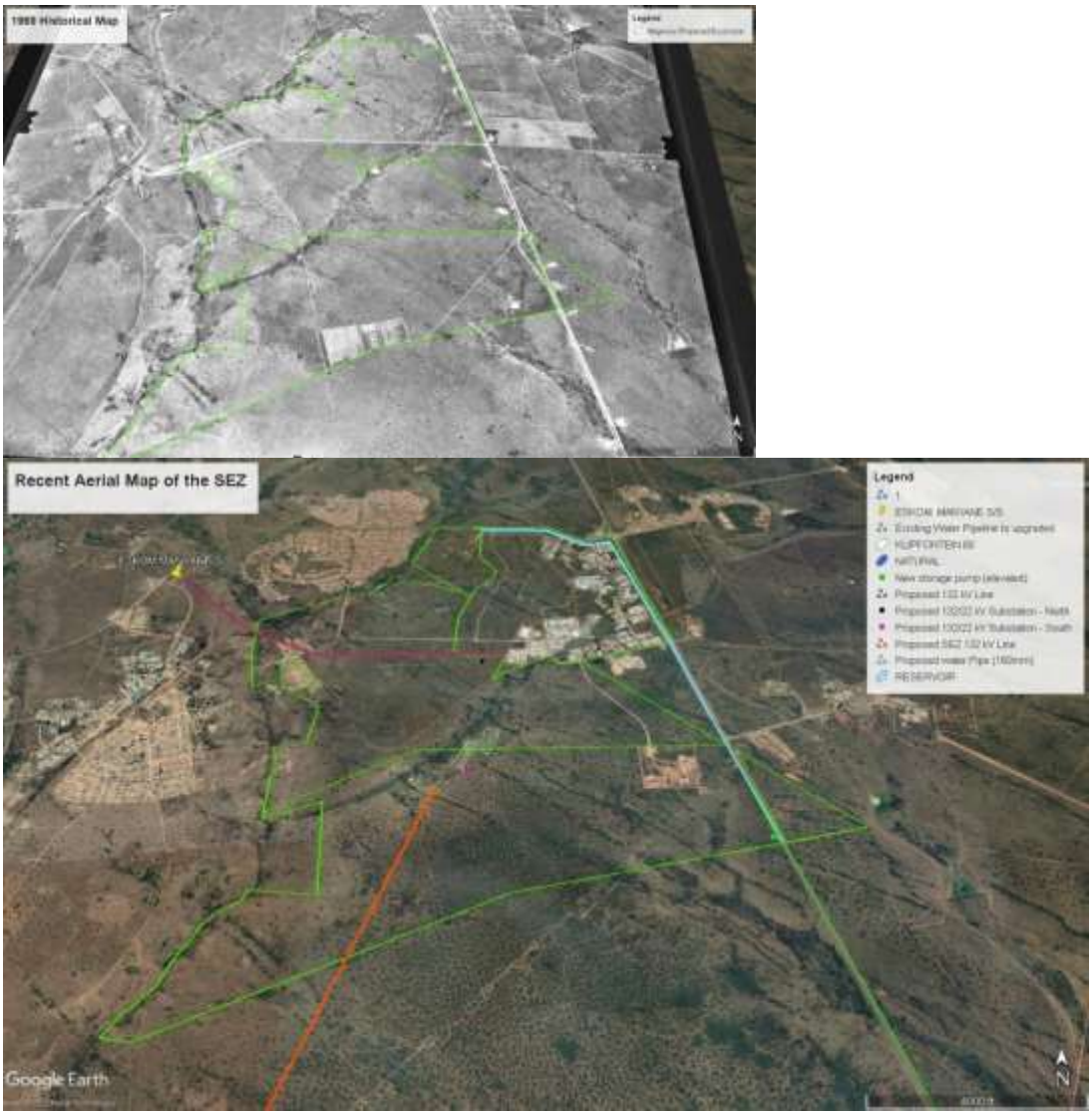



**Figure 19:** Historical Map of 1969 (Top) compared to a recent map (2022 - Google Earth Images, 2022) indicating the changing landscape as well as recent infrastructure impacting on existing watercourses.

### 7.2.2 **Regional Climate**

Summer-rainfall region (November – April) with a MAP ranging between 500 and 700 mm; two other prominent seasons are evident, namely a cool dry season (May - mid-August) and a hot dry season (mid-August – October). Winter months are very dry with frost occurring fairly infrequently. Mean Annual Potential Evaporation of 2234 mm.

### 7.2.3 **Topography**

The natural topography of the study area is predominantly even with slight undulations around river systems and drainage lines. The typical relief could be described as an even plain, but a distinct mountain complex, named the Pilanesberg Mountains, are found to the west of the SEZ. According to sources, this ±25 km diameter mountainous ring was created by a series of volcanic eruptions. Natural erosion has since reduced the initial height of the mountains to 300-500 m higher than the surrounding landscape. This is considered a unique geological and topographical feature in the context of the landscape.

The Mankwe River flows out of the Pilanesberg Nature Reserve and joins the Elands River which runs in a west-east direction, south of the SEZ zone. The Elands River drains into the Vaalkop Dam, which, below its dam wall, is the starting point of the water pipeline. Numerous other tributaries drain into the Elands River, which is considered the main river system in the study area. It creates a shallow basin through the evenly shape plain, and joins up with the Crocodile River, below the Vaalkop Dam.

### 7.2.4 **Soil & Geology**

Sedimentary rocks of the Waterberg Group; most importantly sandstone, conglomerate and siltstone of the Alma Formation and sandstone, siltstone and shale of the Vaalwater Formation. The soil classification available for the study site indicates the presence of Fa4 and Fb149 soils. The largest part of the study site is located on Fa4 soil, with a smaller part in the west located on Fb149 soil. Hutton, Clovelly and Glenrosa soils may occur. The area is a combination of Bb, Fa, Ba, Bd and Ac land types (**Figure 20**).

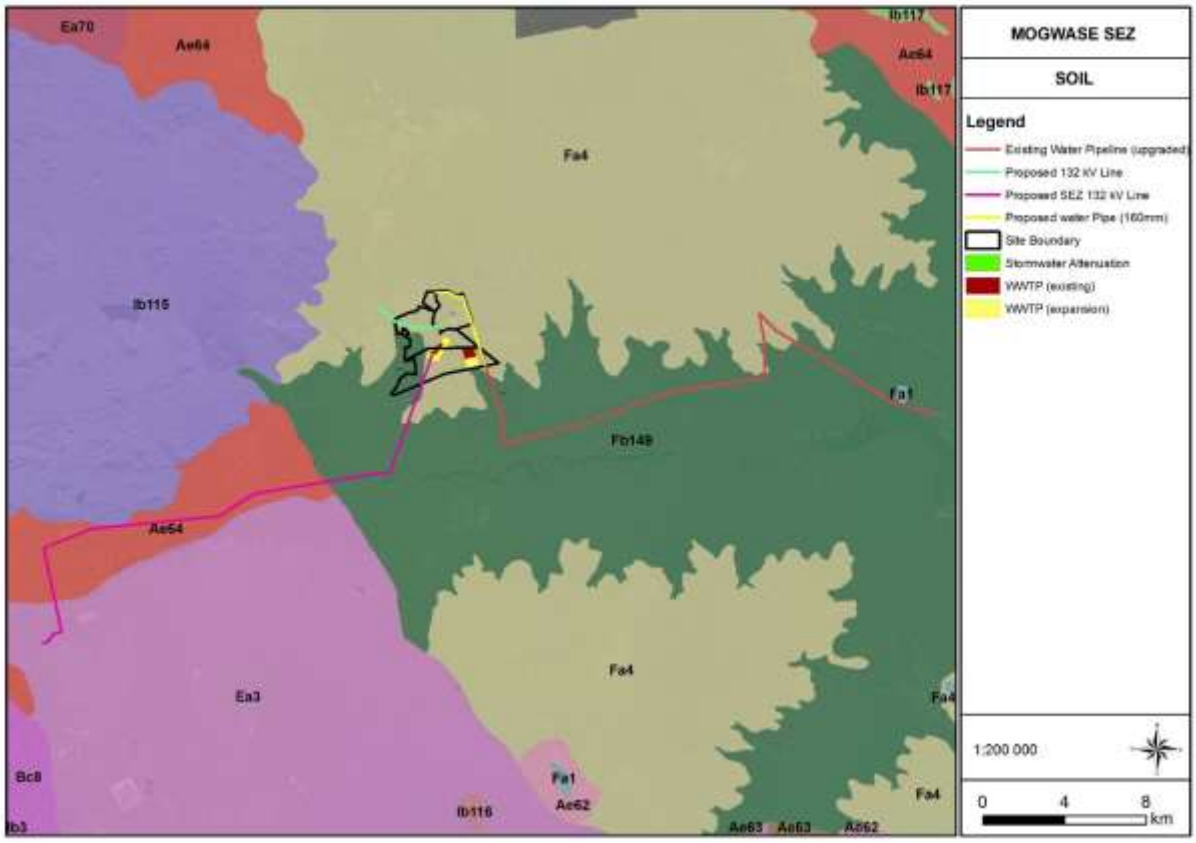


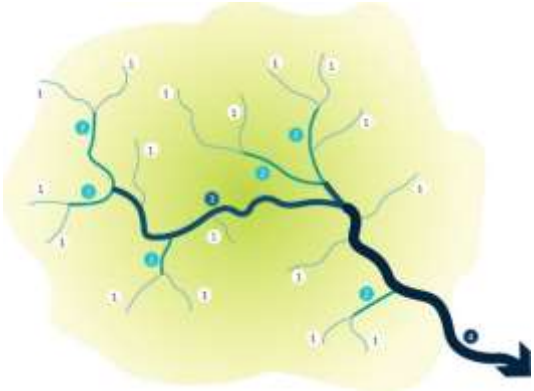

**Figure 20:** Soil of the proposed the study area.

## 7.3 Water Resources of the study area

A review of available literature and spatial data formed the basis of a characterisation of the biophysical environment in its theoretically undisturbed state and consequently an analysis of the degree of impact to the ecology of the study site in its current state. **Table 6** below provides a summary of the important aspects.

**Table 6:** A summary of relevant site information obtained from a review of available spatial data

| **National Screening Tool (Https://screening.environment .gov.za/screeningtool** | |
|---|---|
|  | The Aquatic Biodiversity of the study site is made up of areas with Low sensitivity and areas of Very High sensitivity. The areas of Very High sensitivity coincide with the rivers and streams that flow through the landscape. A large area with Very High sensitivity can be seen to the East of the study site. |
| **Strategic Water Source Area (Le Maitre *et al.*, 2018)** | The study site is not located within a Strategic Water Source Area. |

| | |
|---|---|
| **Important Rivers (CDSM, 1996)** | The Elands River flows into the Vaalkop Dam near the Vaalkop WTP. The Elands River flows parallel to the entire study site. At a point the Madibamatsho River and Existing Water Pipeline cross each other. The Madibamatsho River then flows into the Elands River South of the Existing Water Pipeline. The Mankwe River and the Proposed SEZ 132 kV Line also cross each other, whereafter the Mankwe River flows into the Elands River South of the Proposed SEZ 132 kV Line. |
| **Quaternary Catchment** | A22F and A22J (see **Figure 21**) |
| **WMA (Government Gazette, 16 September 2016)** | #1 Limpopo.<br>Major rivers include:<br>• Limpopo,<br>• Matlabas,<br>• Mokolo,<br>• Lephalala,<br>• Mogalakwena,<br>• Sand,<br>• Nzhelele,<br>• Mutale,<br>• Luvuvhu. |
| **DWAF (2014)** http://www.dwa.gov.za/iwqs/rhp/eco/peseismodel.aspx | 781 (Madibamatsho River) (PES=D) (EI=High) (ES=High)<br>818 (Elands River) (PES=C) (EI=High) (ES=High)<br>790 (Mankwe River)(PES=C) (EI=High) (ES=High) |
| **Wetland Ecosystem Type** | Central Bushveld Group Group2 & 3 |
| **NFEPA Wetlands** | Both NFEPA and NBA wetlands are common around the entire study site. A NFEPA classified wetland is evident in the area set out for the Proposed 132/22 kV Substation – South. This also affects the Expansion of the Existing WWTP in that specific area. Another NFEPA wetland can be seen approximately 350m East of the Proposed 132/122 kV Substation – North. The Stormwater Attenuation is also in an area where NFEPA wetlands are found. In close proximity (approximately 800m East) to the New Storage Pump (Elevated), more NFEPA wetlands are evident. The majority of the areas classified as NFEPA wetlands are artificial impoundments. |
| **Strahler Stream Order**  | The majority of the steams assessed are classified as 1st or 2nd order Episodic streams, with some Ephemeral and Perennial streams of larger orders such as 3rd, 4th and 5th with regards to larger rivers associated with the study area such as the Elands River. |

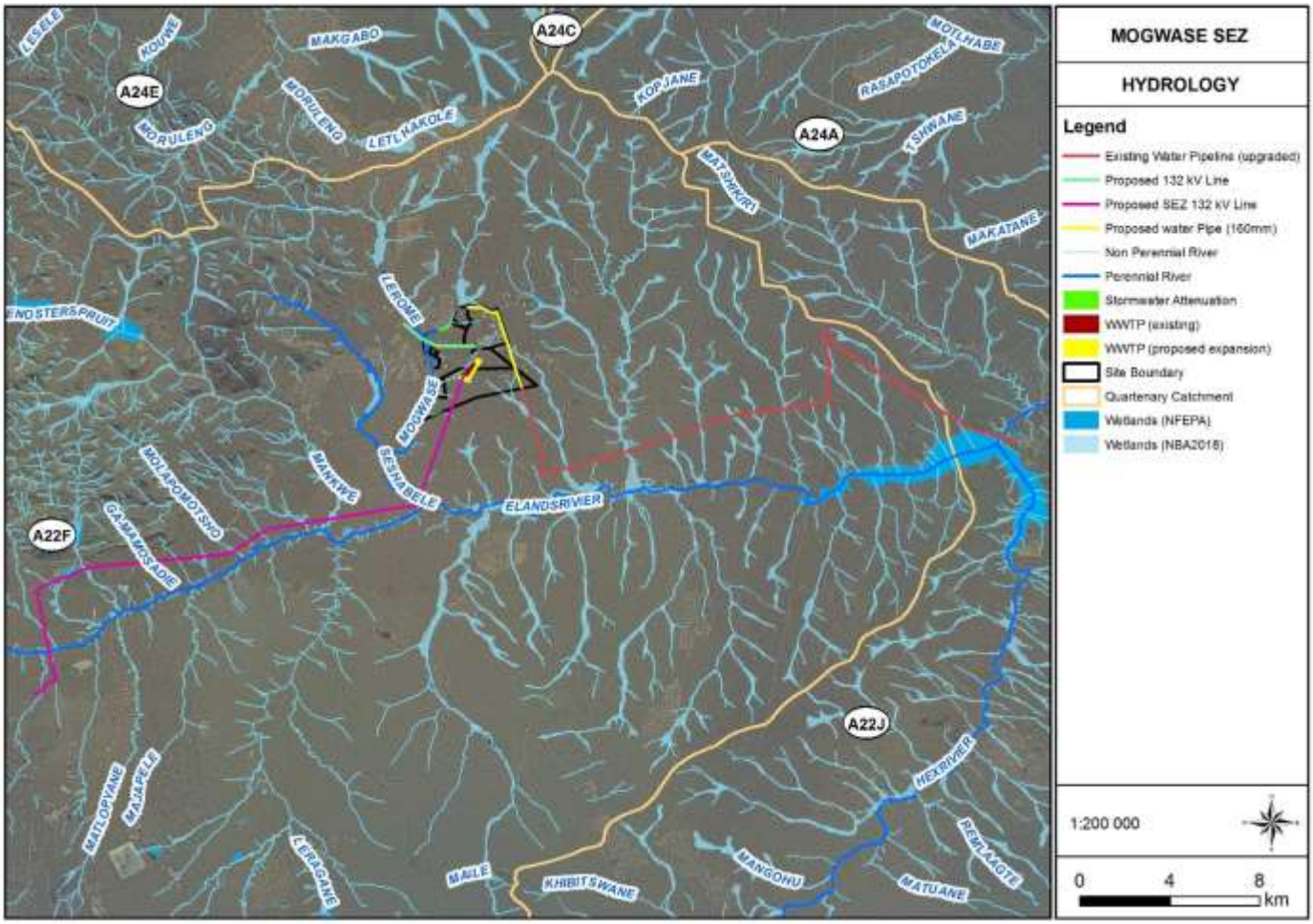



**Figure 21:** Regional hydrology

## 7.4 Ecological Profile

### 7.4.1 Vegetation

**Historical Vegetation Type Overview:** The site and linear infrastructure are situated within the Savanna biome of South Africa and in specific within the Central Bushveld Bioregion. The Savanna biome is the largest biome in southern Africa, occupying over one-third of the surface area of the country (Mucina & Rutherford, 2006). It is characterised by a grassy ground layer and a distinct upper layer of woody plants (Mucina & Rutherford, 2006).

Most of the proposed development footprint is situated within the Central Sandy Bushveld vegetation type (Mucina & Rutherford, 2006) (Figure 4). In its undisturbed, natural state, the Central Sandy Bushveld vegetation comprises tall, deciduous *Terminalia sericea* (silver cluster-leaf) and *Burkea africana* (wild seringa) woodland on deep sandy soils and low, broad-leaved Combretum woodland on shallow rocky or gravelly soils. Species of *Vachellia, Senegalia, Ziziphus* and *Euclea* are found on flats and lower slopes on eutrophic sands and some less sandy soils. *Vachellia tortilis* may dominate some areas along valleys. Less than 3% of this vegetation type is statutorily conserved, while about 24% is transformed by cultivation and urban and built-up areas, as well as rural communities. This vegetation type is regarded as Vulnerable (Mucina & Rutherford, 2006).

The most western extent of the longer 132 kV powerline traverses the Zeerust Thornveld. This vegetation comprises deciduous, open to dense short thorny woodland, dominated by *Vachellia* and *Senegalia* species with herbaceous layer of mainly grasses on deep, high base-status and some clay soils on plains and lowlands, also between rocky ridges. This vegetation type is not currently threatened

**Listed Ecosystems:** According to the 2011 Listed Ecosystems, the project area is not within a listed ecosystem (Government Gazette 34809, Government Notice 1002, and 9 December 2011). Although the National List of Threatened Terrestrial Ecosystems published in terms of the Biodiversity Act in 2011 remains in legal force, the data contained in the recent National Biodiversity Assessment (NBA) 2018 represents an update of the assessment of threat status for terrestrial ecosystems. The updated threatened ecosystems as per the recent NBA (2018) also list the site within a Least Concern ecosystem. The proposed development will thus not impact on threatened ecosystems.

**North West Biodiversity Conservation Assessment:** The North West Biodiversity Conservation Assessment includes reference to Critical Biodiversity Areas (North West DACE, 2009). Critical Biodiversity Areas (CBA's) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision making. CBA's are therefore areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses (North West DACE, 2009). In addition, the conservation assessment also made provision for Ecological Support Areas (ESA's), which are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for CBA's (North West DACE, 2009).

Most of the proposed development area falls within a CBA2, the CBA2 category comprises remaining natural patches larger than 5ha of provincially endangered and vulnerable ecosystems, or important fauna habitats. As the site does not fall within endemic or endangered vegetation, or a listed ecosystem, the CBA2 is designated due to fauna habitats as well as buffer area to the Pilanesberg National Park. Smaller portions of the project area fall within an ESA 1, associated with drainage lines and ESA2, which mostly comprised cultivated fields. These areas should be managed to maintain as much ecological functionality as possible, especially landscape connectivity (**Figure 22**).

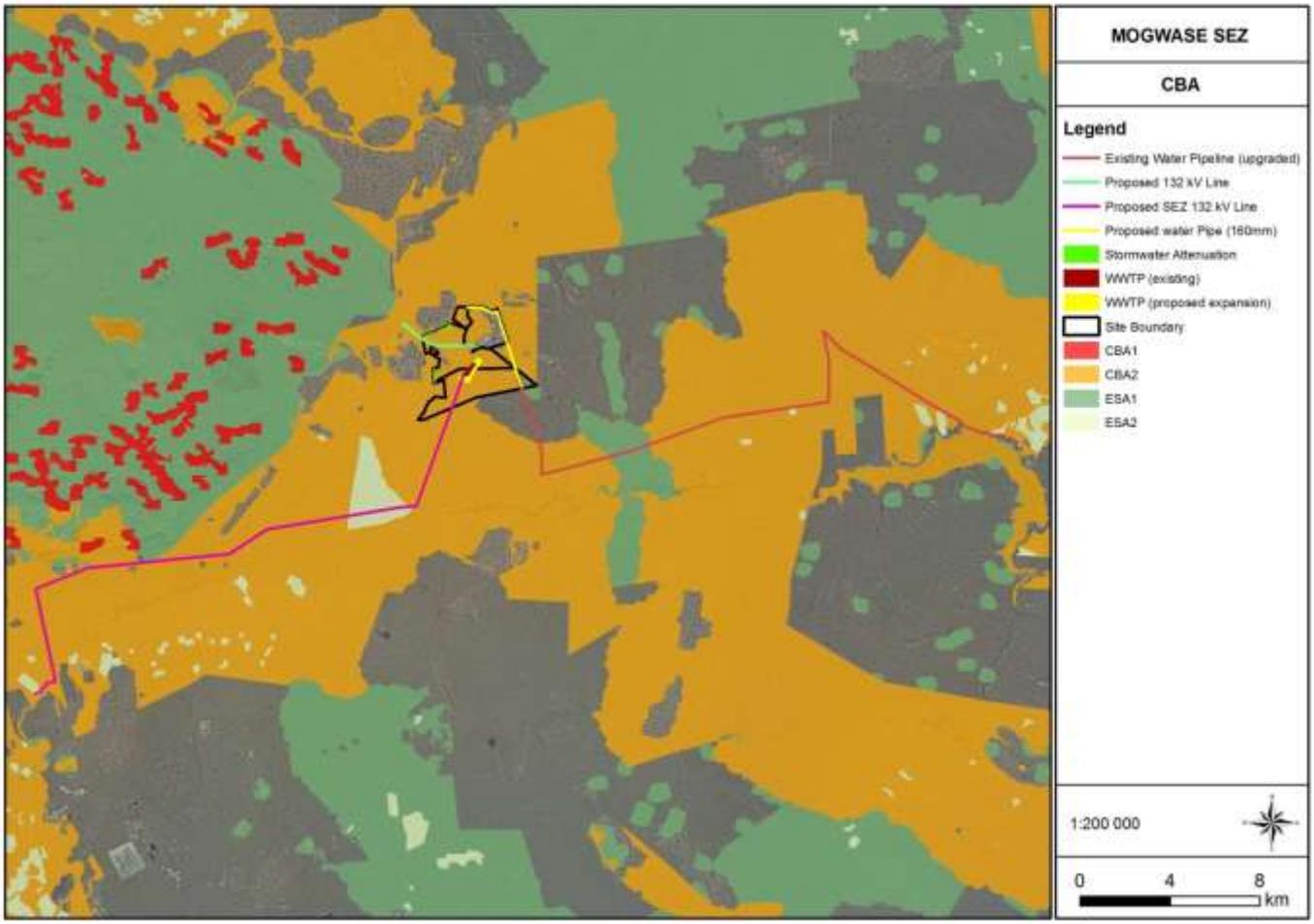



**Figure 22:** The site in relation to the North West Biodiversity Conservation Assessment map

**Protected Areas:** The Pilanesberg National Park is situated about 1.8km north-west of the proposed development site (**Figure 23**). The 132kV powerline route traverses a portion of the Pilanesberg National Park. The existing pipeline route to be upgraded traverses the Vaalkop Nature Reserve.

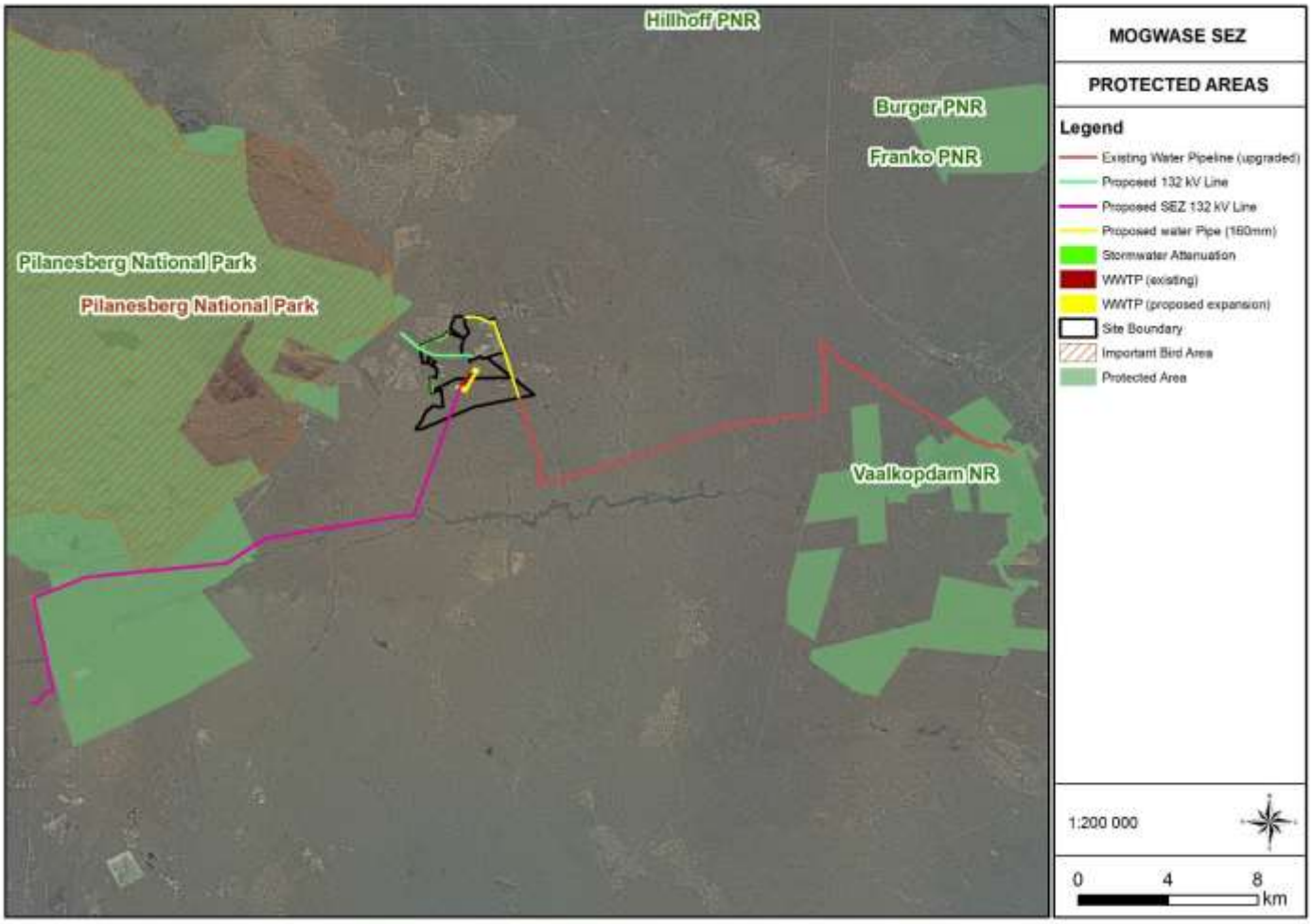



**Figure 23**: Protected Areas

**Plant Species of Conservation Concern:** A list of seven (7) plant species of conservation concern that were previously recorded in the quarter degree square (qds) that the project area is situated in, or for which suitable habitat is present within the study area.

- Species recorded: Three (3) species listed in Appendix C were confirmed to occur. Two of the species was historically classified as Declining. However, this category has been removed and the species were both reclassified to Least Concern. Although no longer considered of conservation concern, this report lists the species as the populations are still declining. One of the species, *Boophone distichia,* is also provincially protected and the other, *Vachellia erioloba*, is a nationally protected tree. One individual of a Near threatened species were recorded outside of the existing pipeline servitude (Appendix E2). However, it is likely that this species occurs sporadically throughout the development footprint.

- Species likely present: Other than the species recorded, suitable habitat is present for one Near threatened species (Appendix E2). This species has an affinity for black clay soils which was present at numerous drainage lines. Clay areas within the proposed development footprint of the specific individual industrial and commercial activities should be further assessed for the present of this species prior to development.

**Protected plants and trees**

- NEMBA **Threatened or Protected Plant Species (TOPS):** No TOP species were recorded or are expected to be present within the development footprint.

- Provincially **Protected Plants:** Provincially, several plants are protected by the North West Biodiversity Bill (North West Provincial Gazette, N0 7603 of 2016). The removal or pruning of these plants will require a permit from the North West Department of Rural, Environment and Agriculture Development.

The table 6 below list the provincially protected plant species that were recorded.

**Table 7:** Provincially protected plants observed

| Plant specie | Common name | Vegetation group |
|---|---|---|
| *Boophone distichia* | Poison bulb | Wooded grassland; and<br>Mixed bushveld dominated by microphyllous species |
| *Crinum species* | Lily | Clay drainage lines within the *Senegalia melifera-Tarchonanthus camphoratus* bushveld close to Ngwedi substation |
| *Stapelia* cf *gigantea* | Carrion flower | *Senegalia melifera-Tarchonanthus camphoratus* bushveld; and<br>Mixed bushveld dominated by microphyllous species |
| *Huernia* species | | *Senegalia melifera-Tarchonanthus camphoratus* bushveld |
| *Duvhalia cf polita* | | Mixed bushveld dominated by microphyllous species |
| *Sirostachys africana* | Tamboti tree | *Dichrostachys-Terminalia sericea* bushveld on deeper soils. |

**National Protected Trees:** The National Forest Act, 1998 (Act No. 84 of 1998) enforces the protection of several indigenous trees. The removal, thinning or relocation of protected trees will require a permit from the local Department of Agriculture, Forestry and Fisheries (DAFF) ((Notice of the List of Protected Tree Species under the National Forests Act, 1998 (ACT NO 84 OF 1998), Notice 1935, Government Gazette No 46094, 25 March 2022). Several protected trees occur in the proposed development area.

Table 8 below list the most likely species to be present and the field survey should assess whether these species are present.

**Table 8:** Protected tree species likely to be present

| Scientific name | Common name |
|---|---|
| *Berchemia zeyheri* | Red ivory |
| *Combretum imberbe* | Leadwood / Hardekool |
| *Boscia albitrunca* | Witgat / Shepherd's tee |
| *Sclerocarya birrea* subsp *caffra* | Marula |
| *Vachellia erioloba* | Camel Thorn |

**Alien Invasive Plant Species:** The Table 8 lists the category 1b species recorded. *Cereus jamacura* and *Opuntia ficus-indica* were widespread but occurred sporadically. Other species were more prolific in disturbed areas and areas close to infrastructure and human settlements.

**Table 9:** Category 1b invasive plant species recorded

| Species | Common name | Vegetation groups |
|---|---|---|
| *Argemone ochroleua* | Mexican poppy (White) | Mainly within modified areas and close to access roads and human settlements |
| *Cereus hildmannianus / jamacaru* | Queen of the night | Entire study area |
| *Datura ferox* | Large thorn apple | Mainly within modified areas and close to access roads and human settlements |
| *Flaveria bidentis* | Smeltersbush | Mainly within modified areas and close to access roads and human settlements |
| *Malvastrum coromandelianum* | Prickly malvastrum | Mainly within modified areas and close to access roads and human settlements |
| *Melia azedarach* | Syringa | *Searsia lancea* riparian woodland |
| *Opuntia ficus-indica* | Sweet prickly pear | Entire study area |
| *Tecoma stans* | Yellow bells | Mainly within modified areas and close to access roads and human settlements.<br>Mixed bushveld |
| *Verbena bonariensis* | Wild Verbena | Along watercourses and drainage lines |

### 7.4.2 **Fauna**

**Mammals:** In terms of the ADU list and historical species, the following is relevant:

- Unidentified species on the ADU list have not been included in this report.
- Species names are indicated as per the latest mammal Red-Lists (Child *et al.*, 2016).
- *Lepus victoriae* has a distribution over the area of interest and has replaced the ADU *Lepus saxatilis* which does not.

The North West Province lists several bats as provincially protected species and warrants a specific mention. The project area provides some natural roosts and man-made roosts and includes trees and hollows in trees, human dwellings and other structures with roofs. In addition, the surrounding Rocky Mountains and hills may also provide roosts in crevices and small caverns. Therefore, bats are likely to occur in the surrounds and will forage over the surrounding bushveld. No significant direct impacts are expected to sensitive roost sites.

**Herpetofauna:** In terms of the ADU list the following is relevant:

- Omitted species are excluded from this report.
- The species names used in this report are as per Bates *et al.* (2014) and du Preez and Carruthers (2009).
- *Leptotyphlops distanti* and *Leptotyphlops scutifronss* have distributions over / near the area of interest (the latter being marginal) and are included in Appendix E3 to represent the ADU *Leptotyphlops* sp

Many of the herpetofauna species feed on arthropods and will cumulatively contribute to control of invertebrate numbers, including aquatic invertebrates that may be vectors for disease. Many reptiles and frogs are also food source to many birds and mammals, as well as other reptile species.

**Invertebrates:** No invertebrate SCCs are listed in the Environmental Screening Report.
The following is relevant in terms of the TOP invertebrates:

- No TOP butterflies were recorded for the QDGS.
- Two top TOP Odonata were recorded for the QDGS:
  - *Lestes dissimulans* (Odonata: Lestidae) (RL Vulnerable).
  - *Pseudagrion coeleste* (Odonata: Coenagrionidae) (RL Vulnerable).
- Two TOP scorpions were recorded for the QDGS, both also provincially protected:
  - *Hadogenes gracilis* (Scorpiones: Liochelidae) (GN151 Protected).
  - *Opistophthalmus pugnax* (Scorpiones:Scorpionidae) (GN151 Protected).
- No TOP spiders were recorded for the QDGS.

The provincially protected species often include entire genera (spiders and dung beetles), and therefore provincially protected species are only discussed generally and only where such species have been recorded (ADU, iNaturalist) in the general area. The following provincially protected invertebrates are confirmed for the QDGS:

- *Charaxes brutus natalensis* (Lepidoptera: Nymphalidae).
- *Charaxes jahlusa rex* (Lepidoptera: Nymphalidae).
- *Charaxes vansoni vansoni* (Lepidoptera: Nymphalidae).
- *Sisyphus* sp. (Coleoptera: Scarabaeidae).
- *Scarabaeus ambiguus* (Coleoptera: Scarabaeidae).
- *Scarabaeus lamarcki* (Coleoptera: Scarabaeidae).
- *Hadogenes gracilis* (Scorpiones: Liochelidae) (GN151 Protected).
- *Opistophthalmus pugnax* (Scorpiones:Scorpionidae) (GN151 Protected).

The following is relevant in terms of vertebrates:

- Other than the African Finfoot (*Podica senegalensis*), Lappet-faced Vulture (*Torgos tracheliotus*) and Black-footed Cat (*Felis nigripes*), the listed SCCs have been historically recorded in the QDGS (which incorporates the Pilanesberg PA). SCCs will form the focus of field work and include:
  - Black-footed Cat (*Felis nigripes*) and the Southern Mountain Reedbuck are confirmed to occur in the areas designated with high animal species sensitivity (Plan 6) in the far western parts of the site; no recent records occur for the prior species in the QDGS despite sharing area with the PA.
  - African Wild Dog, Sensitive Species 5, Lappet-faced Vulture, Tawny Eagle, Secretarybird and African Finfoot may utilise areas designated with medium animal species sensitivity (Plan 6) over the southern half of the project area. A habitat assessment will be completed of this area, including overall assessment of other ecological attributes that may be of significance to the species to determine their likely use of the site.

- The site may support five TOP mammals that cannot be excluded from the project area due to the potential presence of adequate habitat, largely discrete units such as the riverine areas.
- The site provides potential habitat for two TOP birds, both mobile raptors unlikely to be significantly impacted by the development.
- It is suspected that the site will not have sufficient rocky habitat on site for rocky habitat species.
- The area has no natural surface water resources. Congregatory water birds are unlikely on site in significant numbers and are unlikely to utilise the area for breeding.
- The area is not an area of faunal endemism.

In terms of invertebrates:

- No SCCs were listed in the screening report.
- Four TOP invertebrates (two of which are also provincially protected) have been recorded for the area. The two provincially protected species are affiliated with rockier terrain and the site may not have adequate habitat for these species.
- An additional 6 provincially protected beetles and butterfly have been recorded for the QDGS and cannot be excluded from the project area.

### 7.4.3 **Avifauna**

#### i. Special Economic Zone (SEZ)

The proposed SEZ zone lies within the Central Sandy Bushveld vegetation type (SVcb 12; Limosella Consulting 2022). The natural vegetation comprises thorny and mixed woodland types (**Figure 24**). There has been extensive loss of woody vegetation in parts (Limosella Consulting 2022) but also bush encroachment by *Dichrostachys cinerea* caused by overgrazing. The zone is associated with the densely settled Mogwase town and is extensively modified as a result from urbanisation, industrialization, road building, etc.

**Figure 24:** General view of the natural woodland habitats at the SEZ zone.

Several watercourses skirt or traverse the zone, the largest of which is the Mogwase River and its tributaries **(Figure 25**; Limosella Consulting 2022). Several wetland areas occur along these watercourses but many of these are artificial in nature and result from modifications in streamflow from anthropogenic sources, e.g. impoundments (Limosella Consulting 2022). Pilanesberg Nature Reserve, which is also a designated Important Bird and Biodiversity Areas (IBA), is situated some 1.5 km west of the zone at its closest point.

**Figure 25:** A tributary of the Mogwase River where it flows through the SEZ zone.

### ii. Power line (132kV) from Ngwedi Substation to SEZ

The proposed 27 km 123kV power line between the SEZ site and the Ngwedi Substation traverses two vegetation types: Central Sandy Bushveld (SVcb) in the east and Zeerust Thornveld (a largely thorny woodland type) in the west (Limosella Consulting 2022; **Figure 26**). This stretch of power line crosses 16 watercourses (Limosella Consulting 2022).

**Figure 26:** General view of the natural woodland habitats along the 123kV power-line route between the SEZ zone and the Ngwedi Substation (with the Pilanesberg hills in the background).

The power line is routed relatively close to Pilanesberg Nature Reserve and IBA, especially in the area just east of Sun City.

### iii. Upgraded bulk water pipeline Vaalkop to SEZ

The proposed 29 km upgraded bulk water pipeline between the SEZ site and the Vaalkop Water Treatment Plant Traverses Central Sandy Bushveld (SVcb; Limosella Consulting 2022; **Figure 27**). This stretch of pipeline also crosses numerous watercourses (Limosella Consulting 2022).

**Figure 27:** General view of the woodland habitats along the upgraded water pipeline linking the SEZ zone and the Vaalkop Water Treatment Plant. The pipeline traverses' part of Vaalkop Dam Nature Reserve in the far east of its route.

## 7.5 Cultural Heritage Aspects of the area

### 7.5.1 Heritage Aspect

According to the Chief Surveyor-General, the farm Olivenboom was first surveyed in 1894. In 1895, it was granted to J.G. Theunissen and C.J.H du Plessis by Deed of Grant 118/1895. Although the same document for the farm Klipfontein is not available on the CS-G database, it can be assumed that it would have been surveyed at the same time. The farms were therefore in all likelihood used by white farmers for gazing and agricultural planting.

Early aerial photographs, dating to 1949 (**Figure 27**) shows a region with very limited development. The most visible are the various roads and track criss-crossing the region. A few man-made features can also be identified, some of which are interpreted as farmsteads/homestead and a number of dams. No typical stone walled site dating the Late Iron Age can be identified.

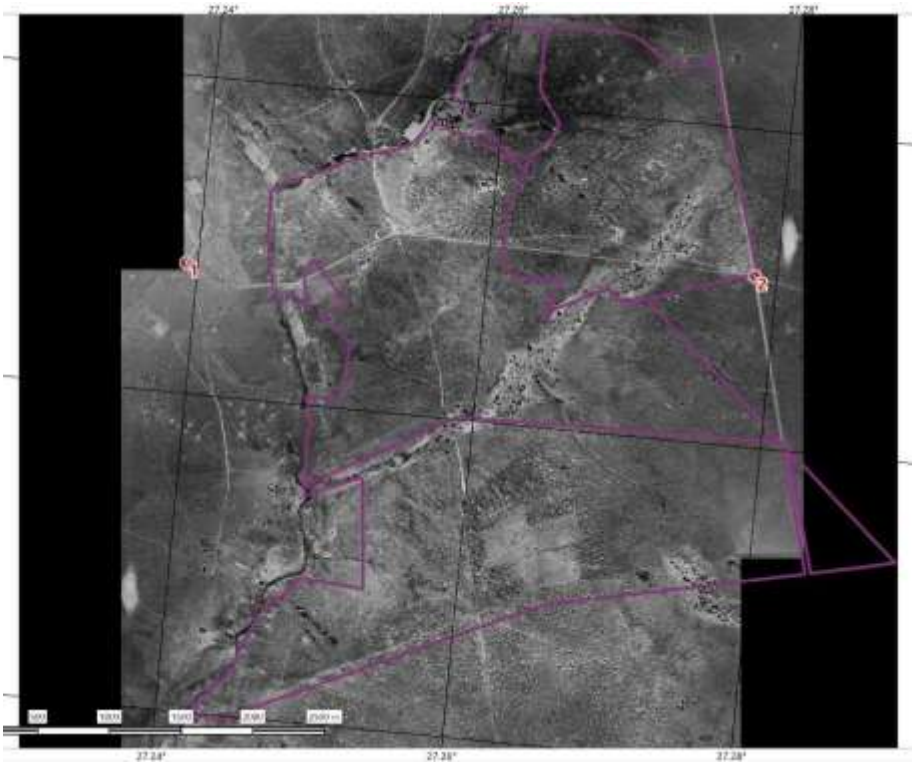


**Figure 28:** Aerial view of the project region dating to 1949 *(CS-G photograph: 218_030_01163; 218_031_01308) (red wheel-crosses = calibration points)*

**Site specific review**: The situation described above does not change very much over the next couple of years. By 1961 (**Figure 29**) it is still very much vacant land. Most development seen to have taken place outside of the project area, in the Heystekrand region to the west. However, by the 1970s things set to change much as this was the time when the former nationalist government implemented the policy of separate development. The area under consideration became part of the "independent" Republic of Bophuthatswana, that was specifically created to accommodate people of SeTswana-speaking origin. Large numbers of people were relocated to these areas and so-called economic development zones were established, one of which was at Bodirelo.

### 7.5.1 **Palaeontological Aspect**

The Bushveld Complex is a massive body of igneous origin and it is intrusive in the Transvaal Supergroup (Kent, 1980). The Bushveld Complex extends over 440 km east-west, from Burgersfort to Nietverdiend; and for nearly 350 km north-south from Villa Nora to Bethal. It covers an area of 65 000 km² and is chrome and platinum rich (Visser, 1989). The age is Vaalian (2,100 – 1,920 Ma). The layered rocks of the Bushveld Complex are generally believed to be the result of crystals settling out of magma during slow cooling. The magmatic events petrogenetically related to and generally considered part of the whole magmatic evolution of the Complex are, the diabase sills and the Rooiberg Group. The Complex consists of three main units or suites of which the Rustenburg Layered Suite is one (Kent, 1980), the other two are the Rashoop Granophyre Suite and Lebowa Granite Suite (Visser, 1989). The region will be covered by 'Bushveld' vegetation. The weathering product is known as 'black turf' (Kent, 1980; Visser, 1989). There is a presence of mining past and present with iron ore and the Merensky Reef. Magnesite mines provide magnesium carbonate for making heat-resistant bricks (Norman and Whitfield 2006). The Layered Suite is the source of an immense wealth of platinum, chrome and vanadium, and comprises six quite distinct zones.

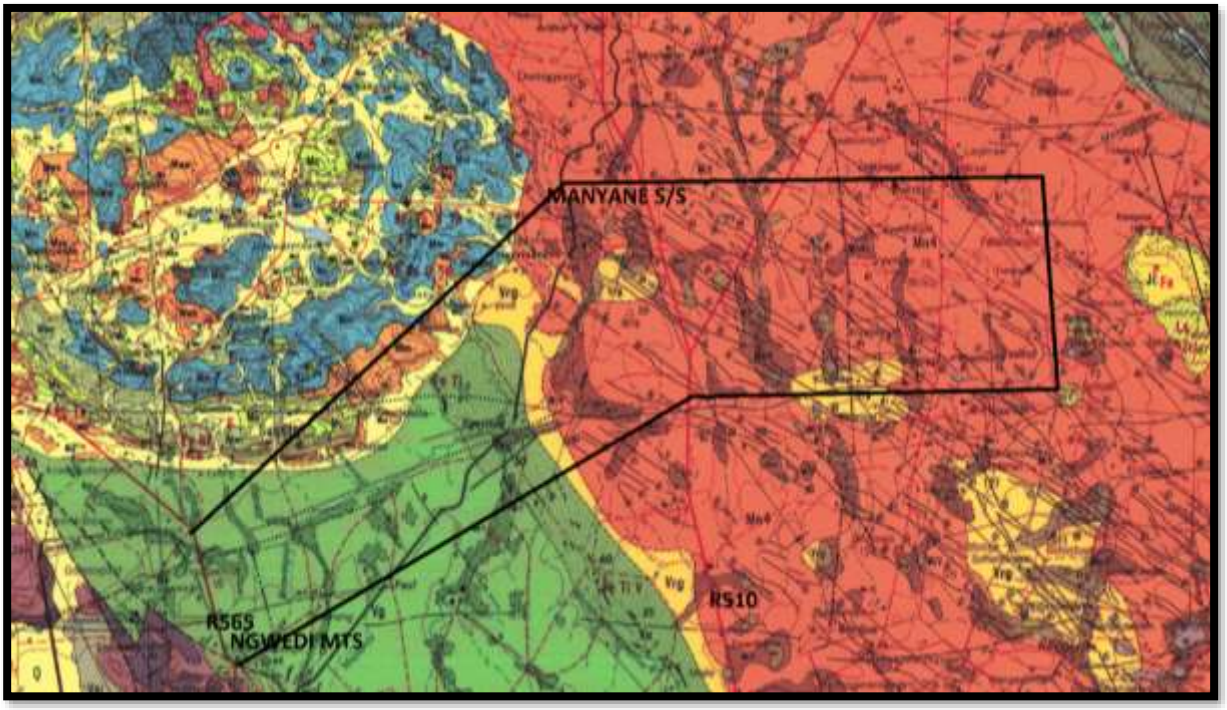



**Figure 29:** Geology of area (1:250 000 2526 Rustenburg).

## 7.6 Visual Characteristics of the area

The study area traverses two vegetation types namely the Central Sandy Bushveld and Zeerust Thornveld (National vegetation types from Vegetation map for South Africa, Lesotho and Swaziland (2018)). To the untrained eye, these two vegetation types appear similar, but subtle differences occur in vegetation species composition which is typically a result of soil differences. The Pilanesberg Mountain Bushveld vegetation type occurs inside the Pilanesberg Nature Reserve, and although not directly affected, does fall inside the study area.

Dense to open bushveld, consisting mostly of Acacia trees and shrubs, are found across most of the study area. Drainage lines and rivers are distinguished by denser vegetation which is more suited to the moist environment. Most of the study area is zoned agricultural, used for livestock grazing. No commercial or intense farming activity is noticed inside the study area with the exception of irrigated farmland below the Vaalkop Dam wall.

The study area consists of a diverse set of land uses ranging from agriculture, conservation, mining, industrial and residential. Agriculture occupies most of the study area and is typically recognised by a homogenous vegetation cover across the plains, which represents the natural vegetation type, although some transformation has occurred. The farm portions are sometimes fenced, but large tracts of land are unfenced where cattle can roam freely.

Mining is limited to the southwestern portion of the study area, closest to the Western Limb Bushveld Complex which is further south of the study area. The shafts and beneficiation plants are evident near the Ngwedi Substation. These tall structures, tower above the plains.

The two major reserves in the study area are the Pilanesberg- and the Vaalkop Dam Nature Reserves. These two have very different characteristics with the Pilanesberg Nature Reserve encompassing the Pilanesberg Alkaline Ring Complex which consist of the unique circular mountains, and the Vaalkop Dam Nature Reserve, located around the Vaalkop Dam, which is in a shallow basin, among the evenly shaped plains.

Tourism facilities are mostly concentrated along the perimeter of the Pilanesberg- and Vaalkop Dam Nature Reserves. The most famous of these is the Sun City Resort, nestled inside the first set of hills on the southern tip of the Pilanesberg Nature Reserve. Other noteworthy resorts and lodges include but are not limited to the Kingdom Resort, across from the Predator World, Manyane Resort and Finfoot Lake Reserve.

Residential developments and villages are scattered across parts of the study area. Most are situated near and around the proposed SEZ and near Sun City. Mogwase are directly adjacent to the SEZ with Mabele-a-Podi situated further west. To the north of the SEZ, the towns of Doringpoort, and Sandfontein can be found. West of Sun City is the settlement of Ledig and to the south Chaneng and Frischgewaagd. Smaller villages such as Kopman, Mannakoato-A and Maile are further south of the SEZ.

The Bodirelo Industrial area falls within the proposed SEZ and is a small industrial area with factory and shed structures. Structures seldom exceed 2 storeys and are confined within a fenced area.

The study area can be divided into several land use categories with associated landscape characters. To simplify the characterisation, broader groupings of similar land uses are made. The area around the proposed pipeline, from the Vaalkop Dam to the SEZ, including the area south of the SEZ along the proposed powerline to the point it reaches the Predator World, is considered the natural-farmland landscape. This area is characterised by the predominantly intact natural vegetation and the livestock farming.

The next landscape category is the mixed development area around the proposed SEZ. This area is recognised for the combination of residential, commercial and industrial development. The mixed development area is fractured and sprawled out with large tracts of undeveloped land in between, and gives the impression of a low-density development with rural characteristics. Buildings are considered modest and seldom exceeds two storeys.

The third landscape category is the Pilanesberg Reserve. The mountains are ever present and form a prominent backdrop to the study area. Although the Pilanesberg Reserve is not directly impacted by the proposed project, views towards Pilanesberg are considered high quality and will be affected. The powerline route passes near the foot of the mountains along the R556 and views from the road, tourist facilities and residential areas, may be impacted.

## 7.7 Key sources of air pollution surrounding the project site

The project area falls within the Waterberg-Bojanala Air Quality Priority Area. The land use immediately surrounding the project site consists predominantly of grassland and temporary cultivated land use types, with few urban built-up areas and exposed areas occupying part of the land-use in surrounding areas within a 20km radius. The larger area surrounding the project site is characterised as rural in nature. Existing key sources of air pollution surrounding the project site mostly include:

- Vehicle dust entrainment on nearby unpaved roads (mainly west, south and northeast of project site);
- Wind erosion from open exposed areas (i.e. natural eroded areas in surrounding areas);
- Vehicle exhaust emissions from vehicle activity on nearby roads;
- The existing Bodirelo Industrial Park, located in the north-eastern section of the proposed Mogwase SEZ; and
- Existing landfilling and WWTP activities within the proposed Mogwase SEZ, which include the Mogwase Landfill site.

Other sources may also include temporary, small scale agricultural activities (south-west and north-northwest of project site) and domestic fuel combustion in nearby informal settlements. However, the contribution of these sources to air pollution in the area is considered minor when compared to the key sources mentioned above
MM5 modelled meteorological data (obtained from Lakes Environmental) for the project area for the period January 2019 to December 2021 was used for input into the dispersion model. Based on the prevailing wind fields for the period January 2019 to December 2021, emissions from operations at the existing and proposed landfill sites and WWTPs located within the proposed Mogwase SEZ will likely be transported towards the west, west-northwest and west-southwest. However, slightly higher topographical features located west of the project site will also influence the dispersion of emissions impacting on nearby areas located east of the site.

The existing air quality situation is usually evaluated using available monitoring data from permanent ambient air quality monitoring stations (AQMSs) operated near the project site (i.e. within a 10km radius). There was no data available (that could be determined) to present background concentrations for the variety of pollutants assessed in this AQIAr (specifically with reference to HAPs associated with existing and proposed landfill gas and WWTP emissions). Furthermore, there is no existing air quality odour monitoring data available for the existing sites.

## 7.8 Social Characteristics of the Study Area and Surrounds

The SEZ falls under the jurisdiction of the MKLM. A portion of the Bulk Infrastructure (Electrical & Water Pipeline) falls within the Rustenburg & Madibeng Local Municipalities. The feasibility study for the BSEZ is completed and the NWDC now knows what infrastructure is required. Efforts are currently being focused on financing the infrastructure. The DTI will finance construction of the buildings. The first stage of the development, which is the refurbishment of existing buildings, has started. An NWDC Project Steering committee has been formed, and all required utilities are represented there. Government is coordinating the delivery of infrastructure by following the district development model. DBSA will lead the procurement process, and it will support emerging contractors. The BSEZ has a Community Liaison Officer to facilitate communications with stakeholders. Examples of successful SEZs are Coega, Dube Tradeport, and the East London SEZ. The Coega SEZ will partner with the Bojanala SEZ over 18 months to share learnings for its policy and process.

**Increasing Regional Employment**

The population growth in the MKLM was estimated as low (0.93%) in the 10-year period 2011 to 2021, similar to the growth in Moretele LM (0.84%). This is in sharp contrast to the growth rate in Rustenburg LM (50.60%) and in the Kgetleng Rivier LM (41.05%) in the same period. For the Bojanala Platinum DM (BPDM) as a whole in the 10-year period between 2008 and 2018 the average population growths per annum was 2.64%, slightly higher than

in the province (1.97%), and approximately double that of South Africa (1.61%). The BPDM was the most populous DM in the North West province in 2018, accounting for 44.5% of the population of the province.
In MKLM, the proportion of people aged between 15 and 29 years of age has decreased since 2011. There were however more people aged 35 onwards in 2021, compared to 2011. According to the MKLM IDP, approximately 60% of the population was in the economically active age group. In BPDM in 2018, 25.5% of the population was aged 0 to 14 years, and 30.9% were young working-age people between 20 and 34 years – representing future workforce age groups.

The MKLM IDP places the unemployment rate in the local municipal area at 24%, while the BPDM IDP states that the unemployment rate in the district is 27.6%. The Quarterly Labour Force Survey for Quarter 2: 2022 (Statistics South Africa, 2022) shows an official unemployment rate of 32.2% for the North West province for April–June 2022; this figure increases to 49.2% if discouraged workers are considered in the expanded definition of employment. In 2018, 47.89% of the total Economically Active Population of the North-West Province resided in the BPDM. According the MKLM IDP, most households reported low levels of income. Approximately 30.6% of the residents received no income, and another 22.2% of residents earned between R 8 590 and R 17 177 per annum, or between R 716 and R 1 431 per month. The employment that the SEZ development will create, therefore, will beneficially impact households in this region.
In 2018, 30.93% of the people without schooling in the province were resident in the BPDM. Additionally, 52.49% of the total numbers of people with matric in the province were residents in BPDM. Of those with matric and a postgraduate degree in the province, 39.83% were living in the BPDM. The BPDM therefore is the district with a high, if not the highest, proportion of matriculants and postgraduates in the province. There is therefore a pool of educated individuals whose capacity can be built on to support development of the SEZ.

**Progressing Regional Economic Growth**
During 2001–2004 the average annual GDP growth rate of BPDM was 5%, higher than both South Africa (3.3%) and the North West Province (3.2%). In 2008, the GDP for the district contributed towards 52.4% of the Provincial GDP and 3.4% of the total national GDP. In the period 2013–2018, however, the average annual growth in GDP for North West and BPDM was erratic, fluctuating between 9.4% to -6.3%. This trend was projected to continue in the period 2018 to 2022. The SEZ therefore can contribute towards a more stable and ideally an upward trajectory in economic growth in the BPDM.

For the period 2013 and 2017, the greatest contributor to district GDP was the mining sector (at least 50%) and the smallest contributor was agriculture (approximately 1.0%). Other significant contributors were community services (approximately 12.5%), financial services (approximately 10.3%), and trade (approximately 9.5%). While BPDM has a comparative advantage in the mining sector in the province all other sectors are viewed as underdeveloped and not competitive. The SEZ aims to leverage the strong presence of the mining sector and increase the value its products through beneficiation, thus increasing GDP contribution. The district hosts the two largest platinum-producing mines, and other minerals found in the BPDM include tin, chrome, granite, lead, and slate. Similarly, agricultural products can be turned into more valuable products and thus contribute towards a higher GDP in the BPDM. Other economic sectors active in the BPDM, in order from highest to lowest contributions to the district GDP are manufacturing, transport, electricity, and construction.

The largest employer in the BPDM is mining, which accounts for more than 50% of employment. Although the agriculture sector contributes approximately 2.6% to the GDP in the region, it accounts for 19% formal employment within the district. Both these primary sectors are labour intensive and require low skill levels, which are readily available in the district. Apart from a well-developed commercial sector, small scale agriculture is also practised as subsistence farming in communal areas in the district. The SEZ plans to transform parts of the mining and agricultural economy by improving skills in the area to produce more highly valued goods.
The mines in the district also source goods and services from local SMMEs, such as brick making, gearbox repairs, general repairs, welding, office cleaning, catering, dry cleaning and laundry services. Chemicals, mining timber, iron and steel products, explosives, electrical machinery, cables and wiring, and foodstuffs are sourced from outside the North West, resulting in huge losses of potential income in the region. The Bojanala SEZ aims to develop SMMEs in the region to increase their share of trade with mines and other industries in the area.

**Decreased quality of Life**

In SIA consultations, community members from the surrounding Mogwase Township pointed out that even before 1994; there was environmental pollution from industries in the area. For example, there was ink in the rivers, and air pollution from mines. The community has been negatively impacted over the years from some businesses operating in the area that were not environmentally compliant. They also voiced their disappointment at the state of infrastructure in their areas, saying that one would think there are no mines in the area to invest in their community. There had experienced a large influx of job seekers into the area, from all over South Africa. They also said that because of representation from the large tribal community local municipality council decisions often benefit tribal areas, and those outside of tribal areas do not get as much attention. Their view was that infrastructure is being built for the SEZ, but it also needs to support townships as well. There were also concerns about crime in the area affecting infrastructure, that is, cables were being stolen. Both the community and businesses consulted highlighted the shortage of homes, and rising costs of house prices in the area. People have constructed backrooms and these provide an income for households. There were concerns that there will be many contractors in the area, and they will set up illegal structures, which they will use to extend their stay in the area, instead of returning after construction activities are completed.

According to the IDP (MKLM, 2021) the MKLM is a water-scarce municipality that lacks bulk water supply, and system augmentation and maintenance as revenues are not sufficient. Relief is expected in Mogwase when a 10Ml/d reservoir will be constructed; however, water quality problems issues due to aged infrastructure and other issues will still need to be addressed. Moreover, access to basic sanitation is a major challenge in the MKLM, as waterborne sewage services 8% of the all households (mainly in Mogwase and Madikwe) and there is a sanitation backlog of 60%.

As per the District Health Barometer (Health Systems Trust, 2020) the broad cause and leading causes of death in BPDM for the period 2012–2017 for males aged 15 to 24 were injuries, including road accidents (58%), non-communicable diseases (17%), and HIV/AIDs and Tuberculosis (12%) and for males aged 25 to 64, these percentages were 18%, 36% and 31%, respectively. For women aged 15 to 24, the percentages were 21%, 21% and 36%, and for women aged 25 to 64, they were 6%, 45% and 31%. For women in the former category it was 22%, and in the latter category it was 18%. Communicable diseases together with maternal, perinatal and nutritional conditions were also a significant cause for age groups <5 years and aged 5 to 14 years, where these

percentages were 75% and 28%, respectively, for males, and 74% and 33% for females. There are 48 fixed primary health care facilities in the MKLM sub-district, which unfortunately are aged, in disrepair and lack equipment. The Siyanda Bakgatlha Platinum Mine is assisting with upgrading of facilities and procurement of medical equipment.

**Social and Economic Displacement**

All of the land that the bulk water pipeline will traverse is owned by Magalies Water and Government Public Works, except for a portion that runs adjacent to privately-owned land (see Figure 3). The pipeline will be lain alongside the roads for virtually its entire length from the time it exits the Magalies Water property until it enters the SEZ site. The only disruption that is expected therefore will be as the pipes are layed along minor roads, and approximately 4 km along the regional road R510 just before it enters the SEZ site.

The Eskom transmission line proposed for exiting Ngwedi MTS will along most its length traverse land owned by Magalies Water Board, Government Pubic Works, Aqua Terra PTY (LTD), the M & M family Trust, and the MLKM. It will potentially disrupt road traffic along 8 km of the regional road R556, including the approach to Sun City Resort and Pilanesberg National Park, major tourism attractions in the areas. Along its path, the transmission lines will be erected approximately 1 km away from the Pilanesberg international airport, and inside Predator World, another tourism attraction in the area. Both these developments are located on private land belonging to Aqua Terra PTY (LTD). For approximately 2.5 km the line traverses land belonging to the MKLM that appears to be prepared or used for farming. Most of the transmission line will be erected alongside minor roads.

The Eskom transmission line exiting from the Manyane substation is approximately 1 km in length. The only infrastructure it will cross over is a railway line in Mogwase Township, and possibly a minor road, before entering the SEZ site.

The proposed Mogwase SEZ, including associated landfill sites and WWTPs are located in the eastern part of Mogwase to the south-east of the residential township Mogwase Unit 5, in the Moses Kotane Local Municipality, within the North-West Province. The Vaalkop Dam and the resultant perennial tributary run south of the proposed SEZ sites, while the The Bodirelo industrial township forms the northern boundary of the proposed SEZ. The project area falls within the Waterberg-Bojanala Air Quality Priority Area. The land use immediately surrounding the project site consists predominantly of grassland and temporary cultivated land use types, with few urban built-up areas and exposed areas occupying part of the land-use in surrounding areas within a 20km radius. The larger area surrounding the project site is characterised as rural in nature. Existing key sources of air pollution surrounding the project site mostly include:

- Vehicle dust entrainment on nearby unpaved roads (mainly west, south and northeast of project site);
- Wind erosion from open exposed areas (i.e. natural eroded areas in surrounding areas);
- Vehicle exhaust emissions from vehicle activity on nearby roads;
- The existing Bodirelo Industrial Park, located in the north-eastern section of the proposed Mogwase SEZ; and
- Existing landfilling and WWTP activities within the proposed Mogwase SEZ, which include the Mogwase Landfill site.

Other sources may also include temporary, small scale agricultural activities (south-west and north-northwest of project site) and domestic fuel combustion in nearby informal settlements. However, the contribution of these sources to air pollution in the area is considered minor when compared to the key sources mentioned above.
MM5 modelled meteorological data (obtained from Lakes Environmental) for the project area for the period January 2019 to December 2021 was used for input into the dispersion model. Based on the prevailing wind fields for the period January 2019 to December 2021, emissions from operations at the existing and proposed landfill sites and WWTPs located within the proposed Mogwase SEZ will likely be transported towards the west, west-northwest and west-southwest. However, slightly higher topographical features located west of the project site will also influence the dispersion of emissions impacting on nearby areas located east of the site.

The existing air quality situation is usually evaluated using available monitoring data from permanent ambient air quality monitoring stations (AQMSs) operated near the project site (i.e. within a 10km radius). There was no data available (that could be determined) to present background concentrations for the variety of pollutants assessed in this AQIAr (specifically with reference to HAPs associated with existing and proposed landfill gas and WWTP emissions). Furthermore, there is no existing air quality odour monitoring data available for the existing sites.

# 8 IDENTIFICATION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

In terms of APPENDIX 3(3)(1) of the EIA Regulations (2014) (as amended 2017), an Environmental Impact Assessment Report must include –
**(k) A summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.**

The activities that are associated with the construction, maintenance and operation of the proposed project, which could potentially have an impact on the environment, are also highlighted in this section. In addition, the Department of Environmental Affairs guide on assessing cumulative effects describes that it is not practical to analyse the cumulative effects of an action on every environmental receptor. Therefore, for cumulative effects analysis to help the decision-maker and inform interested and affected parties, it must be limited to effects that can be evaluated meaningfully. This chapter will highlight potential impacts and issues that can be evaluated.

## 8.1 Specialist assessments identified

### 8.1.1 Screening Report

Based on the selected classification shown in Appendix G2 (screening report) and the environmental sensitivities of the proposed development footprint, the following specialist assessments have been identified for inclusion in the assessment report (see **Table 10**).

**Table 10:** Specialist assessments identified by the screening tool

| No: | Theme | Has this been undertaken? Yes ✔ /No (**X**) | Reference |
|---|---|---|---|
| **1** | Landscape/Visual Impact Assessment | ✔ | Appendix E7 |
| **2** | Archaeological and Cultural Heritage Impact Assessment | ✔ | Appendix E5 |
| **3** | Palaeontology Impact Assessment | ✔ | Appendix E6 |
| **4** | Terrestrial Biodiversity Impact Assessment | ✔ | Appendix E2: |
| **5** | Aquatic Biodiversity Impact Assessment | ✔ | Appendix E1 |
| **6** | Hydrology Assessment | ✔ | Appendix G4 |
| **7** | Socio-Economic Assessment | ✔ | Appendix E8 |
| **8** | Plant Species Assessment | ✔ | Appendix E2: |
| **9** | Animal Species Assessment | ✔ | Appendix E3 |

### 8.1.2 Additional specialist studies identified

Another important element of the scoping process was to evaluate the issues that were raised during the Public Participation Process (PPP) and technical processes and ensure that those identified as key issues are included within the scope of the EIA process. To fully address and assess some of the issues raised throughout this process, the following additional specialist were identified:

- Air Quality Impact Assessment Appendix E9:

- Avifauna Impact assessment Appendix E4

## 8.2 Water Resources of the study area

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E1** – Aquatic and Wetland Impact Assessment Report for more details).

### 8.2.1 Results of the Aquatic Assessment

**Wetland Classification and Delineation**

i. **The Proposed SEZ:** Several watercourses were identified in the proposed SEZ. These include a 4th order perennial river known as the Mogwase River and sever smaller Non-perennial streams of 1st and 2nd order that flows into the Mogwase River before it flows into the Elands River to the south. Additionally, another non-perennial episodic stream is found in the south-eastern section of the SEZ and drains directly into the Elands River. It should be noted that two of the non-perennial streams that flow into the Mogwase River have some elements similar to wetlands that is sections with no channel and slow flow, as well as an absence of woody vegetation replaced with wetland vegetation. These areas are thought to have these wetland features due to anthropogenic changes in hydrology, geomorphology and vegetation of these units.

**The watercourses associated with the SEZ** as well as the calculated buffer zones include (**Figure 30**):

- Perennial River (Mogwase River) – 54 m
- 2 Non-Perennial with Wetland Features – 54 m
- 2 Non-Perennial Episodic Stream (South Western Section)– 23 m
- 2 Non-Perennial Episodic Streams (South Eastern Section) – 54 m

The other infrastructures associated with the SEZ are associated with the following watercourses:

- 2 New storage pumps (elevated): Both these are located a sufficient from the nearest watercourse, and the footprint is expected to be small (although it was not known during the report and fieldwork). Both are expected to not have any impacts on any watercourse.
- Proposed 132 kV Line – From Proposed 132/22 kV Substation to Manyane Substation: Crosses one Perennial River (Mogwase River – 54 m buffer), also crosses an area of historical diggings that resemble wetlands, these are however due to historical disturbances in the soil profile and are not natural wetland areas.
- Water Works Treatment Plant (WWTP) Expansion - expansion is located adjacent an existing WWTP which already encroaches and impacts the adjacent watercourse (Non-Perennial with Wetland Features – 54 m buffer zone). Due to the present impacts of the existing WWTW the expansion here is suggested rather than a new area that can cause additional impacts. It is however, important to mitigate potential impacts such as spills as discussed in this report

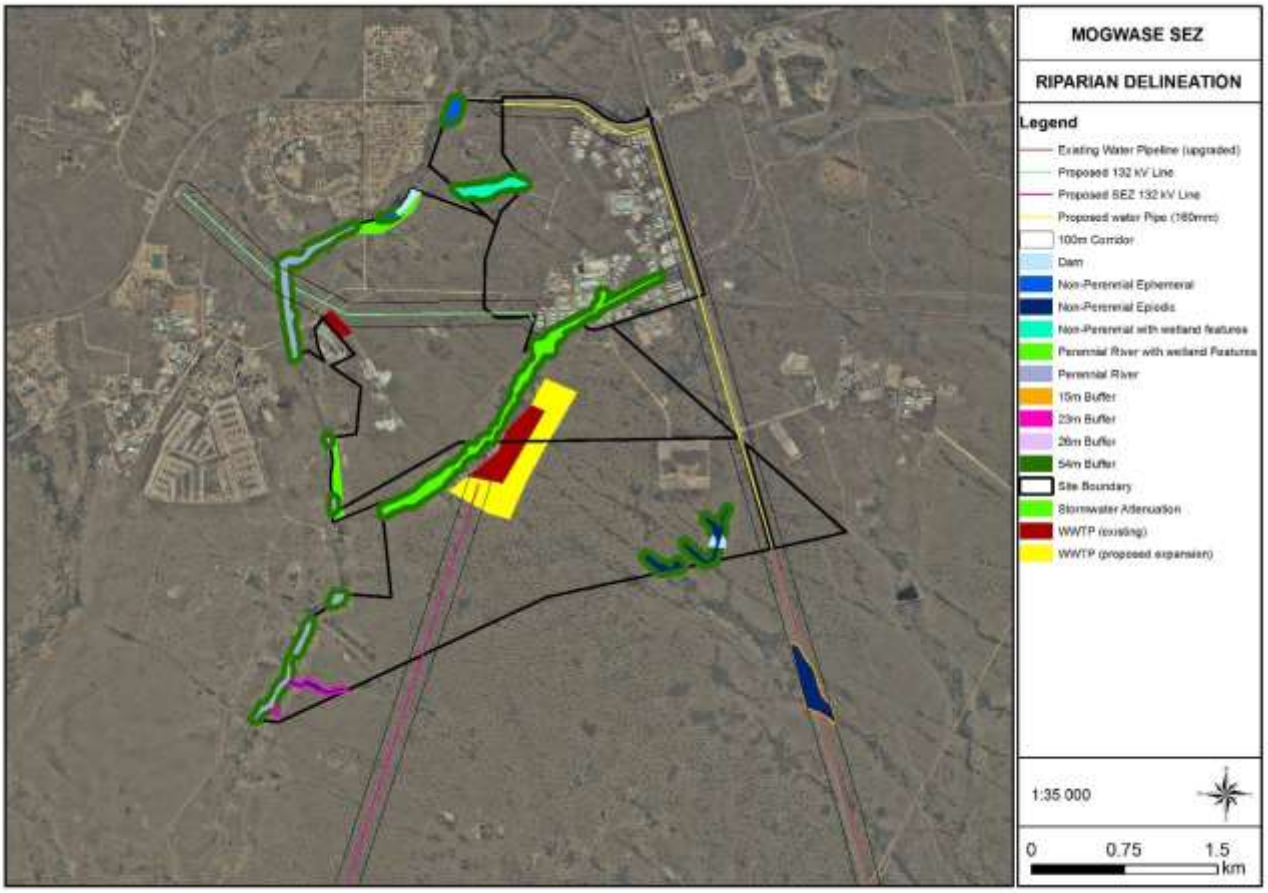



**Figure 30:** The location and extent of watercourses within the SEZ and directly surrounding proposed infrastructure.

i. **<u>The Proposed SEZ 132kV Powerline</u>**

The proposed 132 kV Eskom line starts in the centre of the SEZ at one of the Proposed 132/22 kV substations and continues west towards the Ngwedi Eskom Substation. No alternatives were identified or studied. It should be noted that the proposed powerline crosses a protected area near Pilansberg National Park and could thus be detrimental for avifaunal species in the adjacent park, as well as being a visual obstruction for the many tourists of the area. Thus, avifaunal and visual impacts studies should be included in the studies.

The proposed powerline crosses a total 16 watercourses (**Figure 31**), these include many minor rivers and streams such as Ga-Mamosadie-, Molapomotsho-, Mankwe- and Seshabele Rivers as well as the larger Elands River. The rivers and streams range from Non-Perennial Episodic, Non-Perennial Ephemeral to Perennial Rivers. All of the watercourses that cross the powerline are associated with the Elands River and ultimately drain into the Elands River. Although a large section of the powerline is within current road reserves (thereby decreasing potential risks and impacts) most of the extent is located on open land and thus prone to some impacts that should be mitigated.

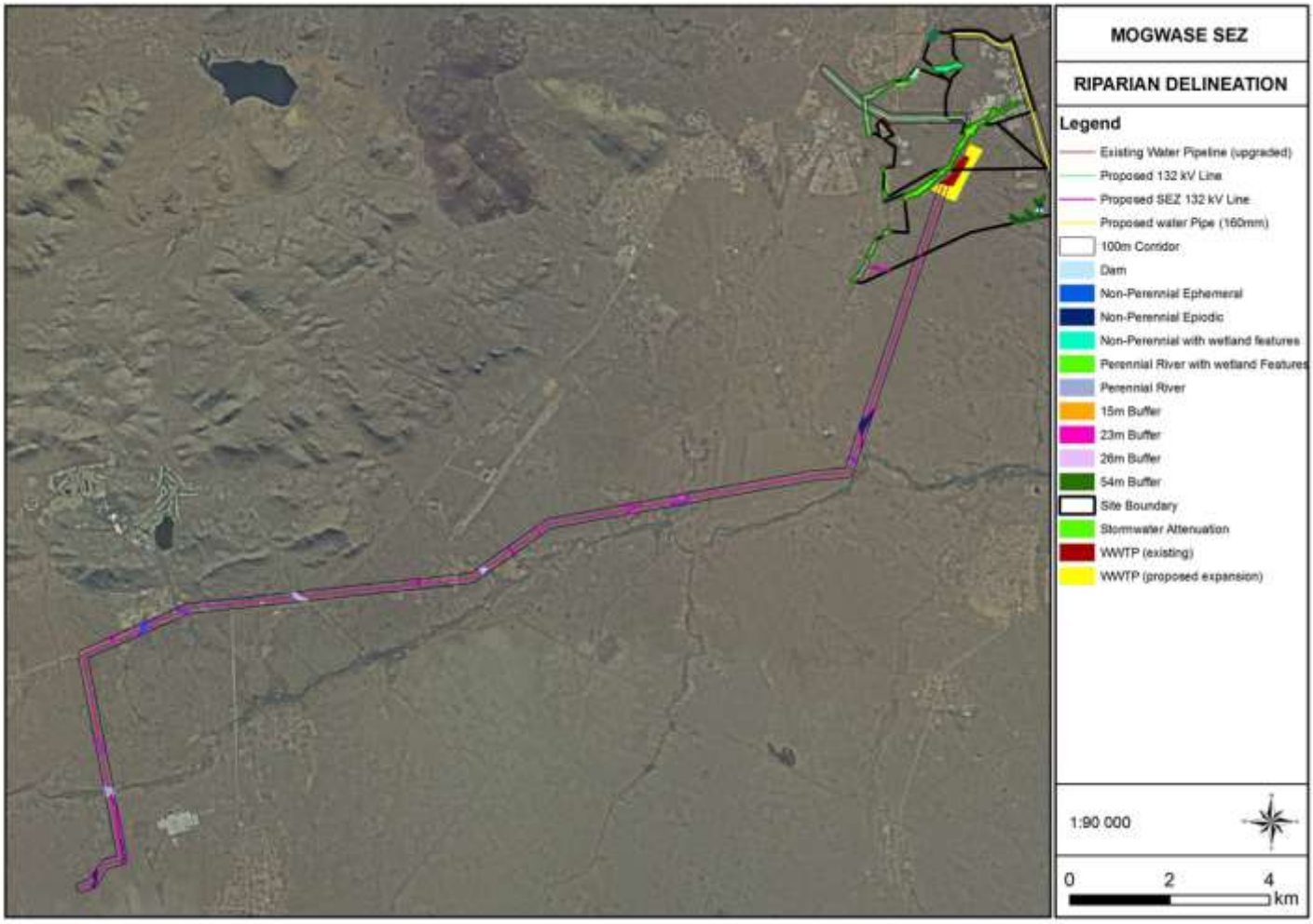



**Figure 31:** The location and extent of watercourses crossing the proposed 132kV powerline from the SEZ to Ngewdi substation.

**ii. <u>Upgrading of existing ± 28km of Bulk 200mm Diameter Supply line from Vaalkop Water Treatment Works to Bodirello Industrial Area.</u>**

The proposed upgrade of an existing water line will take place from the proposed new storage pump (elevated), within the proposed SEZ, and continue towards the Vaalkop Water Treatment Works. The pipeline follows and existing dirt road for most of the length. The existing pipeline crosses a total of 14 watercourses (wetlands are shown in **Figures 32**). The watercourses are predominantly smaller watercourses, mainly Non-Perennial Ephemeral and Episodic streams. The watercourses all drain in a southern direction into the Elands River or Vaalkop Dam directly. Because the pipeline is existing, the buffer zones for all the watercourses were calculated at 15m, because work will occur within the watercourses. It should be noted that the final section of the pipeline is located within the Vaalkop Nature Reserve. Although many remedial structures were recorded near the pipeline structures, many areas were eroded and would require additional rehabilitation measures. Furthermore, the dirt road adjacent to the pipeline has also created large erosional features at the water crossings and should ideally be remediated.

The vegetation and soil characteristics were similar in all the non-perennial streams located on the pipeline. The soil was mostly alluvial sandy soil with some areas of boulders and bedrock. The vegetation was mostly associated with terrestrial vegetation with some hydrophytic species occurring in shallow pools. **Figure 33** reflects the vegetation characteristics observed.

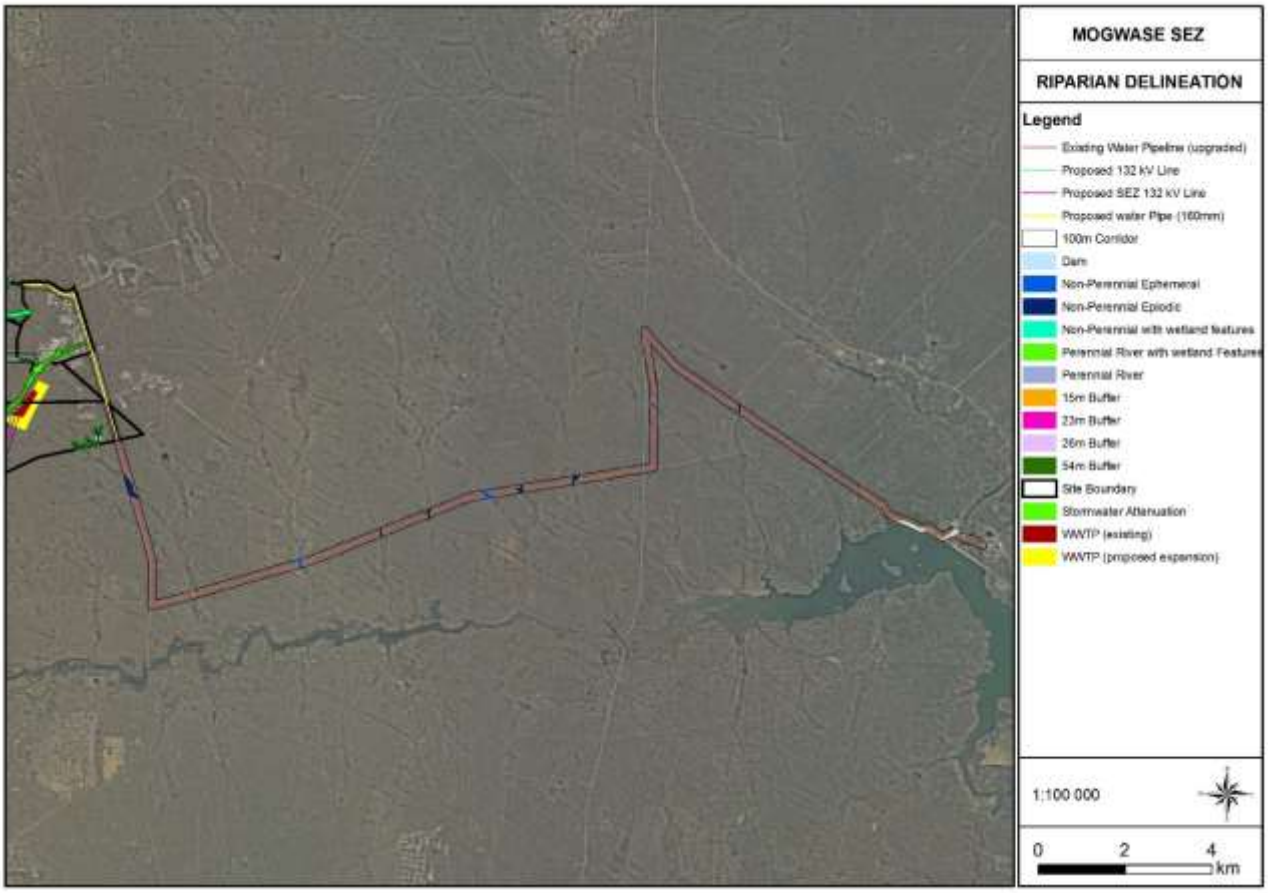



**Figure 32:** The location and extent of watercourses crossing the proposed Upgrading of existing Supply line from Vaalkop Water Treatment Works to Bodirello Industrial Area


**Figure 33:** Vegetation and soil characteristics of the watercourses associated with the upgrade of the water pipeline.

### 8.2.2 Wetland Functional Assessment

i. **Special Economic Zone:** The SEZ includes: Proposed 132/22 kV Substation – North, Proposed 132/22 kV Substation – South, Proposed water Pipe (160mm), 2 New storage pumps (elevated), Proposed 132 kV Line – From Proposed 132/22 kV Substation to Manyane Substation, WWTP Expansion (Adjacent to Existing WWTP) – Centre, WWTP Expansion (Adjacent to Existing WWTP) – South-Eastern Corner. The integrity of watercourses associated with this area are summarised in **Table 11.**

**Table 11:** Summary of the integrity of watercourse associated with the SEZ and associated infrastructure.

| Watercourse | Buffer Zone | Quick Habitat Integrity (Seaman *et al.*, 2010) | Riparian Vegetation Response Assessment Index (VEGRAI), (Kleynhans et al, 2008) | Recommended Ecological Category (REC) Rountree *et al.*, (2013) |
|---|---|---|---|---|
| Perennial River (Mogwase River) | 54 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Ephemeral River | 54 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| 2 areas of Non-Perennial With wetland features | 54 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Episodic | 54 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| 2 areas Non-Perennial Episodic | 23 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |

ii. **Proposed SEZ 132kV Powerline – From SEZ to Ngewdi Substation:** The integrity of watercourses associated with the proposed powerline is summarized in the **Table 12.**

**Table 12:** Summary of the integrity of watercourse associated with the powerline and associated infrastructure.

| **Watercourse** | **Buffer Zone** | **Quick Habitat Integrity (Seaman *et al.*, 2010)** | **Riparian Vegetation Response Assessment Index (VEGRAI), (Kleynhans et al, 2008)** | **Recommended Ecological Category (REC) Rountree *et al.*, (2013)** |
|---|---|---|---|---|
| Non-Perennial Episodic | 23 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Episodic | 23 m | C | B/C | Remain at C |
| | | Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | |
| Perennial River (Elands River) | 26 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Ephemeral | 23 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Episodic | 23 m | D | C/D | Remain at D |
| | | Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | |
| Non-Perennial Ephemeral | 23 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |
| Non-Perennial Ephemeral | 23 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Perennial River (Molapomotsho River) | 26 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 23 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |
| Non-Perennial Episodic | 23 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |
| Non-Perennial Episodic | 23 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 23 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |
| Non-Perennial Ephemeral | 23 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Ephemeral | 23 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Ephemeral | 23 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |

iii. **Upgrading of existing ± 28km of Bulk 200mm Diameter Supply line from Vaalkop Water Treatment Works to Bodirello Industrial Area:** The watercourses associated with the proposed water pipeline upgrade are summarized in the **Table 13.**

**Table 13:** Summary of the watercourses associated with the proposed upgrade of a water pipeline.

| Watercourse | Buffer Zone | Quick Habitat Integrity (Seaman *et al.*, 2010) | Riparian Vegetation Response Assessment Index (VEGRAI), (Kleynhans et al, 2008) | Recommended Ecological Category (REC) Rountree *et al.*, (2013) |
|---|---|---|---|---|
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Ephemeral | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Ephemeral | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | C - Moderately modified. Loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. | | Remain at C |
| Non-Perennial Ephemeral | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Non-Perennial Episodic | 15 m | D - Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred. | | Remain at D |
| Non-Perennial Episodic | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |
| Area associated with dam edge | 15 m | B - Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged. | | Remain at B |

## Site Ecological Importance

Based on the Species Environmental Assessment Guideline (SANBI, 2020) watercourses and specialised habitats should be assessed based on their Site Ecological Importance (SEI). All the watercourses examine in this report should thus be regarded as having a High Sensitivity (**Table 14**):

**Table 14:** Ecological Importance of all wetland areas recorded on the study site

| Habitat | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance | Receptor Resilience | Site Ecological Importance |
|---|---|---|---|---|---|
| All Watercourses | High – Confirmed occurrence of watercourses within the development footprint | Medium – Some historical impacts and AIS recorded | Medium – Based on CI and FI | Very Low – Watercourses are not easily restored without significant rehabilitation. Many species are dependent on functional wetland habitat. | Based on BI –Medium and RR – Very Low = High |

### 8.2.3 Summary of impacts assessed

i. **The Proposed SEZ**: Impacts around the SEZ include removal of woody species, dumping and littering, large scale pollution, including broken industrial pipelines (from the Bodirello Industrial Area) spilling directly into nearby watercourses, canalisation of watercourses, farming and water inputs from industries as well as stormwater. **Figure 34** presents some of these impacts.

**Figure 34: Impacts recorded within the SEZ.**

ii. **Proposed SEZ 132kV Powerline:** Of the 16 watercourses crossed by the proposed powerline, 15 of them drain into the Elands River and the Elands River is the 16th watercourse (**Figure 35**). Thus, it stands that any potential impacts on the smaller crossing will have an effect downstream within the Elands River. The main impacts recorded include erosion and AIS. The erosion is especially prevalent at dirt road crossings and infrastructure near these watercourses. Overgrazing within the clay watercourses has also contributed to trampling and creation of small depressions in the landscape.

**Figure 35:** Impacts recorded near the proposed powerline includes erosion, AIS and overgrazing.

ii. **Upgrading of existing Water pipeline** the main impacts are erosion caused by water pipeline structures and road crossings. Some small-scale dumping and littering were also observed. **Figure 36** shows some of these impacts.

**Figure 36**: Impacts associated with the proposed upgrade of the existing water pipeline

## 8.3 Vegetation

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E2** – Terrestrial Impact Assessment Report for more details).

### 8.3.1 Results of the vegetation Assessment

**Vegetation Types**

i. **The SEZ development site:** The vegetation on the proposed development site comprised open to closed mixed bushveld, albeit dominated by microphyllous, thorny tree species. Varying degrees of past and current disturbances were noted. The species composition was much the same throughout the site with dominance of species varying depending on the historical disturbances and soil variation (e.g., the species *Dichrostachys cinerea* dominated in historically disturbed areas, while species such as *Terminalia sericea* was only noted in deeper sands on the south-western portion of the site). Aerial imagery indicated a banded vegetation pattern on much of the site. The bands comprised denser shrubs and trees (mainly along drainage lines, moister soils, or rocky bands). Riparian vegetation was dominated by the tree *Searsia lancea* (karee), while more clayey drainage lines that were impacted by grazing and other disturbances, included a high frequency of the encroacher tree *Senegalia mellifera* subsp *detinens* (black thorn). Some moist grasslands on clay, with a low frequency of trees, were also delineated.

The vegetation on the development site was broadly grouped as follows:

1. Modified land
2. Open to closed mixed bushveld
   *2.1.* Microphyllous species dominated bushveld
   2.2. *Dichrostachys cinerea-Terminalia sericea* bushveld on deeper soils
3. Vegetation associated with watercourses
   3.1. *Searsia lancea* riparian woodland
   *3.2. Senegalia mellifera* clay drainage lines

3.3. Moist grassland in drainage lines

These vegetation groups are shortly discussed below and geographically represented in **Figure 37**. Plant species recorded in each vegetation group at the time of this assessment are listed in Appendix E2.

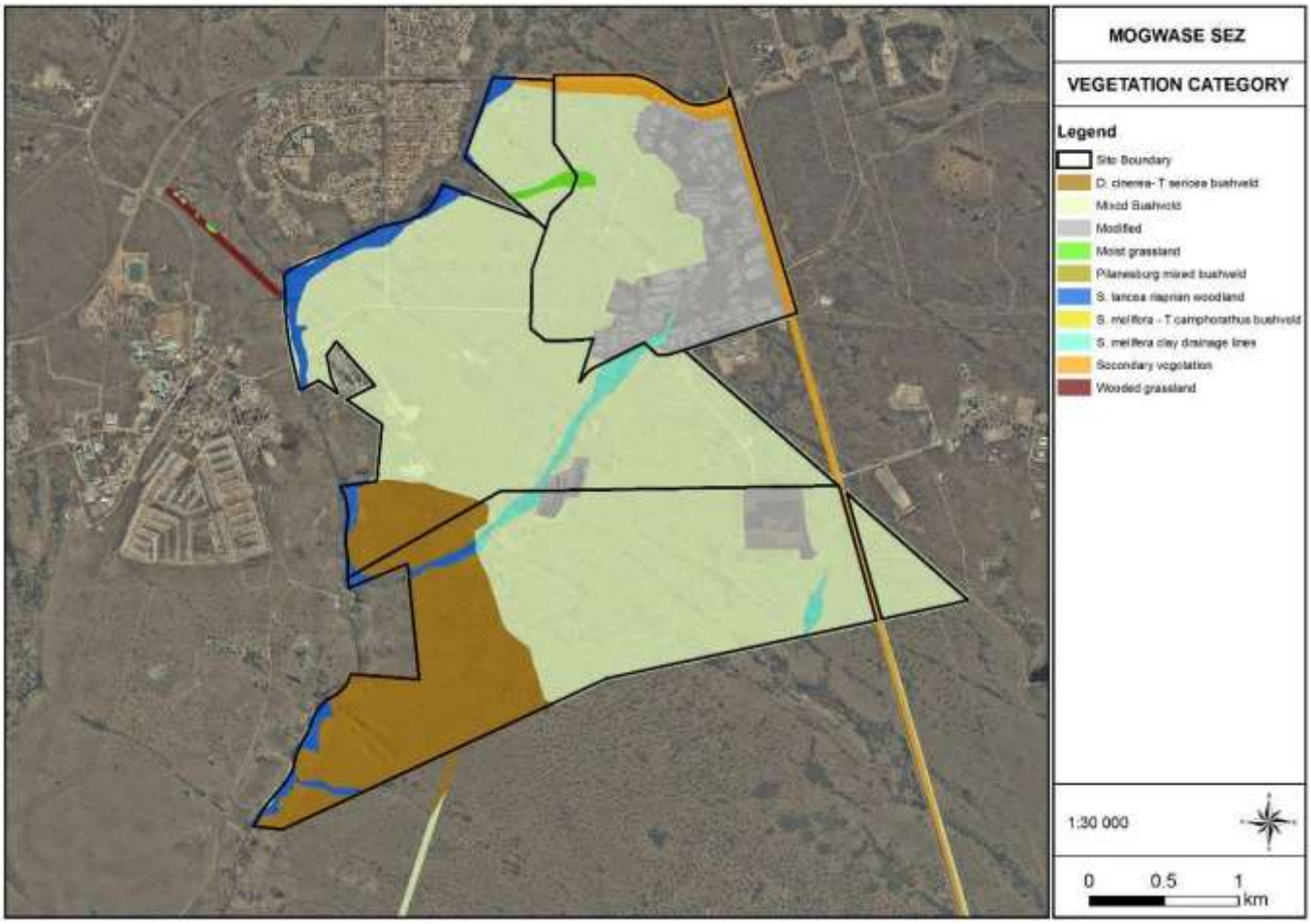



**Figure 37:** Vegetation groups within the proposed development site and 132kV powerline to Manyana substation.

ii. **Powerline routes:** The powerline routes traverse the microphyllous dominated mixed bushveld, *Searsia lancea* riparian woodland, and moist grassland as described for the development site in Section 4, with some variation. In addition, the western extent of the powerline will traverse wooded grassland, while the longer powerline route traverses the Pilanesberg National Park, *Senegalia melifera – Tarchonanthus camphoratus* dominated bushveld and secondary vegetation. The vegetation is shortly discussed below, geographically represented in Figure **38.**

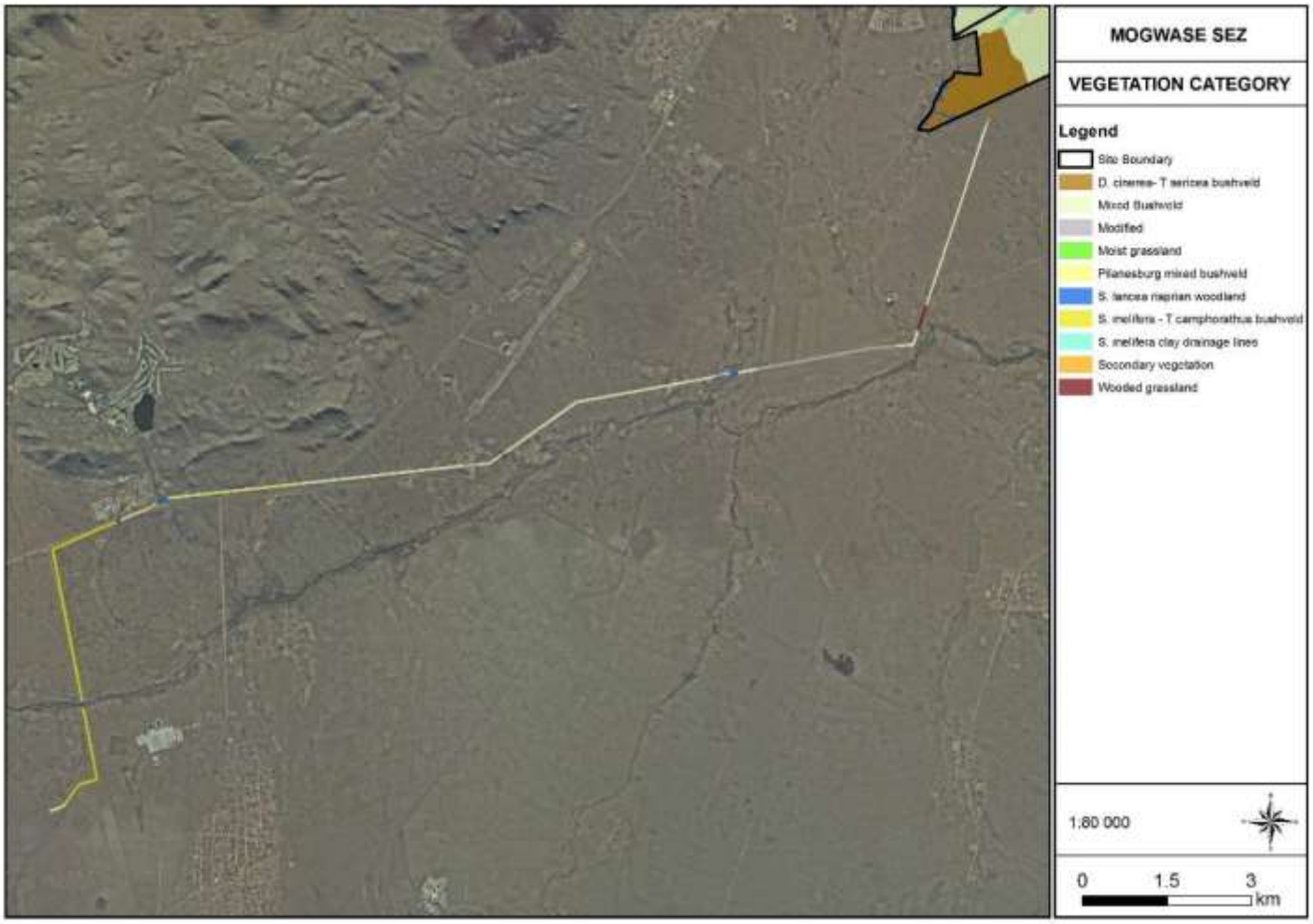



**Figure 38:** Vegetation along the 132kV powerline towards the Ngwedi Substation

iii. Pipeline Routes: The proposed 160mm pipeline, as well as the upgrade of the northern extent of the existing pipeline falls within the exisitng R510 road servitude. The servitude comprised secondary vegetation, with some large trees. The servitude of the exisitng water pipeline that stretches eastwards towards the Vaalkop Dam were degraded and comprised mainly of bare soils, eroded areas and pioneer / encroacher tree species. Beyond the servitude, the vegetation comprised mixed bushveld, dominated by the microphyllous Vachellia tortilis. The area around the Vaalkop Dam includes infrastructure and modified land. The vegetation is shortly discussed below, geographically represented in **Figure 39**.


**Figure 39:** Vegetation groups along the pipeline route to be upgraded

### 8.3.2 Site Ecological Importance / Sensitivity

The Site Ecological Importance (SEI) in terms of vegetation is discussed and mapped (**Figure 40**) as per the Species Environmental Assessment Guideline (SANBI, 2020) and detailed in the methodology section.

**Table 15:** Scoring of vegetation that occurs within the PAOI.

| Broad vegetation community | | Conservation Importance (CI) | Functional Integrity (FI) | Biodiversity Importance (BI) | Receptor Resilience (RR) | Site Ecological Importance (SEI) – mitigation |
|---|---|---|---|---|---|---|
| Modified land | | Low[1] | Very low[3] | Very-low | High⑥ | **Very-low (Minimise)** |
| Secondary vegetation | | Low[1] | Very low[3] | Very low | High⑥ | **Very-low (Minimise)** |
| Open to closed mixed bushveld | Mixed bushveld dominated by microphyllous species | Medium[2] | High④ | Medium | Medium⑦ | **Medium (Minimise & Restore)** |
| | *D cinerea-T.sericea* bushveld on deeper soils. | | | | | |
| | Pilanesburg National Park – mixed bushveld | | | | | |
| | *Senegalia melifera-Tarchonanthus camphoratus* | Low[1] | Medium⑤ | Low | Medium⑦ | **Low (Minimise & Restore)** |
| Watercourse vegetation | *Searsia lancea* riparian woodland | Medium[2] | High④ | Medium | Low⑧ | **High (Avoid & Minimise)** |
| | *Senegalia mellifera* clay drainage | | | | | |
| | Moist grasslands | | | | | |
| Wooded grassland | | Medium[2] | High④ | Medium | Medium⑦ | **Medium (Minimise & Restore** |

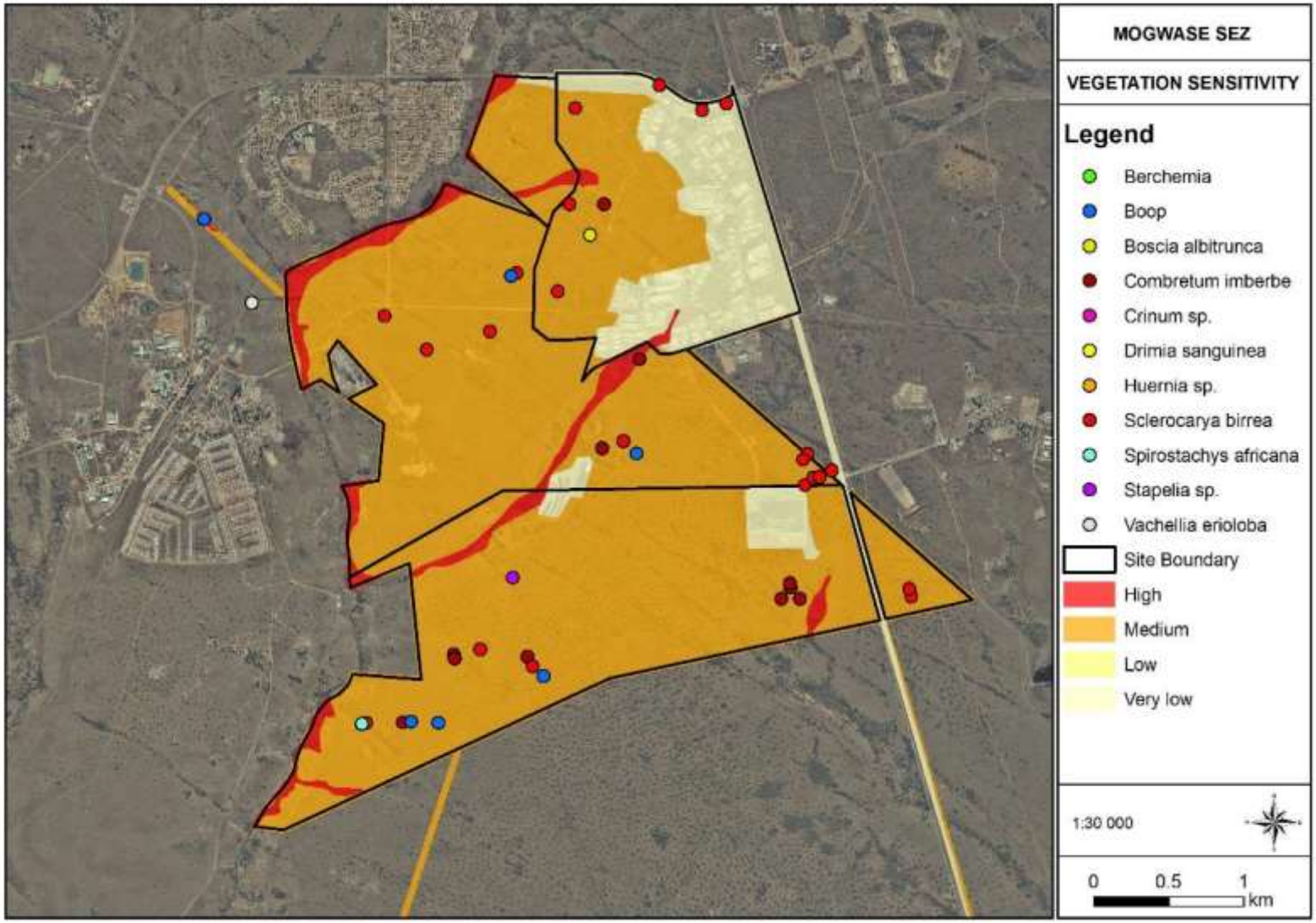



**Figure 40:** Site Ecological Sensitivity for the proposed development site, including recorded localities of protected plant species in sampled areas **(**note these localities were recorded in walked transects and more individuals are present scattered through the site **)**

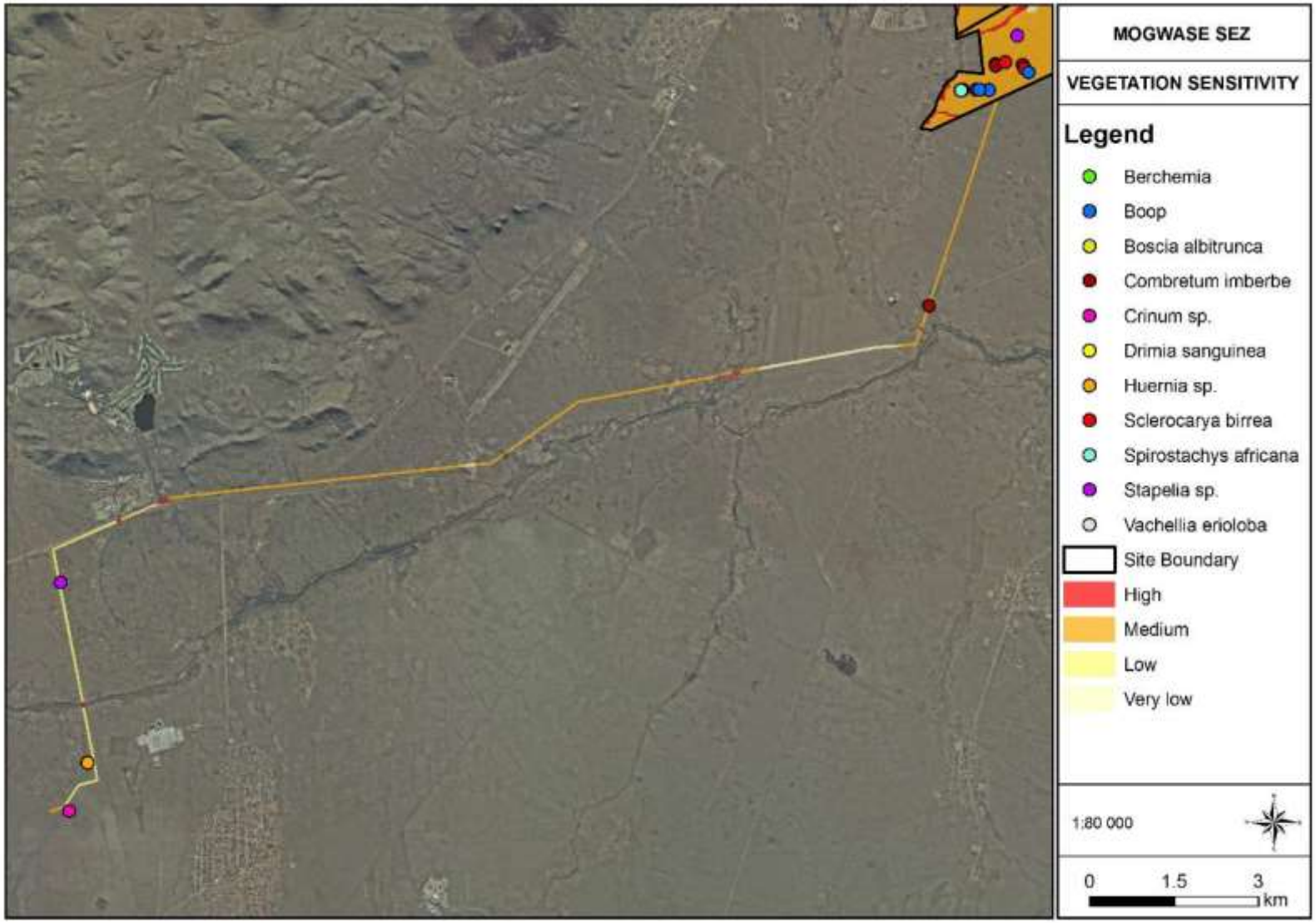



**Figure 41:** Site Ecological Sensitivity for the proposed powerline, including recorded localities of protected plant species in sampled areas

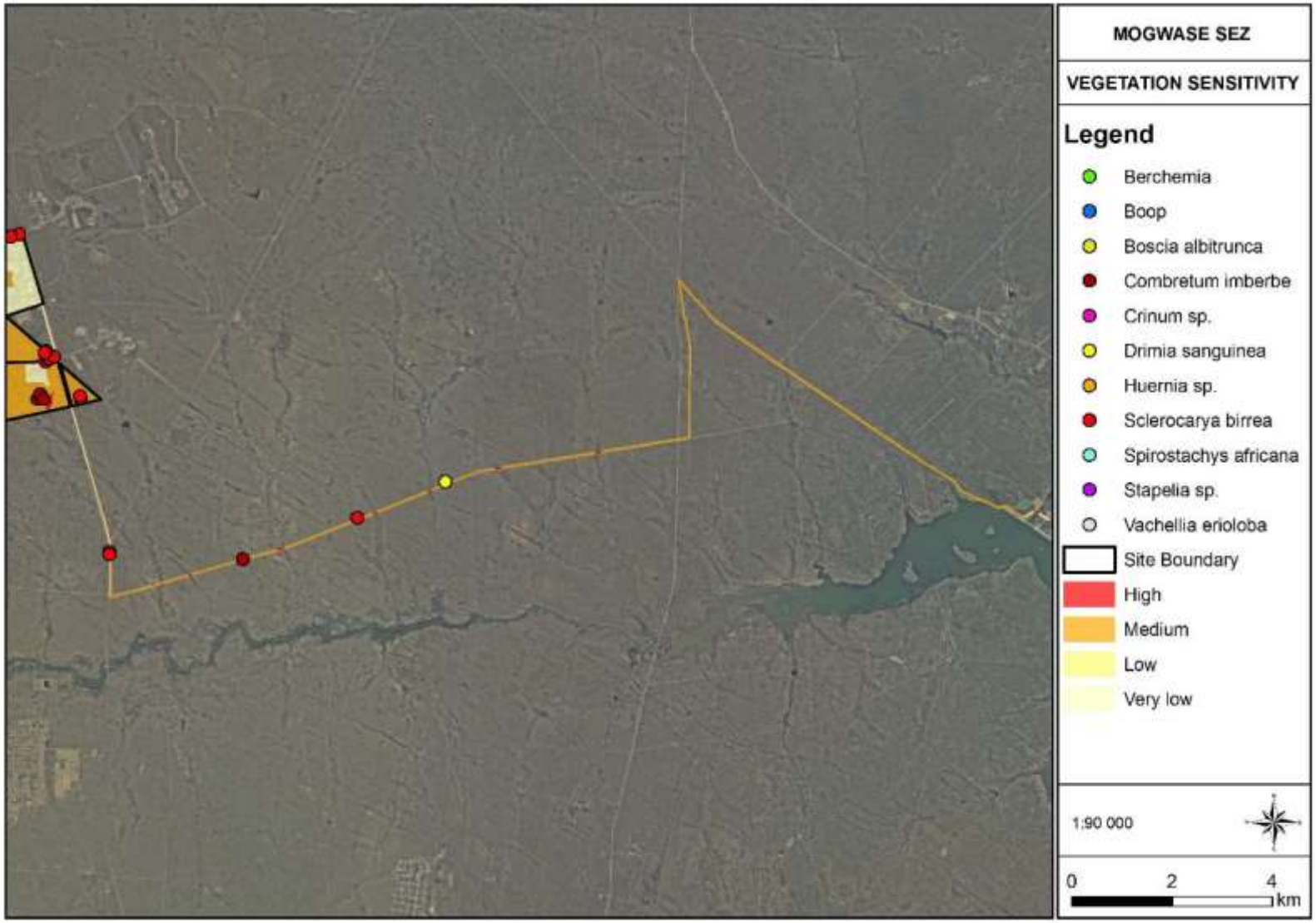



**Figure 42:** Site Ecological Sensitivity for the proposed upgrade of the pipeline, including recorded localities of protected plant species in sampled areas

The proposed development area does not fall within a listed ecosystem; however, the vegetation is largely in a natural state with some minor and limited major ecological impacts. Furthermore, the development footprint falls mostly within a CBA and some ESAs could be impacted on too. The drainage lines and ESA provides ecosystem services such as flood attenuation, nutrient cycling and connectivity.

The SEI rating tool as provided in the Species Environmental Assessment Guideline (SANBI, 2020) results in a medium sensitivity for much as the site, while watercourses were rated higher. Watercourses are protected by the National Water Act (NWA). A wetland specialist will recommend buffers around the riparian areas, drainage lines and moist grasslands.

Suitable habitat is present on the site for two (2) Near threatened plant species, which contributes to the medium SEI ratings. Several provincially protected plants, as well as national protected tree species are present throughout the development footprint.

Development activities of medium to high impact are acceptable within the medium and low sensitivity areas. Most types of development can proceed within low sensitivity with little to no impact on conservation worthy vegetation, bar protected tee species.

### 8.3.3 Summary of impacts assessed

i. **Development site:** Development on the site will destroy mixed bushveld ranging from good condition bushveld to densely encroached areas. The remaining natural vegetation on the site falls within a CBA2 and if destroyed the extent of the CBA2 will be reduced by about 900ha. Although the site falls within a CBA2, there are options for loss of some components of biodiversity in CBA2 landscapes without compromising the ability to achieve biodiversity targets (North West Department of Rural, Environment and Agricultural Development (READ), 2015).

   The Central Sandy Bushveld is not currently threatened and occurs widespread around the site. Development on the site will not significantly reduce the extent of this vegetation. However, this report recommends that wide, naturally vegetated corridors be retained around riparian areas and drainage lines (at least 200m from the edge of the river or drainage line). Naturally vegetated open spaces must be retained in the development that connects to the riparian areas and drainage lines. This will ensure that some ecological function and corridors are preserved. Also, if the Near threatened plants species for which suitable habitat is present are located during follow-up assessments, they could be conserved within these open spaces. The open spaces should be managed to prevent bush densification, tree harvesting, and degradation

ii. **Linear infrastructure: Powerline and pipeline routes:** The greatest impact of the construction of the powerlines and pipelines are the removal of vegetation where the pylons and trenches are to be placed, as well as vegetation clearing and trampling within the servitude. Clearing of vegetation could result in a direct impact on the habitat of or species of conservation concern, while indirect impacts such as soil compaction and soil erosion are highly likely. The potential impacts will be more severe in the sensitive vegetation groups (medium SEI), whereas impacts in modified land are limited to the likely invasion of disturbed soils by alien invasive plant species. If the vegetation is rehabilitated and pruned to acceptable Eskom standards, the CBA and ESA functions along the route can be maintained.

The greatest threat to the rehabilitation of the land disturbed by construction is the risk of invasive plant species that colonise the disturbed soil and spread into adjacent natural areas. Provided that no threatened species are removed or damaged without a permit, if remedial measures and monitoring are properly employed, the vegetation that will be disturbed during construction could rehabilitate well over time, and long-term impacts on vegetation could thus be minimal.

The specialist is of the opinion that the impact of the proposed linear infrastructure will be temporary, and that vegetation can be rehabilitated within 2 to 3 years post construction, provided that mitigation measures such as limited clearing and damage is implemented throughout the construction period.

## 8.4 Fauna

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E3** – Terrestrial Impact Assessment Report for more details).

### 8.4.1 Results of the Terrestrial Fauna Species Assessment

Animal Species

- No SCCs, TOP species or endemic species are confirmed for the area.
- Only 3 of the listed SCCs and one other SCC not listed in the screening report are considered in this report (all vertebrates). Two are aquatic species more likely within the riverine and aquatic habitats around et proposed servitudes. Two are bushveld species, but both are threatened by overexploitation and the anthropogenic activity on site makes them highly unlikely on site.
- An additional eight TOP species are considered in this report as species that cannot be conclusively excluded from site and are incorporated for monitoring (all vertebrates).
- Four TOP invertebrates were historically recorded for the QDGS; none were confirmed on site. The species cannot be conclusively excluded but will persist in the surrounding bushveld if present in the SEZ.
- Congregatory water birds / aquatic species are unlikely in most of the SEZ areas. Main significant aquatic habitats are the Vaalkop Dam in the pipeline upgrade servitude and the Elands River, also limited to the servitudes.
- The site is not within a significant area of faunal endemism. Vegetation groups along the pipeline route to be upgraded

The survey findings agree with the desktop ecological status given to the site as follows:

- The main ecological corridor, linking the Pilanesberg Provincial Nature Reserve and the Vaalkop Dam Nature Reserve is associated with the Elands River south of site, only marginally affected by the servitudes.
- The Mogwase River and its rocky banks on the west of the site provide unique aquatic and rocky habitats and also contributes a significant ecological corridor, although it is impacted in the north of site by development and settlements, and further south by informal settlements and existing servitudes.
- The bulk of the site and service infrastructure is within areas designated as Critical Biodiversity Areas (CBA), specifically CBA2 under the Biodiversity Sector Plan, with limited and small areas designated as Ecological Support Areas (ESAs) also intersected. The CBA features of relevance to the SEZ include the ecological corridors and unique habitat provide by the river and surrounds and the fact that sections of the SEZ are within 5km buffer zones of PAs eas and west of site.

### 8.4.2 Site Ecological Importance / Sensitivity

A cumulative SEI assessment (SANBI, 2020) has been completed, (**Table 16** and **Figure 43**). The following is motivated:

- The Nile Crocodile and Hippopotamus are not considered to utilise the riverine areas at the site (Mogwase River) for extensive periods (breeding season or more); regardless the Medium CI rank is retained for the
- riverine areas on site but is considered and over-estimation.
- CI for the bushveld on site is considered low. The SCCs that may be affiliated with bushveld habitats (both are over-exploited species) are not considered present in the area / or present in too few numbers to regard the area as a conservation area for these species due to anthropogenic activity.
- FI for the riverine areas has been maintained as High regardless of their extent and level of existing impact (grazing, established alien invasive species). As riverine systems they are afforded a degree of legal protection, provide water to fauna, form networks of ecological corridors and provide unique habitats within the largely homogeneous bushveld setting (value of heterogeneity of habitat should not be underestimated in its value to fauna biodiversity).
- FI for the bushveld areas at the site has been rated as medium. It is a vast area with mostly minor ecological impact, but there are areas that have been cleared (informal settlements, rural settlements) and areas that have been contaminated (waste dumping sites). Furthermore, it did not appear to be extensively utilised by fauna (particularly the northern half) and is considered and over-estimation.
- FI for rocky areas are considered high for the site as they are encompassed in the riverine areas.
- RR for the bushveld areas at the site has been rated as Low, although this is considered an over-estimation for areas where SCC are considered unlikely and faunal activity was already very low (areas where existing anthropogenic activity was higher and and existing fauna species are more like to persist).

**Table 16:** Site Ecological Importance (SEI) assessment

| Evaluation unit | CI | FI | BI | RR | SEI |
|---|---|---|---|---|---|
| SITE | | | | | |
| Bushveld | Low | Medium | Low | Low | Medium (Minimise & Restore) |
| Riverine habitats | Medium | High | Medium | Low | High (Avoid & Minimise) |
| Rocky habitats | Medium | High | Medium | Low | High (Avoid & Minimise) |
| Disturbed areas | Low | Low | Low | Very high | Very Low (Minimise) |
| Developed areas | Very Low | Very Low | Very Low | Very high | Very Low (Minimise) |
| SERVITUDES | | | | | |
| Bushveld | Medium | Low | Low | High | Low (Minimise & Restore) |
| Riverine habitats | Medium | High | Medium | High | Low (Minimise & Restore) |
| Rocky habitats | Medium | Medium | Medium | High | Low (Minimise & Restore) |
| Agricultural areas | Low | Low | Low | Very high | Very Low (Minimise) |
| Disturbed areas | Low | Low | Low | Very high | Very Low (Minimise) |
| Mine land | Very Low | Low | Very Low | Very high | Very Low (Minimise) |
| Developed areas | Very Low | Very Low | Very Low | Very high | Very Low (Minimise) |


**Figure 43**: Site Ecological Importance in terms of SCCs

8.4.3 Summary of impacts assessed

i. **Development site:** Site Impacts are focussed on the construction phase. Operational phase impacts such as edge effects and the utilisation of the area by people will be assessed where reasonable predictions can be made.

ii. **Powerline and pipeline routes:** The pipelines are within an existing servitude, including tar and gravel roads. The servitude is already largely cleared and devoid of vegetation or is dominated by disturbed habitats. The servitude will therefore return to its current state within 2 years (where outside the development area of the site). Such a linear development would qualify as a compliance statement as an isolated project. In terms of this, the impact statements are considered an adequate assessment and any additional management outcomes or mitigation measures are incorporated into Section 7 of this report. Powerline impacts are limited to the construction phase. The limited and short-term impact that may be caused by maintenance activity is not considered as a major impact to terrestrial fauna in the current setting. Impacts focus on the pylon construction and construction camps.

**iii. The following impacts are further assessed:**

- Loss of habitat over the development site and pylon footprints.
- Severing or impairing ecological corridors and loss of habitat connectivity.
- Attraction or exacerbation of existing fauna AIS.
- Hampering or killing of fauna, focussing on ecologically significant species.
- Contamination to land and downstream runoff and contamination.

## 8.5 Avifauna

### 8.5.1 Results of the Avifauna Assessment

i. **SEZ zones:** The field investigation allowed an examination of the various zonal areas (A-G, with the additional 'zone' H comprising riparian/wetland areas) of the proposed SEZ (as depicted in Figure 1). Although many of these areas comprise mainly natural woodland (**Figure 44**), they largely do not comprise significant avian habitat. The close proximity of these woodlands to the densely settled Mogwase housing and industrial/commercial areas has rendered them vulnerable to degradation from a wide variety of sources, including over-grazing, bush encroachment, dumping (**Figure 44**), direct disturbance, roads, etc.

**Figure 44**: General view of woodland habitat in the SEZ zone (left) and Example of solid-waste dumping in the SEZ zone (right)

**ii. Power line (132kV) from Ngwedi Substation to SEZ**

The primary area of potential concern relevant to the proposed 27 km power line linking the SEZ zone to the Ngwedi Substation is the risk of collisions by flying birds, especially Red Data species and waterbirds, with the overhead lines, perhaps especially relevant to large threatened birds present in the Pilanesberg Nature Reserve/IBA. Risk of such collisions can be mitigated by marking the lines with bird 'flappers' or spirals, as mentioned above under the SEZ zone. The field investigation found that overall, the power-line route is already traversed by various existing power lines that would run parallel and close to the proposed power line (e.g. see **Figures 45-47**). This means that no 'greenfields' power-line routing is involved. This is positive and the 'bundling' of power-line routes in this way increases the visibility of power lines to flying birds and hence reduces collision risks. It is also preferable from a broader environmental perspective.

**Figure 45:** View of the existing power-line corridor linking the SEZ zone with the Ngwedi Substation at the east end of the corridor (southern edge of the SEZ zone).

**Figure 46:** Another view of the existing power-line corridor in the middle reaches of the corridor linking the SEZ zone and Ngwedi Substation.

**Figure 47**: View of Ngwedi Substation at the western end of the power-line corridor linking the SEZ zone and the Ngwedi Substation.

The field investigation found that overall, the power-line route is already traversed by various existing power lines that would run parallel and close to the proposed power line (e.g. see **Figures 45-47**). This means that no 'greenfields' power-line routing is involved. This is positive and the 'bundling' of power-line routes in this way increases the visibility of power lines to flying birds and hence reduces collision risks. It is also preferable from a broader environmental perspective.

### iii. Upgraded bulk water pipeline Vaalkop to SEZ

Underground water pipelines are typically of far less avifaunal concern than overhead power lines due to the absence of collision and electrocution hazards to birds. Threats to bird habitats could be potential cause for concern but less so in the case of this water pipeline project which apparently comprises an upgrade of an existing pipeline route (**Figures 48-49).**

**Figure 48.** View of the existing water pipeline route which is proposed to be upgraded in the western portion of its route.

**Figure 49.** View of the existing water pipeline route which is proposed to be upgraded in the eastern portion of its route close to Vaalkop Dam.

*With the exception of the two issues discussed below, no matters of significant avifaunal concern were noted during the field examination of the proposed upgraded water pipeline route linking the SEZ zone to the Vaalkop Water Treatment Works.*

### 8.5.2 Site Sensitivity

**i. Watercourse crossings**

As mentioned above, this power line crosses 16 watercourses (Limosella Consulting 2022), particularly high-risk areas for waterbird-power line collisions as waterbirds typically fly along such drainage lines. The field investigation suggested that bird 'flappers' or spiral devices to reduce the risk of collisions with flying waterbirds should be placed at particularly vulnerable watercourse crossings. The flappers/spirals should be placed 5 m apart and extend 50 m to either side of the central co-ords identifying the middle of the watercourse crossing. The best line to attach the markers to it the upper earth line as this is the one most likely to be involved in collisions. The markers should be placed on the lines during power-line construction. The relevant watercourse crossings requiring markers are (with central co-ords provided):

- -25.332277, 27.242608 (Mogwase/Seshabele River; **Figure 50**)
- -25.339127, 27.209502 (Mankwe River)
- -25.392770, 27.094747 (Elands River; **Figure 51**)

During the field investigation it was noted at the Mogwase/Sechabele River crossing that the river had been subject to a massive sewage spill. The local land manager accompanying me at the time, Clinton Calitz, reported the matter to the appropriate authorities. The river was subject to a massive sewage spill at the time as visible in the discoloured nature of the water.

**Figure 50.** The Mogwase/Sechabele River close to the proposed power-line crossing point requiring marking with bird 'flappers'/spirals.

**Figure 51.** The Elands River at the proposed power-line crossing point requiring marking with bird 'flappers'/spirals.

### *ii.* Proximity *of power line to Sun City sewage works*

In addition, it was noted that the proposed power line will run close to (south of) and parallel to the Sun City sewage works (central point -25.360417, 27.1042903). This site likely attracts waterbirds and it would appear precautionary/prudent to also mark the stretch of line running parallel to the sewage works, i.e. the stretch of line between the following co-ords: -25.363297, 27.100619 and -25.360461, 27.107705, a distance of about 750 m (**Figure 52)**


**Figure 52.** The location of the Sun City sewage works and the proposed power line (orange line) linking the SEZ zone and Ngwedi Substation showing the stretch of line, between the two red markers, that require marking with bird 'flappers'/spirals.

### iii. Current apparent routing of the power line north of the R556

A further issue relevant to the power line is that close to its western end the proposed route is apparently north of the R556 road, whereas the other adjacent parallel existing power lines are situated south of this road. Therefore it is proposed that the power line (orange line) north of the R556 road moved to the south of the road (blue route, this re-routing is within the 100 m study corridor represented in green shading (**Figures 53 and 54**). The blue line is the Pilanesberg Nature Reserve/IBA which will also be avoided by following the blue route.


**Figure 53.** Proposed re-routing of the power line in its western portion showing the positioning of the proposed power line (orange line) north of the R556 road and moved to the south of the road (blue route. The green shading represents a 100 m corridor for power-line. The blue line is the Pilanesberg Nature Reserve/IBA.

**Figure 54:** View looking east along the R556 road showing the existing power lines routed south of this road in contrast to the proposed routing of the power line linking the SEZ zone and the Ngwedi Substation north of this road.

*It would appear preferable for the routing of the new power line to be located south of the road as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA - the current proposed routing actually impinges on the protected area boundaries at one point (**Figure 53**).*

### iv. Communal waterbird breeding colony ('heronry') at Vaalkop Water Treatment Works

A communal waterbird breeding colony was located in an artificial wetland at the Vaalkop Water Treatment Works during the field investigation on 26 November (**Figures 55 & 56**). The site, situated in two trees on a partial island, supported 149 breeding pairs of six waterbird species (**Table 17**). An additional 140 individuals of 18 waterbird species were also counted at this wetland, of which Black-winged Stilts were definitely breeding and Squacco Herons were possibly breeding (**Table 18**).


**Figure 55:** Location of the communal waterbird breeding colony at Vaalkop Water Treatment Works.

**Figure 56:** View of the communal waterbird breeding colony at Vaalkop Water Treatment Works.

**Table 17:** Details of the communal waterbirds recorded nesting at the artificial wetland at Vaalkop Water Treatment Works on 26 November 2022.

| Common name | Number of nests | Common name | Number of nests |
|---|---|---|---|
| Cormorant, Reed | 61 | Egret, Western Cattle | 35 |
| Darter, African | 24 | Heron, Black-headed | 12 |
| Egret, Great | 16 | Heron, Grey | 1 |

**Table 18**: Details of the additional waterbirds counted at the artificial wetland at Vaalkop Water Treatment Works on 26 November 2022.

| Common name | Number | Common name | Number |
|---|---|---|---|
| Crake, Black | 10 | Lapwing, Blacksmith | 20 |
| Duck, African Black | 1 | Moorhen, Common | 20 |
| Duck, White-faced Whistling | 10 | Plover, Three-banded | 20 |
| Goose, Spur-winged | 1 | Ruff | 1 |
| Grebe, Little | 1 | Sandpiper, Common | 1 |

| | | | |
|---|---|---|---|
| Heron, Purple | 1 | Sandpiper, Wood | 15 |
| Heron, Squacco* | 20 | Stilt, Black-winged | 3** |
| Jacana, African | 1 | Swamphen, African | 10 |
| Kingfisher, Malachite | 3 | Wagtail, Cape | 2 |

* - possibly breeding

** - breeding

A signboard at the site (**Figure 57**) suggested that a bird hide was once present there (no sign of it apparently remains). The proposed upgraded water pipeline route is situated 230 m from the edge of this artificial wetland and 300 m from the breeding colony at the closest points (**Figure 51**). It is imperative that the upgrading of the water pipeline does not cause damage or disturbance to this breeding colony. There seems relatively little risk of this though as the pipeline route is fairly distant from the colony and there are a several other current potential sources of disturbance closer to the colony that do not appear to be having any negative impact (**Figure 51**).


**Figure 57:** Signage suggesting a bird hide was once present at the artificial wetland at Vaalkop Water Treatment Works where the communal waterbird breeding site was located.

***v. Part of the proposed water pipeline upgrade apparently not following an existing pipeline route***

Examination of Google Earth imagery suggests that part of the apparent proposed upgraded water pipeline route does not appear to follow an existing pipeline route and therefore would comprise a 'greenfields' development (**Figure 58).** It was not possible to directly examine this stretch of proposed pipeline on the ground due to access issues, although the road parallel to this stretch was traversed during the field investigation.

It would be preferable for the pipeline to follow existing pipeline routes for its entire length, especially as there would appear to be an existing pipeline route visible on Google Earth that apparently could be exploited in this regard (**Figure 58**). *It is recommended that the pipeline follow this existing route (dashed blue line in **Figure 58**) through this section.*


**Figure 58:** Proposed re-routing of the Bulk WaterLine

8.5.3 Summary of impacts assessed

## 8.6 Cultural Heritage Aspects of the area

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E5 & E6**– Heritage & Paleo Impact Assessment Report for more details).

**Results of the Heritage Study:** During the survey, as number of site-specific limitations were encountered which might have had an impact on the identification of sites and features of heritage significance:

- Large sections of both the power line and the water pipeline could not be accessed due to it being on private land, in most cases located behind game fences with locked gates.
- The vegetation cover encountered proved to be a big obstacle as ground visibility was much limited as well as preventing access due to the nature of the brush, more specifically swarthaak (*Senegalia mellifera*).
- Some of the river crossings on smaller track roads were washed away, necessitating the taking of large detours, which in some cases proved difficult to complete as access to the other side was not always possible. (see **Appendix E5**).

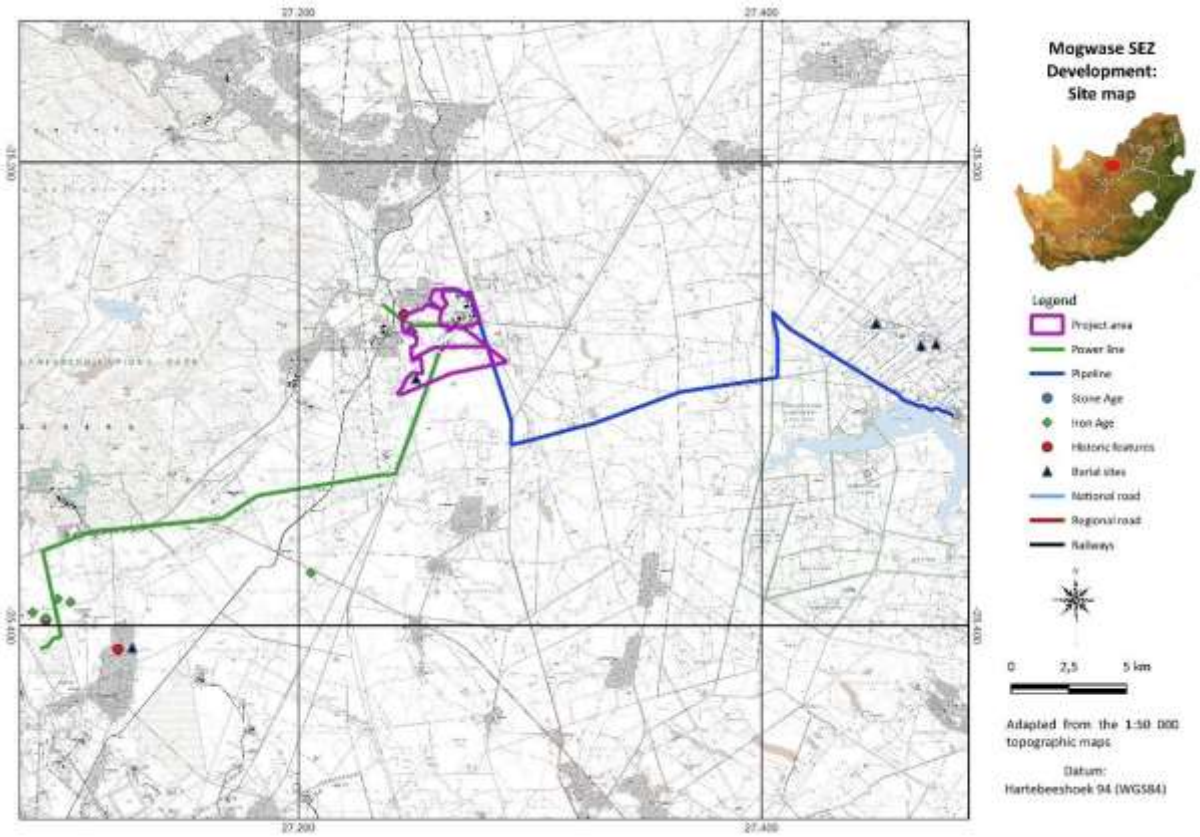



**Figure 59:** Map showing the location of the identified sites and features

This survey identified a number of sites and features located in the larger project area, with only a limited number in close proximity of the proposed development.

- Settlement and exploitation of the region started during the Early Stone Age and carried on throughout the Middle Stone Age into the Later Stone Age. This occupation is usually indicated by the presence of stone tools occurring in the vicinity of hills and outcrops as well as on the banks of rivers.
    - It is known that stone tools dating to the MSA are found in the vicinity of the various streams crossing the area, as well as on outcrops and low hills.
    - It is anticipated that the impact of the development of this type of site would be negligible as typically development would not take place on stony outcrops or hills.
- Settlement sites dating to the Early Iron Age, are often found in open areas close to rivers where the rich alluvial soils were exploited for cultivation of crops. Later, during the Late Iron Age, sites tend to cluster at the foothills of the various mountains and hills in the larger region. This was mostly the result of the influx of large groups of people which led to uncertainty and stress. People therefore tended to build their settlements in more protected areas, on or near hills and mountains.
    - At present, a small number of such sites are known to be located in the vicinity of the southwestern section of the power line.
        - Fortunately, the known sites are located sufficiently far away from the proposed power line route, that it would not be impacted on.

**Figure 60:** Rock gongs dating to the Late Iron Age, used during ritual occasions

- Heritage sites dating to historic times are found in the larger region, as well as in the project area.
  - A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years.
- Cemeteries known to exist in the larger region, with only one known to be located inside the project area.
  - It is possible that smaller, isolated burial sites might also occur sporadically in the project aera.
    - The grave of young boy that died in 1932. There might be a second grave only marked with stones.

**Figure 61:** One marked grave and a possible second unnamed grave

- The remains of linear developments, such as roads, railways, railway stations, power lines and telephone lines that would pass through the area. This would include railway stations, bridges and culverts.

    - An abandoned railway line, constructed during the late 1970s with the development of Bodirelo Industries, crosses through the area. However, it has been abandoned and the tracks have been removed. All that remains are sections of the embankments and one river crossing (**Figure 62**).
        - Due to its recent age, it is viewed to have low significance.

**Figure 62:** Section of the old railway line, showing the culvert crossing the Mogwase spruit

*From the above review it is therefore possible to say with a very high degree of certainty that based on the available information, the type of environment in which the development is to take place and the site survey, this is an area with a low potential for the presence of heritage sites and resources.*

**Results of the Paleo Study**

The development is underlain by the rocks of mostly the Bushveld Complex, Vaalian in age, with a VERY LOW Palaeontological Sensitivity (Groenewald and Groenewald 2014*). This development will take place on igneous rocks; therefore, the impact will be VERY LOW.

**Palaeontological Sensitivity**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BUSHVELD MAGMATIC PROVINCE / BUSHVELD COMPLE<br><br>diabase (Vdl)<br>unnamed granophyre (VC)<br>Rashoop Granophyre Suite (Vra)<br>Croydon Subsuite (Vc)<br>Dwars River Subsuite (Vdr)<br>Dsjate Subsuite (Vds)<br>Roossenekal Subsuite (Vrs)<br>Lebowa Granite Suite (Vlg)<br>Shelter Norite (Vsn) | Vdl; VC; Vra; Vc; Vdr; Vds; Vrs; Vlg; Vsh; Vsh1; Vmn; Vme; Vzo; Z; Z23; Z26; Vcr; Vdj; Vds; Vmt1; | | | | | Intrusive igneous rocks<br>Late Vaalian / Early Proterozoic 2.06 Ga<br><br>Mafic intrusives of Rustenberg Layered Suite<br><br>Intrusive granites granophyres | No fossils recorded | Bushveld Complex has been described as "One of the great geological wonders of the world" – the largest layered igneous complex in the world with the richest reserves of platinum group metals known anywhere.<br><br>Intruded between Magaliesberg Fm quartzites (Pretoria Group) and the Rooiberg Group volcanics. |

*Groenewald, G. and Groenewald, D., 2014. SAHRA Palaeotechnical Report: Palaeontological Heritage of the North West Province (Pp 22), South African Heritage Resources Agency.

No fossils recorded due to the igneous nature.

## 8.7 Visual Impact

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E7** – Visual; Impact Assessment Report for more details).

### 8.7.1 Results of the Visual Impact Assessment

#### i. Sense of Place

The sense of place is different between the three (3) landscape categories. The natural-farmland landscape category is largely dictated by the predominantly natural character associated with the Central Sandy Bushveld vegetation type. It consists of dense to open groupings of trees and shrubs and have a homogenous vegetation cover over most of the study area. It appears vacant, but farmsteads are widely distributed throughout this area. The even topography doesn't allow panoramic views across the landscape as one's view is limited to the road reserve which is more open.

The mixed development category is recognised for the low-density residential development and small commercial and industrial sectors, separated by large open spaces. The buildings and structures are seldom higher than two storeys and barely exceeds the height of the vegetation. Due to the local economic hub, there is an energetic hustle of traffic and human movement. Notwithstanding, the rural connection with the environment remains evident with cattle roaming free in the open spaces between the various residential developments.
The Pilanesberg Reserve is an icon in the area due to its origin and the ecological importance attached to it. It is also a prominent topographical feature in an otherwise flat landscape and is highly visible. Its presence provides identity to the study area and is unique in its context.

#### ii. Viewshed Analysis

The dark red represents areas that have the potential to view the greatest number of points, i.e., the largest portion of the project may be visible from these areas. As the colour grades towards the pink spectrum, a lesser number of points may be visible from those areas (**Figure 63 - Figure 65**).

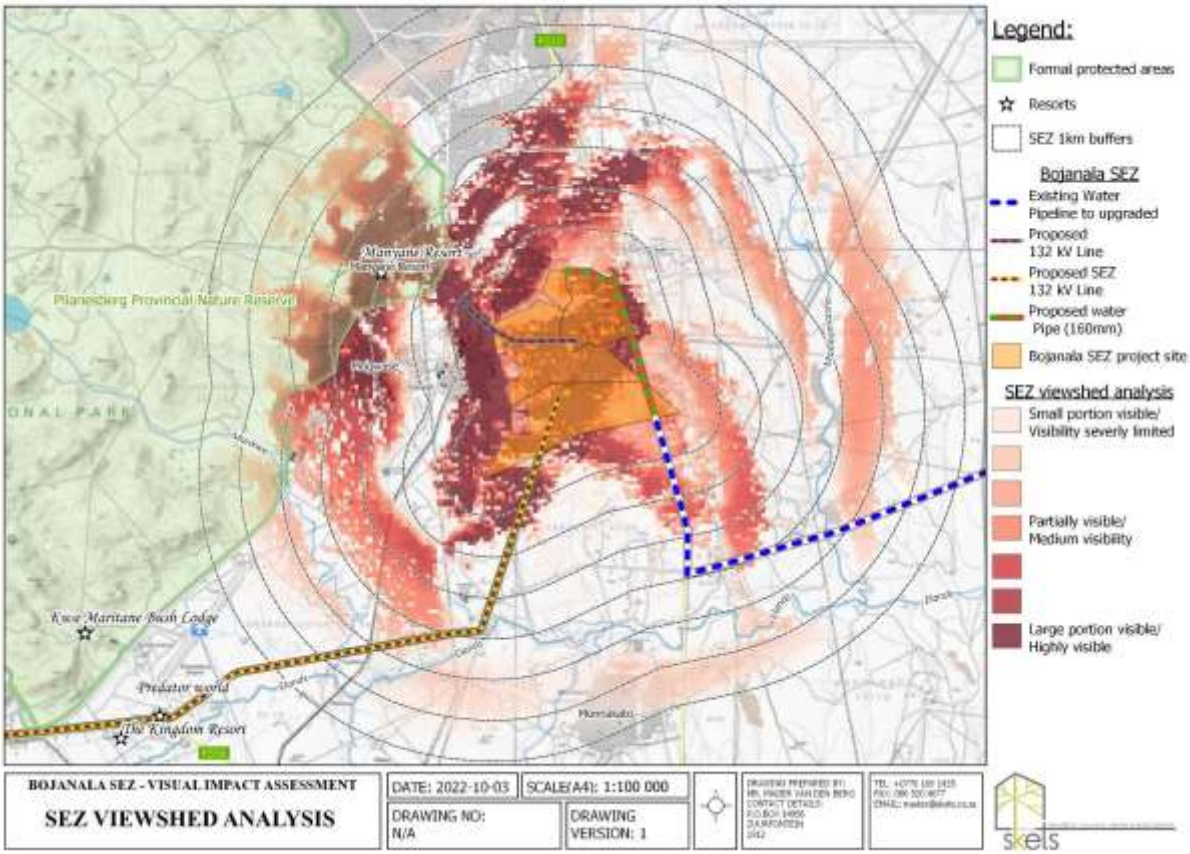



**Figure 63:** SEZ viewshed analysis

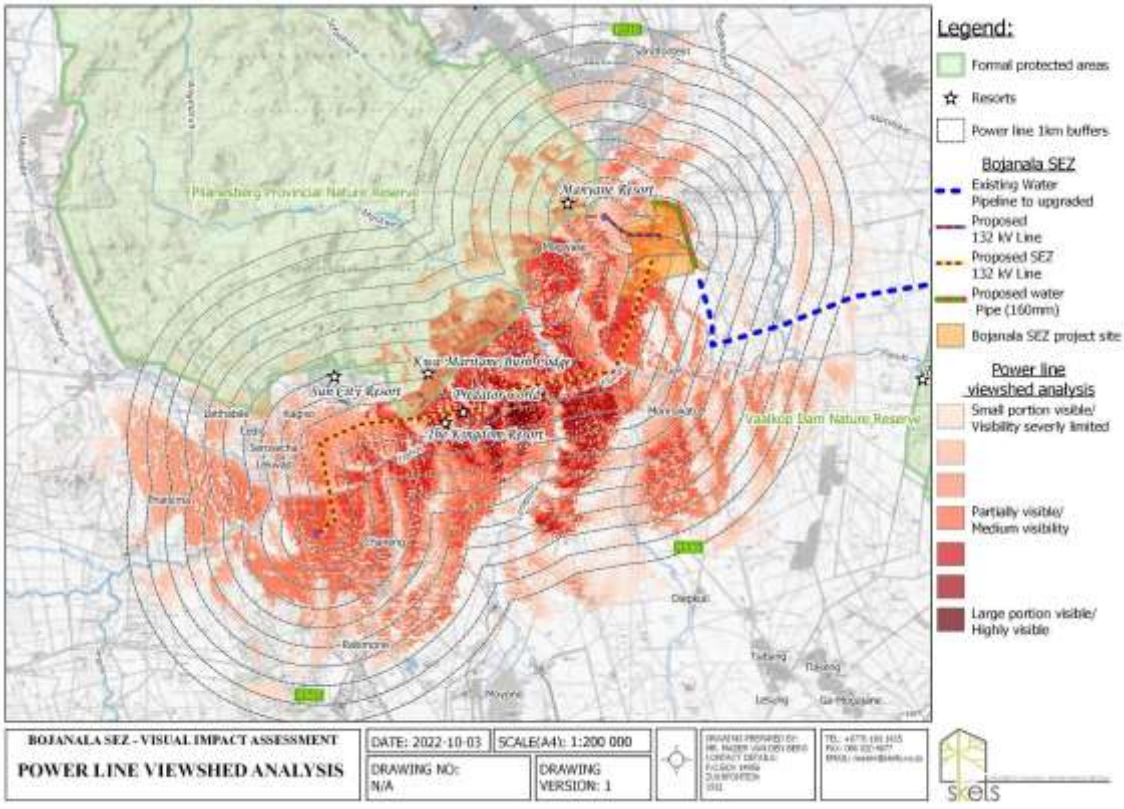



**Figure 64:**Powerline viewshed analysis

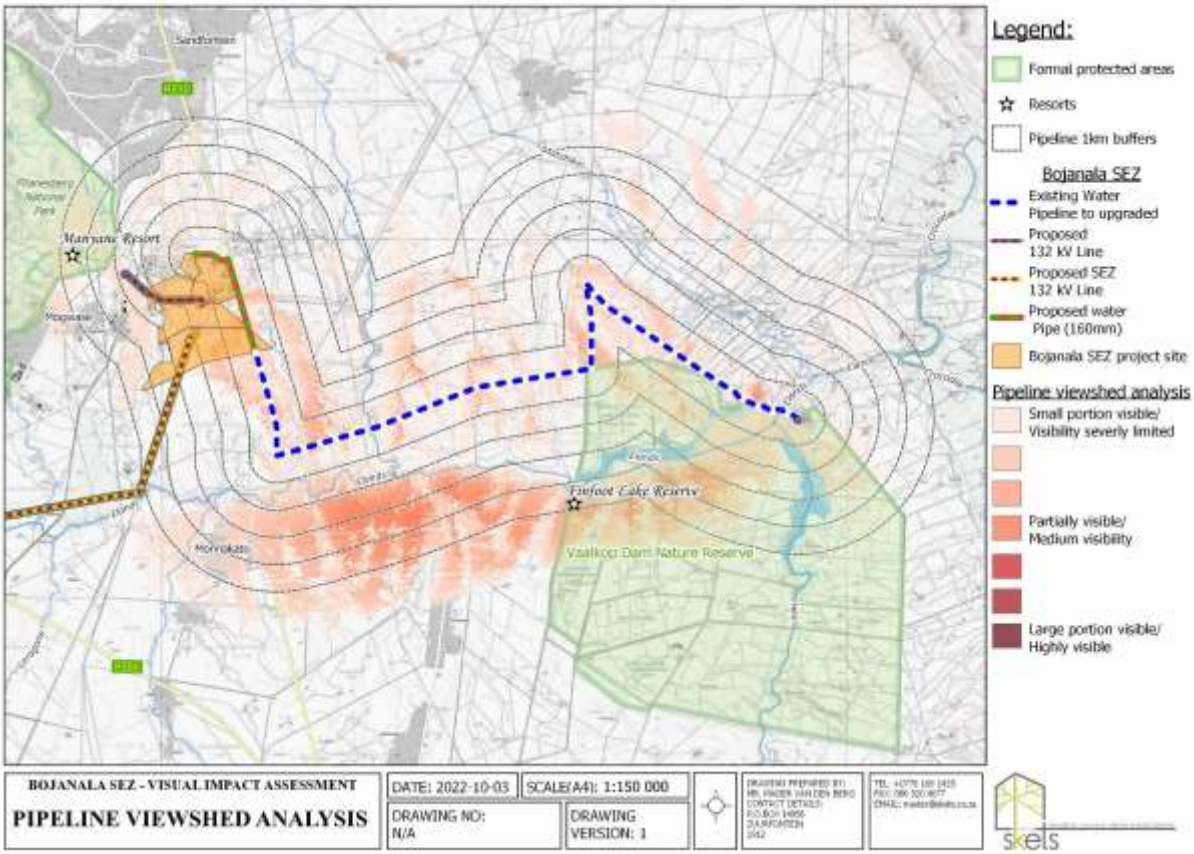



**Figure 65:** Pipeline viewshed analysis

Several views were assessed during the site investigation as illustrated in. It records the study area in order to understand the screening ability of the vegetation cover, as this will have a noticeable effect on the visibility of the project components. It has been established that the pipeline construction activity will be greatly screened due to the dense tree and shrub cover that exists along its route. Its only when nearing the SEZ that the vegetation becomes less dense due to the intense grazing that occurs and the presence of powerlines and roads in this area which removed some of the vegetation.

The SEZ development will also experience a much-reduced visibility extent as a result of the vegetation cover, on condition that the final structure heights remain below 2 storeys. Taller structures will exceed the height of the vegetation and reach greater visibility extents.

The powerline is considered a tall element in the context of the landscape and will exceed the height of the vegetation cover. The fact that it also runs parallel to existing powerlines with corridors that have been cleared, also increases its visibility extent. The ZMVE, i.e., within 2 km of the power line route, will be the focus of the assessment as this distance is considered the area of the greatest visual exposure.

The conclusion is that the study area generally provides a high degree of screening from certain locations due to the relatively thick vegetation cover, as long as the source of impact remain lower than the height of the vegetation. The even topography also contributes to the high degree of

### 8.7.2 **Visual Sensitivity**

**i) Receptor Sensitivity** The following observer groups have been identified in the study area:

- Tourists;
- Residents;
- People at their place of work; and
- Motorists

- **Tourists** are generally classified as observers with a high sensitivity when their reason for visiting the area is focussed on enjoying the visual quality and engaging in outdoor activities that are offered by the study area's natural landscape. The most prominent tourist destination in the study area is indicated on **Figure 63 - Figure 65** of which The Kingdom Resort and Predator World is located within the ZMVE of the powerline route. Their exposure to the impacts from the powerline is expected high due to its proximity to these two tourist attractions. The other resorts and lodges are outside the ZMVE and vegetation screening is expected to limit visibility to a degree where visual exposure is minimal/negligible. A low viewer incidence is expected.

  Tourist sensitivity outside the ZMVE will be medium due to their reduced exposure to the impacts.

- **Residents** in the study area are generally classified as visual receptors of high sensitivity owing to their sustained visual exposure and attentive interest towards their living environment. Residents from Mogwase, in particular Mogwase Unit 5A, are directly adjacent to the SEZ and will be exposed to the impacts generated by the development of the SEZ and the powerline. They are within the ZMVE and are currently overlooking the Mogwase tributary and open spaces across the tributary. Their views are considered pleasant, although not unique within the context of the study area. However, illegal dumping along the roads in the open space, blemishes the visual value of the open space as a visual resource. **A low**

  The powerline route near the Ngwedi Substation passes close to the settlements of Ledig and Chaneng. These settlements are on the perimeter of the ZMVE and vegetation screening will play a role in limiting visual exposure, although partial views may still be possible. All residents outside the ZMVE will have a medium sensitivity.

  It should also be noted that due to the flat topography in the area, the houses nearest to the sources of impact will block the views of residents living in the blocks behind them. Houses are typically one and 2 storeys high, and garden trees increase the screening of views to the sources of impact. Therefore, only the residents living on the perimeter of the suburb and settlements fronting the sources of impact, will have full exposure, and those behind them will only experience partial or no views.

- **The surrounding farms** are sparsely populated and spread out with only a few farmsteads located along the pipeline and powerline routes. Their exposure to the potential visual impacts will be much reduced due to the flat topography and the dense vegetation in these areas. Viewer incidence is expected to be very low.

- **People at their place of work** are considered to have a low sensitivity as their focus is on their work activity. Workers at Bodirelo Industrial area, Mogwase CBD and the Sun Village are mostly indoors and will have a short exposure duration at irregular intervals when the SEZ and powerlines are developed. The viewer incidence is expected to be low.

- **Motorists** are considered the least sensitive group of observers due to the speed at which they travel and their brief exposure to impacts. The major transport routes in the study area are the R510 and R556. These routes carry high volume traffic and motorists will be exposed to a section of the pipeline and the SEZ along the R510, and a section of the powerline along the R556. Intermitted views of the sources of impacts are

expected as motorists travel through the study area. Their location is inside the ZMVE for sections of the pipeline and powerline, but their exposure will be brief. Viewer incidence will be relatively high.

### ii) Sensitivity of the Landscape Character

The study area has been divided into three distinguishable landscape character categories namely:

- The natural-farmland landscape;
- The mixed development category; and
- The Pilanesberg Reserve.

- **The sensitivity of the natural-farmland** landscape is considered medium due to the intactness of its natural character. Slight transformation is noticeable in some areas where small-scale farming is conducted, but the overall impression is that the eastern and southern part of the study area is fairly natural. It also presents a relatively high VAC due to the flat topography and dense vegetation cover. Inter-visibility with adjacent landscape is severely hampered as a result of the flat topography and dense vegetation cover. This landscape has very few high value attributes and is considered rather common in the context. The Vaalkop Dam and Elands River are pleasant features but will not be directly affected by the proposed project.
- **The mixed development category** has a low sensitivity. The character is typical of a small industrial and residential node and no unique features sets it apart from any other development. The large open spaces separating the various land uses, establishes a low density, rural character, but unfortunately these open spaces are not protected from illegal dumping and other disturbances. The Mogwase tributary that separates Mogwase from the SEZ, can be considered a natural amenity and ecologically important visual resource. This raises the sensitivity on a local scale but is not influential enough to increase the sensitivity on a regional scale. Another feature worth mentioning, is the backdrop of the Pilanesberg Mountains some 4 km to the west. The mountains are unique in an otherwise flat landscape and are pleasant features with moderately high visual value.
- **The Pilanesberg Reserve** is iconic in the province and together with its unique geological origin, it is also a distinguishable topographical feature with rich ecological diversity. Views towards the mountains are highly valued as it rises above the plains and displays a natural character. The Pilanesberg Reserve will not be affected directly by the powerline, but the views towards the mountains from the surrounding landscape, may be affected. This landscape category has a very high sensitivity.

## 8.7.3 Summary of impacts assessed

i) Visual Impacts During Construction Phase

- **Severity of pipeline impacts:**
    - **Nature of impact on observers**: Visual intrusion can be expected due to unsightly construction activities that will negatively interfere with the views of the observers along the pipeline route. The project activities will noticeably change the existing landscape features and introduce new features that are uncharacteristic to the visual environment. The main construction activities will include excavations done by earthmoving equipment and are expected to have a limited ZVI due to the high screening capacity of

the vegetation cover. The occasional dust cloud may exceed the vegetation cover but is considered a temporary occurrence. More exposed views are expected along the R510 when construction occur along a busy road.

- **Nature of impact on landscape character**: The construction phase will introduce new elements to the visual environment (i.e. construction equipment) that are otherwise uncharacteristic within the context of the landscape. The linear excavation will follow the existing pipeline route and will remain within the existing servitude. The existing vegetation cover in the servitude will be damaged/removed and will be temporarily replaced by an excavation and soil piles. Unsightly scarring of the landscape will negatively impact on the scenic quality of the visual resource.

- **Severity of SEZ impacts.**
  - **Nature** of impact on observers: Visual intrusion can be expected due to unsightly construction activities that will negatively interfere with the views of the observers within the ZMVE of the SEZ. The project activities will noticeably change the existing landscape features and introduce new features that are uncharacteristic to the visual environment. The main construction activities will include services installation and bulk earthworks during the initial stages. The later construction activities will revolve around buildings and structures. Large areas are expected to be stripped of vegetation to make way for the development. A phased approach will be followed which will see smaller areas be developed over an extended timeframe.
  - **Nature** of impact on landscape character: The construction phase will introduce new elements to the visual environment (i.e. construction equipment) that are otherwise uncharacteristic within the context of the landscape. The existing vegetation cover on the property will be damaged/removed and replaced by unsightly bare earth while construction continues. A noticeable change in the qualities of the landscape will occur which will translate into negative impacts on the scenic qualities.

- **Severity of powerline impacts**
  - **Nature** of impact on observers: The construction activity will damage vegetation at the pylon locations and where new access roads are required. Construction sites are considered unsightly and will intrude on the views of observers inside the ZMVE. Initially the construction activity will be on ground level and vegetation screening will limit visibility. As the towers are erected, the ZVI will increase and more viewers will be affected.
  - **Nature** of impact on landscape character: The construction activity will damage vegetation at the pylon locations and where new access roads are required. These activities will negatively impact on the attributes of the landscape as it will remove or damage elements that contribute to the prevailing character of the landscape. The construction equipment, construction camps and workforce will be elements that are uncharacteristic to the visual environment. It will impact on the visual value and quality of the landscape character especially in the areas that are considered more natural.

ii) Visual impacts during operational phase

- **Severity of pipeline impacts**

- **Nature** of impact on observers: The completed pipeline will be underground with the exception of the inspection holes protruding slightly above ground. This is expected to be no different to what the current scenario is and therefore no visual change is expected. Some disturbed areas may take longer to rehabilitate than others, which will cause some visual intrusion due to the unsightly nature of bare soil.
- **Nature** of impact on landscape character: The completed pipeline will be underground with the exception of the inspection holes protruding slightly above ground. This is expected to be no different to what the current scenario is and therefore no visual change is expected. Some areas may remain bare soil if rehabilitation is not fully successful, but reestablishment of vegetation is expected to happen over time.

- **Severity** of SEZ impacts
  - **Nature** of impact on observers: The completed SEZ will expand on the current industrial theme by filling the open spaces with infrastructure and buildings. Although the type of development is not unfamiliar or in stark contrast with the existing land uses, it will increase the dominance of the industrial theme as the aim is to develop a successful economic hub. The pleasant views over the existing open spaces will be replaced by the industrial and mixed-use developments which will alter the current views and may cause visual intrusion.
  - **Nature** of impact on landscape character: The completed SEZ will fill in and expand unto the open spaces that currently contribute to a rural and sparsely developed residential and industrial character. The SEZ will expand on the existing industrial theme, thereby increasing the dominance of industrial infrastructure from ± 127ha to 1117ha. A loss of open space will occur and it is expected that the landscape character will be altered to a much larger developed area.

- **Severity** of powerline impacts
  - **Nature** of impact on observers: The completed powerline will add another powerline to the visual environment and increase the visual dominance of the powerline corridor. Although it is considered compatible with the existing land use of linear power infrastructure, it will remain in contrast with the natural-farmland landscape character as it will exceed the height of the natural vegetation and interfere with views to other valued visual resources such as the Pilanesberg Mountains. This is particularly true for motorists travelling on the R556 and tourists visiting the Predator World and The Kingdom Resort. The visual clutter of powerlines will increase, which will detract from the scenic quality of the environment.
  - **Nature** of impact on landscape character: The completed project will add another powerline to a landscape that is already dominated by linear power infrastructure. It will detract from the value of the natural features such as the vegetation and views towards the mountainous backdrop, thereby affecting the scenic quality of the landscape.

## 8.8 Social environment Impacts

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E8** – Spcila Impact Assessment Report for more details).

### 8.8.1 **Results of the Social Impact Assessment**

Relevant baseline social status quo characteristics at the site, in the MKLM and the BPDM will have to be considered with the corresponding social aspects of the proposed project, to understand:

- Social baseline characteristics of the potential project beneficiaries and receptors; and
- How the project social characteristics will potentially change the current social status quo.

i) Increasing Regional Employment

In SIA consultations, community members expressed that they were tired of people saying that the community is unskilled. They said locals could not be expected to be working hard labour all the time. They suggested that for construction and operations of the SEZ, an audit of the availability of local skills such as building, electrical work, etc. be done before procurement, so that locals can be employed. They also recommended there be a requirement in contracts for upskilling local people and companies, and development funds and training should be provided for this. They pointed out that people in the area were depressed because of unemployment, and there is related alcohol and drug abuse, including use of nyaope. However, those in the working age group were generally not willing to work because wages are low and working environments are not conducive. They alleged, for example, expectations at work are different for people at the same level, and salaries are different for people at the same level. According to them, local people were overlooked and not protected in the business environment. It was important that companies comply with labour laws meant to protect employees. Businesses in the area also highlighted that many companies have been here since 1984 and various changes have occurred since then, with negative impacts for employees.

ii) Progressing Regional Economic Growth

A site visit on 19 October 2022 to the proposed SEZ site showed many businesses operating at the Bodirelo Industrial Township site. There were also some dilapidated buildings, which may have to be removed if it is not viable to refurbish them. In SIA consultations businesses currently operating in the Bodirelo Industrial Township requested that construction activities do not disrupt or compromise their businesses. They also highlighted challenges with the current basic services delivery for the industrial site. They said that water was sometimes unavailable, and when it was restored, the water was dirty. They are also challenging with sewage, as there is bad smell from the industrial area to the township. Load shedding is also adversely affecting businesses, for example, the printing process at Golden Era. They highlighted that they used heavy machinery, and the solar energy that is planned for the site will have to meet these energy needs. Additionally, some roads in the area, for example one with links to the Botswana border gate, is in a bad condition. Some businesses have delivered extensive social empowerment projects, for example through setting up retail businesses in the communities in North West province. Most recently, a lady has been empowered to set up a water bottling business. Businesses, however, also pointed out that many educated youth who were unemployed were not interested entrepreneurship, but rather preferred “office jobs”.

Communities said that local people & SMMEs are overlooked and not protected in the business environment. For example, they pointed out, the SEZ area is large and there is insufficient housing accommodation for such a big project. The community wanted to be involved in building new housing developments. They also wanted their capacity to be built so that they can provide construction and operational services for infrastructure that is being planned for the SEZ, such as the landfill for waste management. They stated that there should be a requirement in contracts for upskilling local people and companies, and development funds for this should be made available.

Moreover, they expressed their need to empower themselves for the future. As communities not under traditional law, they were seeking opportunities to invest in shares of new companies in the SEZ.
Members of the community who participated in the SIA consultation meeting were unhappy that they were not consulted for the project, and they would like to be able to provide their inputs for the SEZ development in future.

iii) Social and Economic Displacement

During the site visit conducted on 19 October 2022 many cattle were observed to be randomly grazing and roaming in the proposed Bodirelo Industrial site. There were also dilapidated buildings, which will either be renovated or demolished during construction on site. It could not be verified during the site visit if these buildings are legally or illegally occupied for economic activities.

### 8.8.2 **Summary of impacts assessed**

The Bojanala SEZ development project can deliver social benefits in the short and long terms—locally, regionally and nationally—and management measures must promote and enhance these where possible. Potential negative impacts are also anticipated in the short and long terms, and these will have to be reduced or avoided with management measures.

A project of this nature is associated with the following potential positive impacts:

- Providing employment, by creating permanent and temporary employment during all 3 phases of the development;
- Economic development is promoted, through procurement and provision of goods and services, and stimulating local and regional economic activities such as transportation, during all 3 phases of the development.

The following negative impacts are possible if not mitigated:

- Decreased quality of life, from:
    - Increased pressure on municipal and provincial services through increased demand for housing and social services such as for health, education and recreation, particularly during operations.
    - Injuries and ill health, due to greater exposure to community health and safety risks. These have been identified to be associated with potential:
        - Vehicle and pedestrian accidents during all 3 phases of the development;
        - Exposure to hazardous conditions during all 3 phases of the development;
        - Creation of unsafe conditions if basic services at construction workers' camp are inadequate during construction and decommissioning phases;
        - HIV/AIDS during the construction and decommissioning phases of the development if these are for prolonged periods of time; and
        - Personal security during all phases of the development.
- Physical and economic displacement if residences or businesses are currently located in the footprint of the proposed infrastructure will be affected.

## 8.9 Air Quality environment Impacts

Potential impacts and the relative significance of the impacts are summarised below (refer to **Appendix E9** – Air Quality Impact Assessment Report for more details).

Waste Water Treatment Plants Emission Sources:

- Odour emissions associated with overall waste water treatment activities;
- Waste water storage
- Aeration during primary treatment;
- Aerobic digestion;
- Anaerobic digestion; and
- Sludge drying.

Construction activities associated with the development of the WWTP within the proposed Mogwase SEZ are additional sources of fugitive emissions of dust at the project site. However, these fugitive emission sources will not be significant, with associated emissions being intermittent and short-term (for construction), in comparison to long-term emissions associated with the operations at the proposed sites. Therefore, the fugitive emission sources associated with the construction/development of the proposed landfill site and WWTP were not modelled in this study.

Based on the dispersion model output plots, as would be expected - predicted concentrations of all pollutants under the actual scenario are lower than those predicted under the expansion scenario.

Predicted dustfall rates, PM10 and PM2.5 concentrations under the actual scenario mostly comply with the applicable residential and non-residential area standards (for dustfall), and the daily and annual NAAQS (for PM10 and PM2.5), with higher concentrations and dustfall rates, including exceedances of the standards, predicted inside the proposed SEZ boundary close to the existing landfill sites and along a small section of the western SEZ boundary. Under the expansion scenario, the predicted concentrations still fall well below the applicable standards over most of the project area, with exceedance patterns similar to those observed under the actual scenario for dustfall and PM2.5. In contrast, exceedances of the PM10 standards extend to the areas just outside the western and southern SEZ boundaries.

Predicted hydrogen sulphide concentrations are relatively low over most of the surrounding areas, with higher concentrations, including exceedances of the Alberta air quality guidelines projected in near proximity to the landfill sites and WWTP, and just outside the proposed SEZ boundary (to the west and south-east) within maximum radii of 1.3km and 1.5km for the actual and expansion scenarios, respectively. Under the actual scenario, residents located within a 1km radius west and south-east of the proposed SEZ boundary could potentially experience odour impacts associated with hydrogen sulphide emissions. The same is true under the expansion scenario, however, potential odour impacts would be experienced over a wider area, i.e. within a 1.7km radius of the SEZ boundary to the west and south-east.

Predicted benzene, toluene, ethylbenzene and xylene (BTEX) concentrations for the actual scenario are largely compliant with applicable standards and air quality guidelines over the project area for most of the pollutants,

except for small, localised exceedances of the annual benzene NAAQS of 5 µg/m3 and the xylene air quality guideline of 2 300 µg/m3 in proximity to the existing WWTP, including exceedances of the hourly benzene air quality guideline of 30 µg/m3 which extend to areas beyond most sections of the proposed SEZ boundary, but within a maximum radius of 3.7km. Under the expansion scenario, non-compliances of relevant standards are observed for benzene, toluene and xylene. However, exceedances are generally restricted to near the existing and proposed WWTPs and a small portion of the western SEZ boundary, except for exceedances of the hourly benzene standard which extend over a wider area. Predicted concentrations for all pollutants, except xylene (under expansion scenario), fall well below the recommended odour recognition thresholds.

Predicted hourly average concentrations of carbon disulphide are very low over the areas surrounding the landfill sites under both the actual and expansion scenarios. On the other hand, higher hourly concentrations are predicted for dimethyl sulphide and the mercaptan compounds, with exceedances occurring near the landfill sites and outside the western and southern proposed SEZ boundaries. Exceedances observed outside the SEZ boundaries are restricted to maximum radii of 650m and 1.5km under the actual and expansion scenarios, respectively. Exceedances of the odour recognition thresholds are also observed for dimethyl sulphide and the mercaptan compounds. For dimethyl sulphide, the non-compliances occur near the landfill sites and beyond the western and southern proposed SEZ boundaries, within maximum radii of 650m and 750m under the actual and expansion scenarios, respectively. For the mercaptan compounds, similar patterns in non-compliances are observed, however, exceedances outside the SEZ boundaries extend further up to maximum radii of 2.5km and 3.5km under the actual and expansion scenarios, respectively. This suggests that people residing in areas within approximately 750m and 3.5km south and west of the proposed SEZ could potentially detect or recognise odours associated with emissions of dimethyl sulphide and the mercaptan compounds, respectively. Mercaptan compounds are known to have a strong odour, even at very low ambient concentrations.

Predicted hourly average concentrations of vinyl chloride and dichloromethane, as well as daily average concentrations of dichloroethylene, trichloroethylene and tetrachloroethylene (for the landfill sites) are marginally high but mostly fall well within the relevant air quality guidelines under both scenarios, with exceedances restricted to small areas near the landfill sites and along the western SEZ boundary for vinyl chloride and trichlorethylene. No exceedances of the recommended odour recognition thresholds are predicted for all chlorinated compounds.

Predicted hourly average ammonia concentrations are high but comply with the Alberta air quality guideline (1 400 µg/m3) over most areas surrounding the existing and proposed landfill sites and WWTPs, with exceedances of the air quality guideline projected close to the emission sources, along the western proposed SEZ boundary (under actual scenario) and within a 250m radius of the western and southern proposed SEZ boundaries (under expansion scenario). No exceedances of the recommended odour recognition threshold are predicted for ammonia.

Under both scenarios, predicted hourly average concentrations of acetone, methanol and phenol as well as daily and annual average concentrations of chloroform are generally high but mostly remain below the relevant air quality guidelines for all pollutants except chloroform. Predicted daily chloroform concentrations comply with the applicable Ontario air quality guideline beyond 8km and 11km of the proposed SEZ boundary under the actual

and expansion scenarios, respectively, while predicted annual concentrations are compliant with the relevant guideline beyond 2.5km (actual scenario) and 6km (expansion scenario) of the site boundary, respectively. No exceedances of the recommended odour recognition thresholds are predicted for non-methane organic compounds (NMOCs).

## 8.10 Impacts on Existing Roads and Traffic

To the North of this proposed development is President Avenue, the East side is the R510 and to the south is the unnamed road running east to Ga-Ramokoka and west to the Industrial Site. The Special Economic Zone (SEZ) is connected by several roads network from the south along the National 4 (N4) there is a connection with the R104 traversing the Rustenburg CBD then connecting to the west on the R565 right into the R556 and left onto President Avenue outside the Pilanesberg International Airport. The second connection from the Rustenburg CBD along the R104 is the R510 Road north of the centre of the business district, running north/ south to the SEZ proposed development area with connection to the SEZ off the R510 Rd.

Gauteng Province is connected along the N4 onto the R556 Rd north with two opportunities off the R556 Rd onto President Ave or off the R556 Rd turns right onto the R510 Rd north.

From the Limpopo Province north of the Special Economic Zone, the R510 Rd is the direct connection to the proposed site development running north/ south.


**Figure 66:** Regional Locality/ Road Network

An increase in traffic can be expected during the construction phase. The movement of machinery and vehicles will constitute an additional source of noise to the study area. However, this will be limited to the period of

construction and mitigation can involve the use of equipment fitted with noise abatement technology (where possible) and the restriction of construction to certain days and times.

Considering the size and extent of the study area, it is difficult to estimate exactly which roads will be utilised for the transport and consequently deliver equipment to the site from various centres. It was therefore decided to firstly assess the access roads outside the study area for importing components and consequently site access roads within the study area being utilised during construction.

## 8.11 Assumptions, uncertainties, and gaps in knowledge of the study

A number of limitations and assumptions, as described below, are noted for this environmental impact assessment.

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on human perceptions. It is the visual specialist's aim to utilise as much quantitative data and scientific research as possible, to substantiate professional judgement and to motivate subjective opinions
- Although all watercourses occurring within 500m of the proposed activities were mapped at a desktop level, field investigations were confined to only those rivers to be impacted by the project activities. For the purpose of this assessment this was considered all watercourses occurring within 200m of the powerline alignments
- The mapping and classification of the watercourse units outside of the study area but occurring within a 500m radius of activities should be considered preliminary and coarse in resolution. These units were not verified in the field.

# 9 ASSESSMENT OF POTENTIAL IMPACTS

In terms of APPENDIX 3(3)(1) of the EIA Regulations 2017 (as amended), an Environmental Impact Assessment Report must include –

**h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including—**

*(v) The impacts and risks identified 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;*

***i) A full description of the process undertaken to identify, assess and rank the impacts that the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including** –*

*(i) A description of all environmental issues and risks that were identified during the environmental impact 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*

***(j) An assessment of each identified potentially significant impact and risk, including –***

*(i) Cumulative impacts;*

*(ii) The nature, significance and consequences of the impact and risk;*

*(iii) The extent and duration of the impact and risk;*

*(iv) The probability of the impact and risk occurring;*

*(v) The degree to which the impact and risk can be reversed;*

*(vi) The degree to which the impact and risk may cause irreplaceable loss of resources;*

*(vii) The degree to which the impact and risk can be mitigated.*

This chapter serves to assess the significance of the positive and negative environmental impacts (direct, indirect, and cumulative) expected to be associated with the **3 major components** to be built are as follows:

1. The **SEZ Development Zones** with the following infrastructures within its footprint (as described in section 2.23)
2. **Proposed** SEZ **132kV Powerline** – From SEZ to Ngewdi Substation
3. Upgrading of existing **Bulk Water line** from Vaalkop Water Treatment Works to Bodirello Industrial Area

## 9.1 Assessment of alternatives

The following alternatives have been considered and assessed through this EIA report. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects are considered. The details pertaining to each alternative considered, as well as the technical preference are provided below:

**Location alternatives:**

- **No other site alternatives are proposed for the SEZ** as criteria used for selecting a suitable location for the SEZ are based on those characteristics required for the development of an industrial node. Provincial Government commitment to improve and install infrastructure; the site is suitable for development as it is flat with very little topographical constraints and the site is located in an area that needs development. The land is available for development; Part of the land is already zoned for industrial purposes. The site enjoys good access from the main access roads R510 and R556 and most infrastructures is available.

**Layout alternatives:**

- **Pipe Material Alternatives** (Bulk Water Supply Line): HDPE-Type Material (Alternative 1): Normally required where soil conditions are dolomitic and highly corrosive; Considered quite expensive compared to other pipe materials, i.e uPVC, mPVC, concrete, steel. Normally not readily available. UPVC-Type Material (Alternative 2): Normally not prescribed for dolomitic soil conditions; Relatively cheaper and more cost effective as compared to HDPE; Readily available, however, availability was a challenge during the last year and more as a result of shortage of importation of raw materials as a result of the Russia-Ukraine unrest.
- **Electrical Powerline Alternatives**: Overhead lines make up a large part of the interconnected system. They ensure low-loss transmission at 380-kV extra-high voltage, and thus guarantee reliable energy supply. Cables, in contrast, are predominately used in medium- and low-voltage networks, as well as for power distribution in densely built-up areas with high electricity demand. Nevertheless, underground cables have, in many cases, economic, ecological and legal disadvantages which must be carefully taken into consideration. The 132 kV overhead line would be the most feasible option from an environmental and financial perspective.

**Technology alternatives:**

- **Stream Crossings Alternatives** (Bulk Water Supply Line): Open Trench Excavation (Alternative 1): This method of crossing the stream entails bulk earthworks and soil removal. This activity will alter the stream bed and may cause damage to the existing surrounding environment and stream banks. This method is normally quite fast and also quite cost-effective. Trenchless Technology via pipe-Jacking or Pipe-Drilling (Alternative 2): This method does not require any bulk earthworks and excavation and normally only requires excavation of “launch pits” on either side of stream where pipes are hydraulically jacked / drilled into its final position from one side of the stream to the other side. This could be a time-consuming method, dependent on the hardness of the underground material. This method is also extremely expensive
- **Waste Water Treatment Alternatives** Existing Pond System (Alternative 1): This is a simple and natural treatment process making use of anaerobic and natural oxidation processes to break down sewer effluent via a series of retention dams. It is simple to construct. It is up to 7 times more cost-effective than conventional activated sludge treatment plants. It is simple and easy to maintain and not very reliant on electricity supply, which is a great benefit considering the current energy crisis. Conventional Mechanical Activated Sludge Treatment Plants (Alternative 2): Quite a complex process and complex to construct and operate and maintain. Extremely expensive to construct and to

subsequently maintain. Heavily reliant on electricity. Thus, a large part of capital cost is the provision of alternative energy supply to the plant. Furthermore, due to lack of maintenance and regular power outages, these plants are prone to overflowing and polluting the surrounding environment and downstream water courses.

**NB:** ***The potential impacts discussed in the impact tables in this section are relevant for the both the technology and design alternatives considered for this project for the majority part as these alternative considered do not differ considerably in their significance as far as Environmental Impacts are concerned. Therefore, in most part of this section the assessment tables the alternatives are not comparatively assessed however where applicable, the differences are highlighted in red.***

***In addition to the alternative considered, specialist has made some recommendations to slightly change alignment to avoid sensitive issues along the routes. These recommendations are also highlighted in red in these assessment tables***

## 9.2 Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so
that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

As per the DEAT Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- **Cumulative impacts** are impacting that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. therefore, assuming worst case scenario.

In addition to the above, the impact assessment methodology includes the following aspects whereby the significance of the impact is calculated as follows and rating significance is explained below.

» The **nature**, 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. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).

» The **duration**, wherein it is indicated whether:

- The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
- The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
- Medium-term (5–15 years) – assigned a score of 3;
- Long term (> 15 years) - assigned a score of 4; or;
- Permanent - assigned a score of 5.

» The **magnitude**, quantified on a scale from 0-10, where a score is assigned:

- 0 is small and will have no effect on the environment;
- 2 is minor and will not result in an impact on processes;
- 4 is low and will cause a slight impact on processes;
- 6 is moderate and will result in processes continuing but in a modified way;
- 8 is high (processes are altered to the extent that they temporarily cease); and

- 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

» The **probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:

- Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
- Assigned a score of 2 is improbable (some possibility, but low likelihood);
- Assigned a score of 3 is probable (distinct possibility);
- Assigned a score of 4 is highly probable (most likely); and
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

» The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.

» The **status**, which is described as positive, negative or neutral.

» The degree to which the impact can be reversed.

» The degree to which the impact may cause irreplaceable loss of resources.

» The degree to which the impact can be mitigated.

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

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

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

» **< 30 points**: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

» **30-60 points**: Medium/Moderate (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

» **> 60 points**: High (i.e. where the impact must have an influence on the decision process to develop in the area).

The specialist findings presented in this section represents a summary of the detailed and original specialist studies contained in the relevant appendices to this report **(Appendices E1 to E10).** The current summary of specialist findings is provided in the interest of brevity and with a view to facilitating public facilitating public participation; as contemplated in the NEMA principles. The Competent Authority, with its mandate of substantive review of the EIA report, is therefore urged to also read the original specialist studies in the relevant appendices to this report with the aim of discharging its decision-making function. *Should any discrepancy occur between this summary, and the relevant detailed specialist study; the detailed specialist study will prevail.*

## 9.3 Assessment Tables

9.3.1 Aquatic and Wetland Impact Assessment.

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1: Changes in water flow regime**<br><br>**Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow.<br><br>**Activity**: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the residential development.<br><br>***Residual Risks: Considered to be low given that optimal design is followed*** | **MEDIUM** | • Design of watercourse crossings should ensure no nett negative effect on local or regional hydrology<br>• Construction methods should be carefully reviewed to ensure the least impact to the watercourse is ensured.<br>• Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost.<br>• Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.<br>• Where necessary, corrective action should be determined by a team of specialists including engineers, hydrologists and ecologists<br>• After closure of the trench, the contours should resemble pre-development conditions. Where lateral water flow in the soil profile is intercepted by the trench and pipe, this water should be released back into the watercourse in such a way as to not cause scouring or erosion | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impacts 2:** Changes in sediment regime<br><br>**Nature:** Changes in sediment regimes of the aquatic ecosystem and its sub -catchment by for example sand movement, meandering river mouth /estuary, changing flooding or sedimentation patterns<br><br>**Activity**: Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. Possible sources of the impacts include:<br><br>***Residual Risks:*** *Moderate to high since reversing sediment pollution is unlikely to be effective and may cause more damage*<br><br>**Alternative 2 (Trenchless Technology) is Preferred for Bulk Waterline Stream Crossings** | **MEDIUM** | • Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.<br>• Sediment traps should be installed<br>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.<br>• Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.<br>• During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the adjacent surface vegetation.<br>• Sediment control should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.<br>• Excavated materials (from any trenching) should not be contaminated and it should be ensured that the minimum surface area is taken up<br>• Any excavated soil/ stockpiles may not exceed 1 m in height. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later usage as backfill material.<br>• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.<br>• Monitoring should be done to ensure that sediment pollution is timeously dressed | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impacts 3:** Introduction and spread of alien vegetation<br><br>**Nature:** Introduction and spread of alien vegetation.<br><br>**Activity:** The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plans can easily colonise and impact on downstream users.<br><br>***Residual Risks**: Expected to be high due to high density of alien plants on the study site.* | **MEDIUM** | • Implement an Alien Plant Control Plan<br>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.<br>• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.<br>• Rehabilitate or revegetate disturbed areas | **LOW** |
| **Impact 4:** Loss and disturbance of watercourse/pan habitat and fringe vegetation.<br><br>**Nature:** Loss and disturbance of watercourse habitat and fringe vegetation.<br><br>**Activity**: Earthworks within the wetland areas<br><br>***Residual Risks:** Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation and control of alien species on the site is undertaken where necessary.*<br><br>**Alternative 2 (Trenchless Technology) is Preferred for Bulk Waterline Stream Crossings** | **MEDIUM** | • The development footprint should remain outside the delineated wetland, riparian areas and buffer zones.<br>• Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas<br>• Implement an Alien Plant Control Plan<br>• Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.<br>• Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 5:** Changes in water quality<br><br>**Nature:** Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication<br><br>**Activity**: Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/rivers and a reduction in watercourse function.<br><br>***Residual Risks:*** *Expected to be low since the development footprint is located outside the delineated wetlands or buffer zones.*<br><br>*It is recommended that the existing pond sewer treatment system be used for further expansion and upgrading of the treatment capacity. Therefore* ***Alternative 1*** *(Existing Pond System) of the Waste Water Treatment is* ***preferred.*** | **MEDIUM** | • Locate the infrastructure outside the calculated buffer zone<br>• Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.<br>• Provision of adequate sanitation facilities located outside of the watercourse area or its associated buffer zone<br>• The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.<br>• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.<br>• Maintenance of construction vehicles / equipment should not take place within the watercourse<br>• Measures should be put in place to prevent spills or water contaminated by waste material by for example constructing sumps or drains which can contain any spills in order for contaminated water to be isolated from the watercourse and removed from the site for appropriate disposal<br>• Implement Best Practice with regards to concrete mixing on site and control of waste and pollution All manholes are to be raised above the 1:100 year floodline<br>• Manholes should be constructed to SANS 1200 specification with maximum spacing of 80 m<br>• Ensure that sewage infrastructure include emergency measures to contain spills, for example emergency by-pass lines<br>• It should be ensured that regular maintenance takes place to prevent | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | failure of any infrastructure associated with the proposed development;<br>• The managing authority should test the integrity of the pipelines at least once every five years or more often should there be any sign or reports of a leak.<br>• Standard Operating procedures, training drills and audits should be put in place and revised annually.<br>• A detailed rehabilitation plan should be drawn up with the input from a water quality, soil contamination assessment and ecologist should any spills occur.<br>• Independent water quality analyses should be undertaken annually, or as specified by an aquatic specialist, to demonstrate and audit compliance of effective pollution control measures<br>• | |
| **Impact 6:** Loss of aquatic biota<br><br>**Nature:** Loss of instream habitat, deposition of wind-blown sand, loss of fringing vegetation and erosion, alteration in natural fire regimes and subsequent loss of non-marginal and marginal vegetation. Increase in invasive species due to disturbance. Change in water quality. Changes in flow<br><br>**Activity**: Loss and disturbance of biota due to direct development on the watercourse as well as changes in habitat including water quality, the water column, increased sediment, increased alien vegetation fire regime and habitat fragmentation<br><br>***Residual Risks:*** *Due to the already seriously modified nature of the aquatic ecosystems surrounding the proposed development it is expected to be limited provided that the mitigation measures are implemented correctly, and effective rehabilitation of the site is undertaken where necessary.* | **MEDIUM** | • Ensure that no additional vegetation is removed,<br>• Avoid unnecessary aquatic ecosystem crossing - limit work within the stream, river or wetland. The use of single access points for crossings.<br>• Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or its associated buffer zones.<br>• Mark all areas which don't form part of the proposed development within the watercourse as no-go areas.<br>• Weed control in aquatic ecosystem and buffer zone.<br>• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.<br>• All management procedures listed above for the change in water quality | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Alternative 2 (Trenchless Technology) is Preferred for Bulk Waterline Stream Crossings.** | | | |
| **OPERATIONALPHASE IMPACTS** | | | |
| **Impact 1: Changes in water flow regime**<br><br>**Nature**: Changing the quantity and fluctuation properties of the watercourse by for example diverting or obstructing flow.<br><br>**Activity**: The sources of this impact include the compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the residential development.<br><br>***Residual Risks: Considered to be low given that optimal design is followed*** | **MEDIUM** | • After closure of the trench, the contours should resemble pre-development conditions. Where lateral water flow in the soil profile is intercepted by the trench and pipe, this water should be released back into the watercourse in such a ways as to not cause scouring or erosion | **LOW** |
| **Impacts 2:** Changes in sediment regime<br><br>**Nature:** Changes in sediment regimes of the aquatic ecosystem and its sub -catchment by for example sand movement, meandering river mouth /estuary, changing flooding or sedimentation patterns<br><br>**Activity**: Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount). Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. Possible sources of the impacts include: | **MEDIUM** | • Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.<br>• Monitoring should be done to ensure that sediment pollution is timeously dressed | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| ***Residual Risks:*** *Moderate to high since reversing sediment pollution is unlikely to be effective and may cause more damage* | | | |
| **Impacts 3:** Introduction and spread of alien vegetation impact ratings<br><br>**Nature:** Introduction and spread of alien vegetation.<br><br>**Activity**:<br>Activity: The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plans can easily colonise and impact on downstream users.<br><br>***Residual Risks****: Expected to be high due to high density of alien plants on the study site.* | **MEDIUM** | • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.<br>• Rehabilitate or revegetate disturbed areas | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 4:** Loss and disturbance of watercourse/pan habitat and fringe vegetation.<br><br>**Nature:** Loss and disturbance of watercourse habitat and fringe vegetation.<br><br>**Activity**: Earthworks within the wetland areas<br><br>***Residual Risks**: Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation and control of alien species on the site is undertaken where necessary.*<br><br>**Alternative 2 (Trenchless Technology) is Preferred for Bulk Waterline Stream Crossings** | **MEDIUM** | • Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.<br>• Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish | **LOW** |
| **Impact 5:** Changes in water quality<br><br>**Nature:** Changes in water quality due to input of foreign materials e.g. due to increased sediment load, contamination by chemical and /or organic effluent, and /or eutrophication<br><br>**Activity**: Construction and operational activities may result in the discharge of solvents and other industrial chemicals, leakage of fuel/oil from vehicles and the disposal of sewage resulting in the loss of sensitive biota in the wetlands/rivers and a reduction in watercourse function.<br><br>***Residual Risks:** Expected to be low since the development footprint is located outside the delineated wetlands or buffer zones*<br><br>***Alternative 1** (Existing Pond System) is **preferred.**for the Waste Water Treatment iPlant* | **MEDIUM** | • Standard Operating procedures, training drills and audits should be put in place and revised annually.<br>• A detailed rehabilitation plan should be drawn up with the input from a water quality, soil contamination assessment and ecologist should any spills occur.<br>• Independent water quality analyses should be undertaken annually, or as specified by an aquatic specialist, to demonstrate and audit compliance of effective pollution control measures | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON THE AQUATIC AND WETLANDS | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 6:** Loss of aquatic biota<br><br>**Nature:** Loss of instream habitat, deposition of wind-blown sand, loss of fringing vegetation and erosion, alteration in natural fire regimes and subsequent loss of non-marginal and marginal vegetation. Increase in invasive species due to disturbance. Change in water quality. Changes in flow<br><br>**Activity**: Loss and disturbance of biota due to direct development on the watercourse as well as changes in habitat including water quality, the water column, increased sediment, increased alien vegetation fire regime and habitat fragmentation<br><br>***Residual Risks:*** *Due to the already seriously modified nature of the aquatic ecosystems surrounding the proposed development it is expected to be limited provided that the mitigation measures are implemented correctly, and effective rehabilitation of the site is undertaken where necessary*<br><br>**Alternative 2 (Trenchless Technology) is Preferred for Bulk Waterline Stream Crossings** | **MEDIUM** | • Weed control in aquatic ecosystem and buffer zone.<br>• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.<br>• All management procedures listed above for the change in water quality | **LOW** |

### 9.3.2 Vegetation Impact Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1: Destruction of natural vegetation on the development site**<br><br>**Nature**: The development will require the removal of vegetation for the purpose of infrastructure, access roads, servitudes and the footprint of the development. Illegal disposal of construction material such as oil, cement etc. could destroy natural vegetation<br><br>**Activity**: The sources of this impact include:<br>○ Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers (stepping on small plants);<br>○ Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction;<br>○ Edge effects e.g. heavy vehicles turning in adjacent areas;<br>○ Storage of equipment within vegetation; and<br>○ Maintenance vehicles driving within natural or rehabilitated vegetation, not impacted on during the construction, will lead to the destruction of naturally occurring vegetation and compaction of soils and subsequent erosion or colonisation by alien invasive plant species. In addition, failed rehabilitation could lead to soil erosion during rainfall events and flooding.<br><br>**Residual Risks:** •Localised alteration of soil surface characteristics and loss of flora. Increased fragmentation of remaining vegetation • Possible invasion by alien invasive plant species and densification | **MEDIUM** | *Planning:*<br>• Removal of vegetation must be restricted to the proposed development footprints<br>• Plan to maintain naturally vegetated open spaces around drainage lines and through the development to ensure ecological corridor through the site.<br>• Conserve at least 200m of naturally vegetated open space from the edge of the river or drainage lines. The vegetation should be conserved in its current state, while removing all alien and invasive plant species.<br>• Naturally vegetated open spaces must be retained in the development that connects to the riparian areas and drainage lines. These areas should not be fragmented patches, but rather form corridors through the development that link with the open space set aside along the watercourses. The national conservation target for Central Sandy Bushveld is 19%. Thus, open spaces on the site should cover a minimum of 19% of the site (excluding the buffer areas to watercourses as delineated by the wetland specialist)<br>• Keep large trees intact as far as possible.<br>*Construction:*<br>An independent Ecological Control Officer (ECO) should be appointed to oversee construction.<br>• Keep the development footprint in Medium SEI categories as small as possible<br>• Trees should be pruned instead of removed (where possible)<br>• Keep the work area (e.g. area to be disturbed) to a minimum.<br>• A temporary fence or demarcation must be erected around the construction area (include the actual footprint, as well as areas where material is stored and needed for | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| of bush encroacher species. | | e.g. trenching) to prevent access to adjacent vegetation.<br>• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.<br>• No open fires are permitted within naturally vegetated areas.<br>• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.<br>• Implement a vegetation rehabilitation plan. Due to the dry climate, natural colonisation could take a long time, in which vegetation may degrade (bush encroachment) or be invaded by alien invasive plant species. Therefore, timeous rehabilitation is imperative.<br>• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.<br>• Introduce adequate sedimentation control measures at watercourse crossings and when excavation or disturbance along watercourses takes place.<br>• Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation<br>  ○ Never mix topsoils with subsoils or other spoil materials<br>• Maintain site demarcations in position until the cessation of construction work.<br>• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. | |
| **Impacts 2:** Destruction of natural vegetation: Linear infrastructure<br><br>**Nature:** The development will require the removal of vegetation for the purpose of access roads, servitudes and the footprint of the development. Illegal disposal of construction material such as oil, cement etc. could | **MEDIUM** | *Planning:*<br>• Removal of vegetation must be restricted to the pylon and pipeline footprint.<br>• The route through the Pilanesberg National Park should be reconsidered and align as close as possible with the road reserve and fence line where historic disturbances took place. | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| destroy natural vegetation.<br><br>**Activity**: The sources of this impact include:<br>○ Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers (stepping on small plants);<br>○ Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction;<br>○ Edge effects e.g. heavy vehicles turning in adjacent areas;<br>○ Storage of equipment within vegetation; and<br>○ Maintenance vehicles driving within natural or rehabilitated vegetation, not impacted on during the construction, will lead to the destruction of naturally occurring vegetation and compaction of soils and subsequent erosion or colonisation by alien invasive plant species. In addition, failed rehabilitation could lead to soil erosion during rainfall events and flooding.<br><br>**Residual Risks*:*** Localised alteration of soil surface characteristics and loss of flora Increased fragmentation of remaining vegetation along the powerline and pipelines. Possible erosion and invasion by alien invasive plant species and densification of bush encroacher species.<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | | • Trees underneath the powerline or along the works area for the pipeline, must be pruned to acceptable heights, instead of clear-felling. This will limit degradation of the vegetation and the subsequent invasion by alien invasive plant species.<br>• Keep the work area (e.g. area to be disturbed) to a minimum.<br>• Manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the high SEI areas<br><br>*Construction:*<br><br>An independent Ecological Control Officer (ECO) should be appointed to oversee construction.<br><br>• Keep the development footprint in Medium SEI categories as small as possible<br>• Keep the work area (e.g. area to be disturbed) to a minimum. Manual labour is recommended to keep the servitude as small as possible, with no heavy vehicles driving over or turning within the high SEI areas<br>• A temporary fence or demarcation must be erected around the construction area (include the actual footprint, as well as areas where material is stored and needed for e.g. trenching) to prevent access to adjacent vegetation.<br>• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.<br>• No open fires are permitted within naturally vegetated areas.<br>• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.<br>• Implement a vegetation rehabilitation plan. Due to the dry climate, natural colonisation could | |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | take a long time, in which vegetation may degrade (bush encroachment) or be invaded by alien invasive plant species. Therefore, timeous rehabilitation is imperative. E<br>• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.<br>• Introduce adequate sedimentation control measures at watercourse crossings and when excavation or disturbance along watercourses takes place.<br>• Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation<br>▪ Never mix topsoils with subsoils or other spoil materials<br>• Maintain site demarcations in position until the cessation of construction work.<br>• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. | |
| **Impacts 3:** Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses<br><br>**Nature:** The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully, particularly due to the high occurrence of invasive plant species in the study area. Seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance / operational vehicles could disturb rehabilitated areas which | **MEDIUM** | Planning:<br>• Avoid direct impacts into riparian areas and drainage line and maintain buffer area as recommended by the wetland specialist as a minimum<br>• Plan to remove as little indigenous vegetation as possible.<br>• Compile a stormwater management plan that will safeguard the proximate watercourses from construction and operational impacts.<br><br>Construction:<br>• Do not allow erosion to develop on a large scale before acting.<br>• Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern.<br><br>**Activity**: The sources of this impact include:<br>• Removal of vegetation in proximity to the rivers and drainage line, without proper rehabilitation or failure of rehabilitation;<br>• Access roads, especially on slopes, channel rainfall and causes erosion;<br>• Lack of rehabilitation or failed rehabilitation;<br>• Maintenance / operational vehicles disturbing rehabilitated areas;<br>• Spillages of construction material and harmful chemicals; and<br>• Failure of rehabilitation of the construction footprint.<br><br>**Residual Risks:** No indigenous vegetation cover in disturbed areas (failed rehabilitation). Colonisation by alien invasive plant species. | | • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).<br>• Runoff from roads must be managed to avoid erosion and pollution problems.<br>• Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (erosion management plan required)<br>• Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.<br>• Colonisation of the disturbed areas by indigenous plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.<br>• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.<br>• Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.<br>• After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level. | |
| **Impact 4:** Removal / Destruction of protected plants and plants of conservation concern<br><br>**Nature:** Development could impact on suitable habitat to plant species of conservation concern. Such species were not confirmed to occur; however, suitable habitat is present for two (2) Near threatened species, of which one was recorded north of the pipeline to be upgraded 50m corridor.<br>Species historically classified as Declining, national protected trees and | **MEDIUM** | *Planning:*<br>• **The specific individual industrial and commercial activities or projects that will be on the development site must assess their smaller footprint for plant species of conservation concern prior to commencement of planning activities. See Appendix C with regards to the two (2) species mostly likely to occur and their associated habitat preferences.**<br>• **Ensure that the environmental authorisation stipulates that provincial protected species can be removed / relocated or apply for a permit to do so.** | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| provincially protected species will also be impacted, however, these can be relocated to suitable habitat on the site, but outside of the development footprint, to ensure their persistence.<br><br>**Residual Risks***:* Degradation of habitat due to invasion by alien invasive plant species or a change in fire regime. • Edge effects from the development and increased traffic into the habitat of such species | | • Survey the final footprints of pylons and pipelines for plant species of conservation concern. This must inform permit applications<br>• *Boophone distichia* and *Crinum* species must be relocated to outside of the development footprint if it will be impacted on.<br>• Provincially protected succulents should be relocated to open spaces outside of the development footprint with the permission of the local authority.<br>• Apply for permits for the destruction or pruning of national protected trees through the local Department of Forestry, Fisheries and the Environment (DFFE). Assessed areas that will be cleared for construction to determine the number of national protected tree species that will be affected. This will inform he permit application.<br><br>*Construction:*<br>• The ECO should take note of any unearthed geophytes and succulents (other than *Aloe* species) and contact a specialist for the correct identification and threat status of the species. This will determine whether any follow-up action is required.<br>• Construction workers may not tamper or remove these plants, and neither may anyone collect seed from the plants without permission from the local authority. | |
| **Impact 5:** Potential increase in alien and invasive vegetation<br><br>**Nature:** The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation around the development are unsuccessful or is not enforced, exotic and invasive vegetation may further invade the area. | **HIGH** | • Alien invasive species, in particular category 1b species that were identified within the study area, should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.<br>• All alien seedlings and saplings must be removed as they become evident for the duration of construction.<br>• All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.<br>• If filling material is to be used, this should be sourced from areas free of invasive species. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Residual Risks:** Reinfestation or introduction of additional weeds during construction. | | | |
| **Impact 6:** Bush densification<br><br>**Nature: *:*** Bushveld is prone to bush densification whereby open bushveld, in the absence of good veld management, become denser and dominated by stands of encroacher species e.g. "stands of plants of the kinds specified in Table 4 of Regulation 16 (CARA), where individual plants are closer to each other than three times the mean crown diameter" (Agricultural Research Council, 2013). Plants in this group are not alien plants, but indigenous plants that tend to become abnormally abundant when the area is degraded (Agricultural Research Council, 2013). The plants themselves are thus not the problem, but their increased abundance or encroachment into bushveld serves as an indicator of poor land management practices.<br><br>Disturbances and a lack of fire can result in species such as *Vachellia karroo, V tortilis, Dichrostachys cinerea, Senegalia melifeara,* and *Tarchonanthus camphoratus* densifying in the surrounding landscape. Encroacher species are highly likely to establish in disturbed and degraded areas if not managed.<br><br>**Residual Risks*:*** Bush densification<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | **MEDIUM** | • Leave as much natural vegetation intact as possible.<br>• Do not disturbed soil unnecessary and do not disturbed vegetation or soils beyond the site boundary.<br>• Monitor rehabilitation and do not allow grazing to take place until such time that re-vegetation was found to be successful.<br>• Ensure that areas outside of the operational footprint that were disturbed, are adequately rehabilitated and that dense stands of encroacher species are prevented. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | | |
| **Impact 7:** Linear infrastructure: Clearing of land for construction camps and potential pollution of the soil and water<br><br>**Nature:** These may be at one or several locations, area will be cleared and levelled where necessary, site offices may be temporary structures, machinery, building supplies and temporary staff facilities (excluding accommodation) will be housed here. The impacts could include:<br>• Removal of vegetation<br>• Levelling and compaction of soils<br>• Storage of machinery, supplies and staff facilities<br><br>This could lead to the loss of vegetation and/or species of conservation concern, alteration, and loss of microhabitats, altered vegetation cover, increased erosion and contamination of soil and groundwater.<br><br>***Residual Risks:*** Compaction on construction camps could result in altered topsoil characteristics and vegetation composition. These areas are also prone to invasion by alien invasive plant species. | **MEDIUM** | • Keep the clearing of natural veld to a minimum and locate construction camps within transformed or modified areas.<br>• No building of temporary infrastructure allowed in watercourses and buffers as recommended by the wetland specialist.<br>• After the final layout has been approved, conduct a thorough footprint investigation to determine any protected plant species population location and size.<br>• Stay within demarcated temporary construction areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas<br>• Prevent spillage of construction material and other pollutants, contain, and treat any spillages immediately, strictly prohibit any pollution/littering according to the relevant EMPr<br>• No open fires may be lit for cooking or any other purposes, unless in specifically designated and secured areas<br>• Facilities may not be used as staff accommodation<br>• After construction remove all foreign material prior to starting the rehabilitation<br>• The rehabilitation plan for all temporarily affected areas must aim to re-introduce species naturally occurring in the Central Sandy Bushveld<br>• Monitor the establishment of invasive species and remove as soon as detected, whenever possible before regenerative material can be formed | **LOW** |
| **Impact 8:** Compaction and destruction of soils<br><br>**Nature:** The movement of heavy machinery over vegetated areas during construction and maintenance will result in soil compaction that will modify habitats, destroy vegetation, and inhibit re-vegetation. Soil compaction | **MEDIUM** | • Vehicles and machinery may not veer from the dedicated roads.<br>• Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.<br>• Prior to construction, the topsoil must be removed and stored separately from subsoil. The | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| because of vehicles and traffic, could lead to a decrease of water infiltration and an increase of water runoff. Such areas are more likely to be colonised by pioneer, alien invasive plant species, than indigenous species. This will further transform the vegetation of the area. The health of the topsoil is imperative for re-vegetation. Incorrect stripping, handling and storage could lead to failed rehabilitation.<br><br>**Residual Risks:** Altered soil characteristics and vegetation that remain in an unstable, pioneer phase or invaded by alien invasive plant species. | | topsoil is imperative for the successful re-establishment of indigenous vegetation and it carries seed from the existing vegetation<br>• Topsoil (the upper 25 cm of soil) is an important natural resource; where it must and can be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil.<br>• Topsoil is typically stored in berms with a width of 150 – 200 cm, and a maximum height of 100 cm, preferably lower, ideally in a disturbed but weed-free area. Place berms along contours or perpendicular to the prevailing wind direction.<br>• Rapid decomposition of organic material in warm, moist topsoils decreases microbial activity necessary for nutrient cycling, and reduces the number of beneficial micro-organisms in the soil. Therefore, topsoil should therefore not be stored for extensive periods and it is recommended that the reapplication of topsoil takes place as soon as possible. Adhere to the following general rule: the larger the pile of topsoil storage needs to be, the shorter should be the time it is stored<br>• Topsoil handling should be limited to stripping, piling (once), and re-application.<br>• Any movement of heavy machinery or vehicles over stored topsoils must be strictly prohibited. | |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impact 1: Destruction of natural vegetation on the development site**<br><br>**Nature**: The development will require the removal of vegetation for the purpose of infrastructure, access roads, servitudes and the footprint of the development. Illegal disposal of construction material such as oil, cement etc. could destroy natural vegetation | **MEDIUM** | • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.<br>• Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.<br>• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.<br>• Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | construction phase should be adhered to.<br>• Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO.<br>• Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO.<br>• Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the Maintenance Period to allow for sufficient rehabilitation growth | |
| **Impacts 2:** Destruction of natural vegetation: Linear infrastructure<br><br>**Nature:** The development will require the removal of vegetation for the purpose of access roads, servitudes and the footprint of the development. Illegal disposal of construction material such as oil, cement etc. could destroy natural vegetation.<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | **MEDIUM** | • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.<br>• Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.<br>• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.<br>• Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.<br>• Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO.<br>• Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO.<br>• Repair all erosion damage as soon as possible and in any case not later than six months | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | before the termination of the Maintenance Period to allow for sufficient rehabilitation growth<br>• The servitude must be naturally vegetated and trees pruned instead of removed (where possible) | |
| **Impacts 3:** Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses<br><br>**Nature:** The removal of surface vegetation will expose the soils, which in rainy events would wash down into the watercourses, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully, particularly due to the high occurrence of invasive plant species in the study area. Seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance / operational vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern. | **MEDIUM** | • Do not disturbed soil or indigenous vegetation unnecessary during maintenance.<br>• Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.<br>• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.<br>• Monitor rehabilitation and ensure that rehabilitated areas do not erode.<br>• If monitoring finds that indigenous vegetation from the surrounding bushveld is not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in the area, are sowed in order to re-establish indigenous plant cover.<br>• Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. | **LOW** |
| **Impact 4:** Removal / Destruction of protected plants and plants of conservation concern<br><br>**Nature:** Development could impact on suitable habitat to plant species of conservation concern. Such species were not confirmed to occur; however, suitable habitat is present for two (2) Near threatened species, of which one was recorded north of the pipeline to be upgraded 50m corridor.<br>Species historically classified as Declining, national protected trees and provincially protected species will also be impacted, however, these can be | **MEDIUM** | • Prevent trampling and edge effects beyond the approved development footprint.<br>• The relocated species should be monitored for at least three years post relocation. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| relocated to suitable habitat on the site, but outside of the development footprint, to ensure their persistence.<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | | | |
| **Impact 5:** Potential increase in alien and invasive vegetation<br><br>**Nature:** The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation around the development are unsuccessful or is not enforced, exotic and invasive vegetation may further invade the area. | **MEDIUM** | • No alien and invasive plant species as listed on 18 September 2020 in the list of Alien Invasive Species published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 43726 of 2020) may be planted within the development.<br>• Only use indigenous species, naturally occurring in the area, for rehabilitation or landscaping.<br>• Remove alien invasive species from the disturbance footprint as soon as they become apparent. | **LOW** |
| **Impact 6:** Bush densification<br><br>**Nature:** *:* Bushveld is prone to bush densification whereby open bushveld, in the absence of good veld management, become denser and dominated by stands of encroacher species e.g. "stands of plants of the kinds specified in Table 4 of Regulation 16 (CARA), where individual plants are closer to each other than three times the mean crown diameter" (Agricultural Research Council, 2013). Plants in this group are not alien plants, but indigenous plants that tend to become abnormally abundant when the area is degraded (Agricultural Research Council, 2013). The plants themselves are thus not the problem, but their increased abundance | **MEDIUM** | • Monitor the establishment of dense stands of encroacher species and remove or thin as soon as detected.<br>• A rehabilitation plan, using indigenous species from the study area, must be implemented that will restore disturbed areas beyond the footprint of the infrastructure to what it was prior to construction, thereby making the impact on the remainder of the site negligible in the long term. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VEGETATION | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| or encroachment into bushveld serves as an indicator of poor land management practices.<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | | | |
| **Impact 7:** Linear infrastructure: Clearing of land for construction camps and potential pollution of the soil and water<br><br>**Nature:** These may be at one or several locations, area will be cleared and levelled where necessary, site offices may be temporary structures, machinery, building supplies and temporary staff facilities (excluding accommodation) will be housed here. The impacts could include:<br>• Removal of vegetation<br>• Levelling and compaction of soils<br>• Storage of machinery, supplies and staff facilities | **MEDIUM** | • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete. | **LOW** |
| **Impact 8:** Compaction and destruction of soils<br><br>**Nature:** The movement of heavy machinery over vegetated areas during construction and maintenance will result in soil compaction that will modify habitats, destroy vegetation, and inhibit re-vegetation. Soil compaction because of vehicles and traffic, could lead to a decrease of water infiltration and an increase of water runoff. Such areas are more likely to be colonised by pioneer, alien invasive plant species, than indigenous species. This will further transform the vegetation of the area. The health of the topsoil is imperative for re-vegetation. Incorrect stripping, handling and storage could lead to failed rehabilitation. | **LOW** | • Maintenance vehicles may not deviate from dedicated roads. | **LOW** |

### 9.3.3 Fauna Impact Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1: Loss and alteration of faunal habitat**<br><br>**Nature**: The habitat on site will change to a man-made environment, which could be used by very tolerant, generalist species that are accustomed to co-existing with humans. The loss of the habitat to fauna is more significant along the southern area (medium fauna species sensitivity) and along the Mogwase River (high fauna species sensitivity) where more fauna activity (droppings and tracks) was generally noted. the development will additionally cause loss of CBA2 and a very small ESA 1 in the far south-eastern corner. Finally, the habitat within the PA buffer Zones will be reduced.<br><br>Loss of habitat will only occur in the discrete footprints of the pylons along the powerline servitudes with some vegetation clearance and trimming along the lines.<br><br>**Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | **LOW** | STOP: Riverine areas should not be targeted for any physical development.<br>• At the site the riverine area must be extended to incorporate all the nearby rocky banks and ridges.<br>• Fires are not allowed as a means to implement vegetation maintenance along the powerline route once established.<br>MODIFY: Essentially the development of the entire site will achieve clustering, but development must proceed in a manner that will maintain development clusters adjacent to existing developments during all phases (start building near existing buildings and move outward – do not start new developments in open space). This will afford animals the time and freedom to move away from site.<br>• Target Pylons to be in line with existing pylons of adjacent servitudes (this will keep some continuity of the servitude areas between the pylons). Where possible, select areas devoid of bushveld or rocky habitats for pylons.<br>• Prioritise Very Low sensitivity areas (Plan 9) or areas within existing road servitudes or in existing powerline servitudes where bushveld has already been cleared for construction camps and storage areas.<br>• As per the animal species guidelines, MINIMISE activity in medium SEI areas (Plan 9). In terms of the site, the medium rating is considered an over-estimation for the greater area; regardless, it is recommended that 100m NO-GO buffers (minimum buffer for crocodiles as per guidelines) be added to the Mogwase River where it borders the site in the central and southern locations (northern section is already highly disturbed and / or developed) from the edge of the Highly sensitive area or the wetland (which provides the greater cumulative buffer). It is also recommended that the development within 100m of the drainage lines and within 100m of the NO-GO buffer be of lower density development (<60% hard-scaped), which will aid in maintaining open space and some associated ecological services and | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | reduce edge effects on the buffers.<br>• Consider green corridors for storm water drainage.<br>• Vegetation maintenance along the powerline route, once established, should focus on trimming the existing bushveld vegetation rather than removing the shrubs and scrubs where this is possible.<br>• CONTROL: Demarcate development areas and pylon areas as well as paths / tracks to these areas and maintain all activity in these areas only.<br>• Maintain areas of physical disturbance as small as possible to limit the area of disturbance.<br>• Maintain the existing indigenous trees within the open space and gardens (build around trees and patches of trees).<br>• REMEDY: Where areas not targeted for development and / or neighbouring areas are inadvertently impacted and / or damaged, clear any material dumped in the area, fill any excavation, and rehabilitate the site as soon as possible. | |
| **Impact 2:** Severing or impairing ecological corridors and loss of habitat connectivity<br><br>**Nature:** Development of the site with its proposed riverine buffers should not directly impair ecological connectivity significantly.<br>The powerline servitude proposes to cross the Seshabele River (Mogwase receiving river) near its confluence with the Elands River and also proposes to cross the Elands River in its western extent. Pylon placement in these riverine areas will not sever the ecological corridors, but could impair habitat within these areas.<br><br>**Residual Risks*:*** No significant residual impacts are expected | **MEDIUM** | STOP: No fencing is to be placed in any riverine area.<br>MODIFY: Where fencing is used adjacent to any open space then this fencing may not be electrified fencing. Palisade fencing should be prioritised over any wire-based fencing at open-space interfaces.<br>• Pylon placement must be planned to remain outside the riverine buffer zones (refer to wetland report) and should also avoid any rocky habitats along the banks of the rivers.<br>CONTROL: Ensure activity on site proceeds in a manner that provides fauna the opportunity to freely move off site, to prevent fauna from being trapped on site.<br>REMEDY: Where areas not targeted for development are inadvertently impacted and / or damaged, clear any material dumped and rehabilitate the site as soon as possible | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3:** Attraction of pests and exotic / alien species<br><br>**Nature:** The nature of the site means that several urbanised exotic and alien invasive species are likely to be present in the greater area and the development of the site could significantly alter the AI species dynamics if not appropriately managed.<br>The development of the powerline is not expected to significantly alter the AI species dynamics.<br><br>**Residual Risks*:*** Not attempting to control or preventing the worsening of alien invasive infestation will cause a decline in indigenous species. Altered population dynamics such as displacement of natural indigenous species by alien invasive species, can cause significant impact on overall fauna community structure, impacting further on ecological interactions, ecological services and natural food-chains | **MEDIUM** | • MODIFY: Maintaining and improving local indigenous populations could assist in reducing alien species numbers on site through competition. Therefore, maintain the indigenous habitat on site and within open spaces on site.<br>• CONTROL: Implement the municipal alien invasive management plan, including measures to prevent attracting additional alien fauna to site. This should include ensuring that all food and food waste, including domestic waste, is placed in sealed containers and not exposed on site and regularly removed from site through efficient waste removal services.<br>• REMEDY: Clear all domestic and food waste from site on a daily basis. | **LOW** |
| **Impact 4:** General destruction of fauna, including the ecologically significant species.<br><br>**Nature:** Habitat for the aquatic SCCs are unlikely to suffer significant direct impact. SCCs affiliated with bushveld habitats are over-exploited species not considered present in the area / the area is not considered a conservation area for these species. Impact probability to the more likely SCCs is considered low. Other TOP species could utilise the area, and monitoring and adaptive management must be established for these species.<br><br>**Residual Risks*:*** None expected if TOP species remain unaffected. | **MEDIUM** | • **STOP**: No poisons against fauna are to be brought on site; where this is not possible any substance that could be toxic to fauna will be stored and handled in a manner that will prevent exposure of the substance to the environment.<br>• No deliberate killing or trapping of indigenous fauna is allowed on site, unless trapping is done by a permitted specialist to remove the specimen from the area.<br>• Fires are not allowed to implement vegetation maintenance along the powerline route once established.<br>• Electrified fences are not allowed at interface with open space.<br>• **MODIFY:** Ensure safe speed limits and working conditions on the site.<br>• **CONTROL**: Ensure all contractors and staff on site are informed of the importance of TOP species through environmental awareness training and prevent any deliberate harm to any fauna, from invertebrates to mammals. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Alternative 2 (overhead powerline) is Preferred for Electrical Powerline installations.** | | • **REMEDY**: Contracts with contractors must specify actions that will be taken against contractors who do not conduct activities in line with the EMP.<br>• Generally monitor development and activity areas for potential TOPS. Should monitoring indicate that aspects of the development are posing a risk to these species if noted on site, then management must be adapted to protect these species (cease activities and wait for species to move off, employ permitted specialists to relocate species). | |
| **Impact 5:** Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste<br><br>**Nature:** All contaminating substances, including an friable materials, must be stored and handled properly on site to prevent contaminated and / or silt-loaded runoff from reaching downstream environments.<br><br>**Residual Risks** If toxic substances and waste are not properly handled or spills not cleared immediately, the environment will suffer extended residual impacts, particularly if toxins seep into the soils or are washed to downstream environments and impact is considered significant if not managed. | **MEDIUM** | • **STOP**: Discontinue use of all faulty machinery / equipment on site until properly repaired.<br>• No construction is to take place on site until such time that the necessary municipal services, including storm water management plans, are secured / approved in terms of town planning.<br>• **MODIFY**: Facilities will be provided for storage of all hazardous substances, waste, equipment and cement within the existing development areas (within the existing footprints of the substations) to prevent the exposure of these substances to the environment.<br>• If possible, completed pylon construction during the dry season. Otherwise implement local and temporary storm-water management within each footprint to prevent downstream sedimentation.<br>• **CONTROL**: All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks.<br>• All hazardous substances and waste must be properly stored and handled according to prescribed manner and must in no way be exposed to the environmental elements.<br>• Collect all waste from site before departing the area and dispose of appropriately.<br>• Cement bags will be stored under a tarpaulin and on an impervious sheet. Cement mixing will take place within a designated area only, preferably within the existing development footprint.<br>• **REMEDY**: All hydrocarbons spills on bare ground will be cleared immediately.<br>• Inspect and clear all litter and waste from the site and surrounds.<br>• All dry and wet cement spills on bare ground will be cleared immediately. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impact 1: Loss and alteration of faunal habitat**<br><br>**Nature**: The habitat on site will change to a man-made environment, which could be used by very tolerant, generalist species that are accustomed to co-existing with humans. The loss of the habitat to fauna is more significant along the southern area (medium fauna species sensitivity) and along the Mogwase River (high fauna species sensitivity) where more fauna activity (droppings and tracks) was generally noted. he development will additionally cause loss of CBA2 and a very small ESA 1 in the far south-eastern corner. Finally, the habitat within the PA buffer Zones will be reduced.<br><br>Loss of habitat will only occur in the discrete footprints of the pylons along the powerline servitudes with some vegetation clearance and trimming along the lines.<br><br>**Residual Risks:** Edge effects are expected through the operational maintenance activities, but are not considered as significant residual impacts due to the existing status of the site.. | **LOW** | • Maintain areas of physical disturbance as small as possible to limit the area of disturbance.<br>• Maintain the existing indigenous trees within the open space and gardens (build around trees and patches of trees).<br>REMEDY: Where areas not targeted for development and / or neighbouring areas are inadvertently impacted and / or damaged, clear any material dumped in the area, fill any excavation, and rehabilitate the site as soon as possible. | **LOW** |
| **Impact 2:** Severing or impairing ecological corridors and loss of habitat connectivity<br><br>Operational Phase – **no further impact expected** | | | |

| NATURE OF POTENTIAL IMPACT/RISK ON FAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3:** Attraction of pests and exotic / alien species<br><br>**Nature:** The nature of the site means that several urbanised exotic and alien invasive species are likely to be present in the greater area and the development of the site could significantly alter the AI species dynamics if not appropriately managed.<br>The development of the powerline is not expected to significantly alter the AI species dynamics. | **MEDIUM** | • Generally, monitor development and activity areas for potential TOPS. Should monitoring indicate that aspects of the development are posing a risk to these species if noted on site, then management must be adapted to protect these species (cease activities and wait for species to move off, employ permitted specialists to relocate species). | **LOW** |
| **Impact 4:** General destruction of fauna, including the ecologically significant species.<br><br>Operational Phase **– no further significant impact** expected as fauna would have either fled site or settled within the open spaces around site. | | | |
| **Impact 5:** Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste<br><br>**Nature:** All contaminating substances, including friable materials, must be stored and handled properly on site to prevent contaminated and / or silt-loaded runoff from reaching downstream environments.<br><br>**Residual Risks** If toxic substances and waste are not properly handled or spills not cleared immediately, the environment will suffer extended residual impacts, particularly if toxins seep into the soils or are washed to downstream environments and impact is considered significant if not managed. | **MEDIUM** | • REMEDY: All hydrocarbons spills on bare ground will be cleared immediately.<br>• Inspect and clear all litter and waste from the site and surrounds.<br>• All dry and wet cement spills on bare ground will be cleared immediately. | **LOW** |

### 9.3.4 Avifauna Impact Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1: Collision threat to flying waterbirds from power line linking the Manyane Substation to the proposed new northern substation.**<br><br>This power line should be marked with bird 'flappers' or spiral devices to reduce the risk of collisions with flying waterbirds where the line crosses the Mogwase River | **MEDIUM** | • Mitigation possible through marking of relevant stretch of power line with bird 'flappers'/spirals. | **LOW** |
| **Impact 2: Collision threat to flying waterbirds from Power line linking the SEZ zone to Ngwedi Substation.**<br><br>Three sections of power line which cross larger watercourses should be marked with bird 'flappers' or spiral devices to reduce the risk of collisions with flying waterbirds where the line crosses the Mogwase/Seshabele, Mankwe and Elands rivers | **MEDIUM** | • Mitigation possible through marking of relevant stretch of power line with bird 'flappers'/spirals. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3: Collision threat to flying waterbirds from power line linking the SEZ zone to Ngwedi Substation where this line is proposed to run just south of and parallel to the Sun City sewage works**<br><br>The proposed power line routed close to (south of) and parallel to the Sun City sewage works should also be marked with bird 'flappers'/spirals where it runs running parallel to the sewage works, i.e. a distance of about 750 m. | **MEDIUM** | • Mitigation possible through marking of the relevant stretch of power line (750 m) with bird 'flappers'/spirals. | **LOW** |
| **Impact 4: Routing of power line north of R556 road in the area just east of Sun City which separates it from existing power lines south of the road and places it closer to the Pilanesberg Nature Reserve/IBA**<br><br>It would appear preferable for the routing of the power line to be located south of the R556 road in the area just east of Sun City as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA. | **MEDIUM** | • Mitigation possible through marking of the relevant stretch of power line (750 m) with bird 'flappers'/spirals.<br>• **Specialist recommendations:** It would appear preferable for the routing of the power line to be located south of the R556 road in the area just east of Sun City as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA. See section 10.4.2 fo further details. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 5: Disturbance and habitat modification by routing the proposed water pipeline upgrade through an area without an existing pipeline corridor rather than through an existing corridor.**<br><br>Part of the proposed water pipeline upgrade should follow an apparent existing pipeline route rather than being routed through an apparent 'greenfields' route | **MEDIUM** | • Mitigation unlikely to be necessary as site quite distant from pipeline with other closer disturbances apparently not having a negative impact. Should mitigation become necessary it should involve distancing the pipeline construction from the site and/or timing construction when the site is inactive.<br>• **Specialist recommendations**: Part of the proposed water pipeline upgrade should follow an apparent existing pipeline route rather than being routed through an apparent 'greenfields' route | **LOW** |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impact 1: Collision threat to flying waterbirds from power line linking the Manyane Substation to the proposed new northern substation.**<br><br>This power line should be marked with bird 'flappers' or spiral devices to reduce the risk of collisions with flying waterbirds where the line crosses the Mogwase River | **MEDIUM** | • Mitigation possible through marking of relevant stretch of power line with bird 'flappers'/spirals. | **LOW** |
| **Impact 2: Collision threat to flying waterbirds from Power line linking the SEZ zone to Ngwedi Substation.**<br><br>Three sections of power line which cross larger watercourses should be marked with bird 'flappers' or spiral devices to reduce the risk of collisions with flying waterbirds where the line crosses the Mogwase/Seshabele, Mankwe and Elands rivers | **MEDIUM** | Mitigation possible through marking of relevant stretch of power line with bird 'flappers'/spirals. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON AVIFAUNA | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3: Collision threat to flying waterbirds from power line linking the SEZ zone to Ngwedi Substation where this line is proposed to run just south of and parallel to the Sun City sewage works**<br><br>The proposed power line routed close to (south of) and parallel to the Sun City sewage works should also be marked with bird 'flappers'/spirals where it runs running parallel to the sewage works, i.e. a distance of about 750 m. | **MEDIUM** | • Mitigation possible through marking of the relevant stretch of power line (750 m) with bird 'flappers'/spirals. | **LOW** |
| **Impact 4: Routing of power line north of R556 road in the area just east of Sun City which separates it from existing power lines south of the road and places it closer to the Pilanesberg Nature Reserve/IBA**<br><br>It would appear preferable for the routing of the power line to be located south of the R556 road in the area just east of Sun City as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA. | **MEDIUM** | • Mitigation possible through marking of the relevant stretch of power line (750 m) with bird 'flappers'/spirals.<br><br>**Specialist recommendations:** It would appear preferable for the routing of the power line to be located south of the R556 road in the area just east of Sun City as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA. See section 10.4.2 fo further details. | **LOW** |
| **Impact 5: Disturbance and habitat modification by routing the proposed water pipeline upgrade through an area without an existing pipeline corridor rather than through an existing corridor.**<br><br>Although the risk would appear low, care should be taken to ensure that the water pipeline upgrade does not result in any destruction/disturbance to this communal waterbird breeding colony | **MEDIUM** | • Mitigation unlikely to be necessary as site quite distant from pipeline with other closer disturbances apparently not having a negative impact. Should mitigation become necessary it should involve distancing the pipeline construction from the site and/or timing construction when the site is inactive.<br><br>**Specialist recommendations**: Part of the proposed water pipeline upgrade should follow an apparent existing pipeline route rather than being routed through an apparent 'greenfields' route | **LOW** |

### 9.3.5 Heritage & Palaeontological Impact Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1: Destruction of Burial sites**<br><br>**Nature:** Grave of young boy that died in 1932. There might be a second grave only marked with stones. This site is located inside the project area. Due to its location, it might be impacted on by the proposed power line development.<br><br>Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed. | **MEDIUM** | Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.<br>• ***If it is decided to retain the burial site, it should be fenced off permanently by means of a wire fence or brick wall, with a buffer zone of at least 20m.***<br><br>In the event of an impact occurring on the identified burial site, ***a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out***.<br>• The appropriate steps to take are indicated in Section 9 of the HIA report, as well as in the Management Plan: Burial Grounds and Graves, with reference to general heritage sites. | **LOW** |
| **Impact 2: Loss or damage to sites, features or objects of cultural heritage significance**<br><br>**Nature:** Heritage sites dating to historic times are found in the larger region, as well as in the project area. A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years. | **LOW** | Some of the heritage resources tend to occur below ground, therefore should graves, fossils or any archaeological artefacts be exhumed during construction, work on the area where the artefacts were found must cease immediately and it should immediately be reported to the police, ECO and heritage practitioner or local museum so that an investigation and evaluation of the finds can be made. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | | |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impact 1: Loss or damage to sites, features or objects of cultural heritage significance**<br><br>**Nature:**<br>Grave of young boy that died in 1932. There might be a second grave only marked with stones. This site is located inside the project area. Due to its location, it might be impacted on by the proposed power line development.<br><br>Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed. | **LOW** | The appropriate steps to take are indicated in Section 9 of the HIA report, as well as in the Management Plan: Burial Grounds and Graves, with reference to general heritage sites. | **LOW** |
| **Impact 2:** Loss or damage to sites, features or objects of cultural heritage significance<br><br>**Nature:** A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years | Negligible | None required. | Negligible |

### 9.3.6 Visual Impacts Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impact 1:** Severity of pipeline impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers:** Visual intrusion can be expected due to unsightly construction activities that will negatively interfere with the views of the observers along the pipeline route. The project activities will noticeably change the existing landscape features and introduce new features that are uncharacteristic to the visual environment. The main construction activities will include excavations done by earthmoving equipment and are expected to have a limited ZVI due to the high screening capacity of the vegetation cover. The occasional dust cloud may exceed the vegetation cover but is considered a temporary occurrence. More exposed views are expected along the R510 when construction occur along a busy road.<br>**Nature of impact on landscape character:** The construction phase will introduce new elements to the visual environment (i.e. construction equipment) that are otherwise uncharacteristic within the context of the landscape. The linear excavation will follow the existing pipeline route and will remain within the existing servitude. The existing vegetation cover in the servitude will be damaged/removed and will be temporarily replaced by an excavation and soil piles. Unsightly scarring of the landscape will negatively impact on the scenic quality of the visual resource | **MEDIUM** | **1. Reduction**<br>1.1. Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area.<br>1.2. Locate the lay-down area and construction camp in an area that is already disturbed or enclosed, for example at the Vaalkop Dam water treatment facility or Bodirelo Industrial area.<br>1.3. Develop the pipeline in short sections which can be backfilled quicker to reduce the duration of open excavations.<br>1.4. Implement dust suppression on dirt roads and at construction sites.<br><br>**2. Remediation**<br>2.1. Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility.<br>2.2. Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at regular intervals.<br><br>**3. Enhancement**<br>3.1. Rehabilitate the disturbed area as soon as possible to minimise the impact of exposed soil and re-establish a vegetation cover. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Residual Impacts:** Residual risks can likely occur if rehabilitation is unsuccessful and bare areas remain unvegetated. A risk of erosion or alien vegetation infestation can cause residual visual impacts, but can be effectively mitigated if a maintenance program is followed.<br><br>**Alternative 1 (underground powerline) is Preferred for Electrical Powerline installations.** | | | |
| **Impact 2:** Severity of SEZ impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers**: Visual intrusion can be expected due to unsightly construction activities that will negatively interfere with the views of the observers within the ZMVE of the SEZ. The project activities will noticeably change the existing landscape features and introduce new features that are uncharacteristic to the visual environment. The main construction activities will include services installation and bulk earthworks during the initial stages. The later construction activities will revolve around buildings and structures. Large areas are expected to be stripped of vegetation to make way for the development. A phased approach will be followed which will see smaller areas be developed over an extended timeframe. | **MEDIUM (OB)** | 1. **Avoidance**<br>1.1. Do not locate the construction camp or laydown yards within 1 km from any residential area unless it can be completely screened from sensitive viewpoints.<br>1.2. Its highly recommended to locate the construction camps and laydown yards at the existing Bodirelo Industrial area.<br>**2. Reduction**<br>2.1. Clearly demarcate the construction sites to limit the footprint of disturbance.<br>2.2. Keep dust levels down by regularly wetting dirt roads and exposed soil areas during active construction. This is especially relevant where new dirt roads are to be constructed.<br>2.3. Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.<br>2.4. Implement rehabilitation of disturbed areas as soon as possible to limit the duration | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Nature of impact on landscape character**: The construction phase will introduce new elements to the visual environment (i.e. construction equipment) that are otherwise uncharacteristic within the context of the landscape. The existing vegetation cover on the property will be damaged/removed and replaced by unsightly bare earth while construction continues. A noticeable change in the qualities of the landscape will occur which will translate into negative impacts on the scenic qualities.<br>**Residual Impacts:** Residual risks can likely occur if rehabilitation is unsuccessful and bare areas remain unvegetated. A risk of erosion or alien vegetation infestation can cause residual visual impacts, but can be effectively mitigated if a maintenance program is followed. | **HIGH (LC)** | of exposed soil surfaces. Monitor the rehabilitated areas for at least 12 months to ensure a sufficient vegetation cover is established that will prevent erosion from occurring.<br>2.5. Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area.<br>2.6. Maintain the height of buildings to maximum 2 storeys as this will be best absorbed in the character of the landscape.<br>**3. Remediation**<br>3.1. Keep the construction site neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.<br>3.2. Screen construction activities where possible. Temporary screening can be provided via a temporary shade cloth or corrugated iron fence to limit visual exposure of surrounding observers.<br>3.3. Plant perimeter trees during the construction phase in order to start with a program of vegetative screening. | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3:** Severity of Powerline impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers:** The construction activity will damage vegetation at the pylon locations and where new access roads are required. Construction sites are considered unsightly and will intrude on the views of observers inside the ZMVE. Initially the construction activity will be on ground level and vegetation screening will limit visibility. As the towers are erected, the ZVI will increase and more viewers will be affected.<br><br>**Nature of impact on landscape character**: The construction activity will damage vegetation at the pylon locations and where new access roads are required. These activities will negatively impact on the attributes of the landscape as it will remove or damage elements that contribute to the prevailing character of the landscape. The construction equipment, construction camps and workforce will be elements that are uncharacteristic to the visual environment. It will impact on the visual value and quality of the landscape character especially in the areas that are considered more natural. | **MEDIUM** | **1. Avoidance** 1.1. Do not locate the construction camp or laydown yards within 1 km from any residential area, unless it can be completely screened from sensitive viewpoints.<br>**2. Reduction** 2.1. Clearly demarcate the construction sites to limit the footprint of disturbance. 2.2. Keep dust levels down by regularly wetting dirt roads and exposed soil areas during active construction. This is especially relevant where new dirt roads are to be constructed. 2.3. Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site. 2.4. Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed soil surfaces. Monitor the rehabilitated areas for at least 12 months to ensure a sufficient vegetation cover is established that will prevent erosion from occurring. 2.5. Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area.<br>**3. Remediation** 3.1. Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints. 3.2. Enhance the screening capacity of the construction sites by erecting a temporary fence with a 3m high shade cloth to avoid the unsightly construction processes. | **LOW** |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impact 1:** Severity of pipeline impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers:** The completed pipeline will be underground | **HIGH** | **1. Avoidance**<br>1.1. Avoid these scenarios by implementing best-practise rehabilitation strategies which improve the success of vegetation establishment; | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| with the exception of the inspection holes protruding slightly above ground. This is expected to be no different to what the current scenario is and therefore no visual change is expected. Some disturbed areas may take longer to rehabilitate than others, which will cause some visual intrusion due to the unsightly nature of bare soil.<br>**Nature of impact on landscape character**: The completed pipeline will be underground with the exception of the inspection holes protruding slightly above ground. This is expected to be no different to what the current scenario is and therefore no visual change is expected. Some areas may remain bare soil if rehabilitation is not fully successful, but reestablishment of vegetation is expected to happen over time. | | **2. Monitoring and maintenance**<br>2.1. Monitor and maintain the pipeline servitude for at least 3 years to ensure proper rehabilitation of the disturbed footprint. | |
| **Impact 2:** Severity of SEZ impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers: The** completed SEZ will expand on the current industrial theme by filling the open spaces with infrastructure and buildings. Although the type of development is not unfamiliar or in stark contrast with the existing land uses, it will increase the dominance of the industrial theme as the aim is to develop a successful economic hub. The pleasant views over the existing open spaces will be replaced by the industrial and mixed-use developments which will alter the current views and may cause visual intrusion.<br><br>**Nature of impact on landscape character:** The completed SEZ will fill in and expand unto the open spaces that currently contribute to a rural and sparsely | **HIGH** | **1. Remediation**<br>1.1. Establish a philosophy that the development should be shrouded in vegetation and that more vegetation is visible than building facades, roofs, parking areas etc. Plant street trees and perimeter planting as soon as possible and appoint a horticulturist to guide on species. This will increase the screening capacity of the site from outside views. 1.2. Encourage all future property owners in the development to “green” their properties by implementing an incentive scheme or subsidising such initiatives. 1.3. Roof- and vertical gardens are relatively novel building features in South African architecture but has proven valuable on levels of urban ecology and micro-climatic control. Installation of such features will compensate for the loss in vegetation and reinstate some aesthetic appeal. 1.4. Maintain a character that provides for green open spaces and corridors into the development. 1.5. Avoid large bulky buildings with uninteresting facades. Instead, stagger and articulate the facades on horizontal and vertical planes to create shadow lines and to | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| developed residential and industrial character. The SEZ will expand on the existing industrial theme, thereby increasing the dominance of industrial infrastructure from ± 127ha to 1117ha. A loss of open space will occur and it is expected that the landscape character will be altered to a much larger developed area. | | reduce the perceivable mass of the buildings. A mixed palette of building materials that are well designed to create unity within diversity will also create interesting and varied patterns. 1.6. Avoid large open parking areas that are typically associated with shopping centres and offices. Consider basement parking for the majority of the facilities or introduce plenty of parking lot trees to minimise the visibility of hard surfaces. 1.7. Avoid obtrusive lighting of the development. Obtrusive lighting, otherwise known as light pollution, can range from glare to light spillage that causes a nuisance to surrounding viewers.<br>**2. Compensation** 2.1. Roof gardens, vertical gardens and the introduction of a large amount of internal and perimeter planting will compensate for the loss of vegetation.<br>**3. Enhancement** 3.1. Appoint Architects, Landscape Architects and/or Urban Designers to implement sound urban design principles and develop a masterplan for the area that is sensitive towards the environment. Implement principles to address, scale and proportion of spaces, responsiveness of these spaces in terms of its context, legibility of the user, variety to provide a rich experience, robustness of usage and creation of a unique identity. These are concepts promulgated by urban design theorists and should be further explored by a professional in the field. 3.2. The introduction of open water bodies is a certain way of increasing the aesthetic value of the site. The opportunity exists that storm water retention dams should be incorporated in the layout of the development to manage storm water effectively before being released into the Mogwase tributary. This is subject to a successful application for a water use license. | |

| NATURE OF POTENTIAL IMPACT/RISK ON VISUAL QUALITY | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 3:** Severity of Powerline impacts on observers (OB) and landscape character (LC)<br><br>**Nature of impact on observers:** The completed powerline will add another powerline to the visual environment and increase the visual dominance of the powerline corridor. Although it is considered compatible with the existing land use of linear power infrastructure, it will remain in contrast with the natural-farmland landscape character as it will exceed the height of the natural vegetation and interfere with views to other valued visual resources such as the Pilanesberg Mountains. This is particularly true for motorists travelling on the R556 and tourists visiting the Predator World and The Kingdom Resort. The visual clutter of powerlines will increase, which will detract from the scenic quality of the environment.<br>**Nature of impact on landscape character:** The completed project will add another powerline to a landscape that is already dominated by linear power infrastructure. It will detract from the value of the natural features such as the vegetation and views towards the mountainous backdrop, thereby affecting the scenic quality of the landscape.<br><br>**Residual Risks:** Residual risks can be effectively reduced if a drastic d implemented, in particular the consolidation of existing powerlines or undergrou not an option, residual risks will remain, as the powerline cannot be effecti remediation or reduction strategies. | **MEDIUM** | **1. Reduction 1**.1. Consider an underground cable. This will cause the least visual impact on the residents inside the ZMVE. 1.2. Consider consolidating multiple powerlines in one to avoid parallel running powerlines. 1.3. Keep to the minimum number of directional changes to limit the number of strain towers to be used. Strain towers are considered the most visually intrusive due to their larger visual footprint.<br>**2. Remediation** 2.1. Treat the steel members of the transmission towers with a low gloss, galvanized paint to mitigate the initial shiny appearance of a new tower. | **MEDIUM** |

### 9.3.7 Social Impact Assessment

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impacts 1: Increasing Regional Employment**<br><br>**Nature:** It is envisaged that when fully developed, the SEZ will deliver much needed development in the area by being the biggest single provider of employment in this region, and that it will significantly improve skill levels of the local population (Infraconsult Engineering, 2022). The development will require manpower for bulk infrastructure construction, operations and decommissioning activities. Livelihoods for contractors employed during construction and decommissioning of infrastructure will therefore be extended. In addition, local skilled people and competent businesses will be contracted during construction, operations and decommissioning of the SEZ buildings and infrastructure on site. Local people in the employable age group who qualify for the types of jobs on offer and are hired during these phases will benefit from employment. Among the companies the Bojanala SEZ aims to attract during its operations phase will be high technology national and international businesses that will require skilled workers.<br><br>**Residual Impacts:** The measures will increase the probability for employment in the regional community. However, there will be factors outside the control of the project, for example, not all people who will be trained and qualified will be able to be employed. Also, people may not be able to access jobs if they are not exposed to vacancy | **LOW** | **Enhancements**<br><br>In SIA consultations, the NWDC indicated management measures are being planned to promote employment in the region. These are discussed in this section, together with recommendations for additional measures.<br><br>• The SEZ will develop, in collaboration with the municipality and the mines, a common database of community structures including villages and community and business forums. The aim is to have an open engagement platform and develop one common database of current skills and retrenchments in the region. A stakeholder engagement official will be appointed to facilitate stakeholder engagement with the various structures and forums, and manage the database.<br><br>• The SEZ will coordinate required skills development for local people with the local Orbit Technical and Vocational Education and Training (TVET) college Mankwe Campus. If new technologies are being implemented in the SEZ, the local TVET college will be asked to plan accordingly for skills development, so that locals can be skilled for jobs using new technologies. It is envisaged that funding for training local people will come from the Department of Trade and Industry (DTI) and mines' Social and Labour Plans (SLPs).<br><br>• The SEZ has an SMME strategy, which will see the development of a database of current suppliers in the area. Preference will be given to local suppliers, and there will be provision for mentoring local businesses. Through this mechanism, locals will be employed. A manager will be employed to manage SMME procurement and development. | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| advertisements. Following decommissioning, securing alternative employment for retrenched staff will depend on the availability and accessibility of appropriate jobs. | | | |
| **Impacts 2:** Progressing Regional Economic Growth<br><br>**Nature:** The SEZ development will provide the infrastructure, including basic services to support economic development in the region. This include solar energy and battery storage for independent and reliable energy supply. The project will progress economic development through procurement and supply of goods and services during all phases of the development. Demand for goods and services will come from the SEZ, its service providers, and the SEZ industries, but also from the workers engaged in direct, indirect and induced jobs, and who will have more disposable income. Once the SEZ is established, it is expected that during operations the demand for goods and services from local, regional or national suppliers will increase. Moreover, an operational SEZ will supply goods and service to local, regional or national customers.<br><br>**Residual Impacts:** The SEZ will provide the infrastructure for industrial development, and support for new SMME development. Businesses such as new SMMEs will have to factor in a lag time before being profitable and fully operational. Even with support, there is no guarantee that all businesses will be successful and continue well into the operations phase. Businesses' adaptation to continue | **LOW** | • Operating businesses should not be disrupted during construction, operations and decommissioning activities of the SEZ. Continuity of basic services like water, and road access including for customers must be maintained. Visibility and advertising must also retain for operational businesses. There must be timely communications with existing businesses about any SEZ-related disruptions, and alternative solutions must be devised with businesses as necessary.<br>• A NWDC Project Steering committee has been set up, where all required utilities are represented to assess and deliver basic services using the District Development Model approach. The SEZ must continue during operations to monitor infrastructure effectiveness and efficiency (for e.g. solar power and batteries) for supporting the types of industries planning to be established in the SEZ. During decommissioning, the SEZ should look at how its infrastructure, such as capacity in the sewage works and landfill sites, can be transferred to other users, for example, the local municipality. This will be in alignment with the green recycling approach the DTI is promoting for the SEZ.<br>• The SEZ will develop, in collaboration with the municipality and the mines, a common database of community structures including villages and community and business forums. The aim is to have an open engagement platform for entrepreneurs, including those who want to set up businesses. A stakeholder engagement official will be appointed to facilitate stakeholder engagement with the various structures and forums. Through this forum, communities can engage with Development Finance Institutions (Development Bank of Southern Africa (DBSA); Industrial Development Corporation (IDC); and the Land and Agricultural Bank (LANDBANK)), | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| operating after decommissioning will depend largely on their capacity and actions. | | and the National Empowerment Fund (NEF). The stakeholder function should be retained throughout the lifespan of the SEZ, to monitor and address stakeholder recommendations, concerns, and grievances. It is also recommended that a formal grievance mechanism be instituted to respond efficiently and effectively, for the success of the SEZ during all phases.<br>• There is currently a Small Enterprise Development Agency (SEDA) business incubation centre on the SEZ site, which is open to all who are interested in starting a business. The availability of this facility must be advertised in the community, possibly through the ward councillors as a start. Marketing material from the centre should encourage more youth to be involved in business, and the centre should be capacitated to support development of SMMEs when interest in entrepreneurship grows in the community.<br>• A manager will be employed to manage SMME procurement and development. The SEZ has an SMME strategy, which will see the development of a database of current suppliers in the area. Preference will be given to local suppliers, and there will be provision for mentoring local businesses. Through this mechanism, locals will be employed. It is envisaged that funding for training SMMEs will come from the Department of Trade and Industry (DTI) and regional mines' Social and Labour Plans (SLPs). This is also a function that will serve the SEZ well if retained throughout its lifespan.<br>• The SEZ must identify what goods and services can be procured from the local area to support construction and decommissioning activities. Also, local recyclers should have access to materials from demolitions during construction and decommissioning phases. The green recycling approach in the DTI study for the SEZ must be implemented by the SEZ in all phases of the SEZ | |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impacts 3:** Decreased quality of Life<br><br>**Nature**: The project could potentially cause ill health and injuries on site to workers, suppliers, customers, and surrounding communities if there is increased exposure to health and safety risks during construction, operations and decommissioning. Moreover, as the development progresses it is expected that there will be more activity in the residential neighbourhoods surrounding the development, including from increased numbers of people and vehicles being in the area. The result will be pressure on current municipal infrastructure and services such as roads and traffic management. Moreover, if more people move into the area there will be greater demand for basic and social services such as water, electricity, sanitation, schools and medical facilities.<br><br>**Residual Impacts:** It is impossible to eliminate all health and safety risks. Risks to personal security, for example, can be managed but the threat is anticipated. Mitigation of these impact is therefore dependent capacity and efforts of businesses (through e.g. internal monitoring and evaluation, and private security) and government policing and response (e.g. for environmental compliance and community security) at the time of the incident. | **HIGH** | • Compliance with environmental laws will ensure that the SEZ is a welcome neighbour to residents in nearby Mogwase Township and tourism centres such as the Pilanesberg Nature Reserve, and in the region. The SEZ and its industries must be required to monitor and evaluate environmental compliance, and present results at frequent intervals (at least annually). The SEZ must have a protocol in place for investigations when there are signs of potential non-compliance (for e.g. in response to community complaints).<br>• According to the NWDC, the DBSA is the custodian of a Municipality Infrastructure Master Plan that is being developed for the Mogwase neighbourhood outside the SEZ. The NWDC maintains good relations with the BPDM and the MKLM, and community queries received through the municipal IDP process are referred to the NWDC. It will be important for these inputs from the community to be communicated to the DBSA so that they can be taken into account in the development and implementation of the Municipality Infrastructure Master Plan.<br>• Communities in the areas directly affected by or adjacent to the project site must be informed, before construction activities start, about the construction schedule and measures in place to<br>• reduce health and safety hazards, including a contact number and mechanism for recording and addressing grievances. The contractor and/ or developer must address all stakeholder concerns about safety and health timeously.<br>• The development site must be fenced off from the community, so that hazardous conditions can be managed within construction and demolition areas.<br>• The contractor must provide adequate water, sanitation, energy, and waste management facilities, and establish management measures to ensure that unsanitary conditions do not develop on the project site and the workers' accommodation camp. Arrangements must be made to transport and dispose of hazardous waste generated on site to ensure legal | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | compliance.<br>• Dust must be controlled by the contractor through abatement measures such as watering roads and controlling traffic speed. Exposed stockpiles such as building sand must be adequately covered and placed on site taking into consideration prevailing wind conditions. It is assumed that dust impacts have been assessed in the environmental study, and other relevant management measures have been included in the overall EMP.<br>• All workers should be required to abide by rules for responsible conduct so as not to endanger lives onsite or in its neighbourhood.<br>• Health promotion to construction workers must include awareness of the risk to contract or spread HIV/ AIDS. Condoms should be available for free to workers.<br>• It is assumed that a traffic study has assessed potential traffic risks during all three phases of the development, and management measures recommended will be instituted to reduce the risks identified.<br>• ● It is also assumed that the environmental study has assessed the potential noise impact, and recommended measures to manage it.<br>• ● Clear signage at the gate will assist in communicating the availability/ non-availability of jobs to job seekers. A security company should secure the site and be trained to amicably address any queries from job-seekers at the gate, or potential security incidents in the project area. The security company can put in place arrangements with other security companies and the local South African Police Services (SAPS) police station where additional support is required for managing security incidents.<br>• ● A protocol should be in place that will institute immediate action during an emergency that is life-threatening, such as a fire or vehicle accident. | |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impacts 4:** Social and Economic Displacement<br><br>**Nature**: The potential impact will be experienced in the footprint of the SEZ buildings and bulk infrastructure, as well the servitudes and additional sites for construction work required along the linear electricity transmission lines and water pipes.<br><br>**Residual Impacts:** People conducting economic activities on the SEZ site who will have to move out may not find alternative locations to continue with livelihood activities (e.g. grazing cattle or for crop farming). They may experience economic hardships. The SEZ must therefore identify any vulnerable people and refer them to the applicable authority (e.g. MKLM) for assistance. | **MEDIUM** | • It is recommended that at least 6 months prior to the start of retrenchments, employees must be informed about the retrenchments, and encouraged and supported to apply for alternative employment.<br>• Unemployment Insurance Fund (UIF) payments must be up to date always, and employees must be informed about the procedure to access these funds if they are eligible to do so.<br>• Staff must be paid retrenchment packages as per the legal requirement.<br>• The skills and retrenchments databases must be up to date, so that details of retrenched skilled staff can be easily accessed by other industries such as mining operations in the area.<br>• Counselling and training be provided for anxiety management, financial management, and how to reskill or apply for new employment. | **LOW** |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impacts 1: Increasing Regional Employment**<br><br>**Nature:** It is envisaged that when fully developed, the SEZ will deliver much needed development in the area by being the biggest single provider of employment in this region, and that it will significantly improve skill levels of the local population (Infraconsult Engineering, 2022). The development will require manpower for bulk infrastructure construction, operations and decommissioning activities. Livelihoods for contractors employed during construction and decommissioning of infrastructure will therefore be extended. In addition, local skilled | **MEDIUM** | **Enhancements**<br><br>In SIA consultations, the NWDC indicated management measures are being planned to promote employment in the region. These are discussed in this section, together with recommendations for additional measures.<br><br>• The SEZ will develop, in collaboration with the municipality and the mines, a common database of community structures including villages and community and business forums. The aim is to have an open engagement platform and develop one common database of current skills and retrenchments in the region. A stakeholder engagement official will be appointed to facilitate stakeholder engagement with the various structures and forums, and manage the database. | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| people and competent businesses will be contracted during construction, operations and decommissioning of the SEZ buildings and infrastructure on site. Local people in the employable age group who qualify for the types of jobs on offer and are hired during these phases will benefit from employment. Among the companies the Bojanala SEZ aims to attract during its operations phase will be high technology national and international businesses that will require skilled workers.<br><br>**Residual Impacts:** The measures will increase the probability for employment in the regional community. However, there will be factors outside the control of the project, for example, not all people who will be trained and qualified will be able to be employed. Also, people may not be able to access jobs if they are not exposed to vacancy advertisements. Following decommissioning, securing alternative employment for retrenched staff will depend on the availability and accessibility of appropriate jobs. | | • The SEZ will coordinate required skills development for local people with the local Orbit Technical and Vocational Education and Training (TVET) college Mankwe Campus. If new technologies are being implemented in the SEZ, the local TVET college will be asked to plan accordingly for skills development, so that locals can be skilled for jobs using new technologies. It is envisaged that funding for training local people will come from the Department of Trade and Industry (DTI) and mines' Social and Labour Plans (SLPs).<br>• The SEZ has an SMME strategy, which will see the development of a database of current suppliers in the area. Preference will be given to local suppliers, and there will be provision for mentoring local businesses. Through this mechanism, locals will be employed. A manager will be employed to manage SMME procurement and development. | |
| **Impacts 2:** Progressing Regional Economic Growth<br><br>**Nature:** The SEZ development will provide the infrastructure, including basic services to support economic development in the region. This include solar energy and battery storage for independent and reliable energy supply. The project will progress economic development through procurement and supply of goods and services during all phases of the development. Demand for goods and services will come from the SEZ, its service providers, and the SEZ | **MEDIUM** | • Operating businesses should not be disrupted during construction, operations and decommissioning activities of the SEZ. Continuity of basic services like water, and road access including for customers must be maintained. Visibility and advertising must also retain for operational businesses. There must be timely communications with existing businesses about any SEZ-related disruptions, and alternative solutions must be devised with businesses as necessary.<br>• A NWDC Project Steering committee has been set up, where all required utilities are represented to assess and deliver basic services using the District Development Model | **MEDIUM** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| industries, but also from the workers engaged in direct, indirect and induced jobs, and who will have more disposable income. Once the SEZ is established, it is expected that during operations the demand for goods and services from local, regional or national suppliers will increase. Moreover, an operational SEZ will supply goods and service to local, regional or national customers.<br><br>**Residual Impacts:** The SEZ will provide the infrastructure for industrial development, and support for new SMME development. Businesses such as new SMMEs will have to factor in a lag time before being profitable and fully operational. Even with support, there is no guarantee that all businesses will be successful and continue well into the operations phase. Businesses' adaptation to continue operating after decommissioning will depend largely on their capacity and actions. | | approach. The SEZ must continue during operations to monitor infrastructure effectiveness and efficiency (for e.g. solar power and batteries) for supporting the types of industries planning to be established in the SEZ. During decommissioning, the SEZ should look at how its infrastructure, such as capacity in the sewage works and landfill sites, can be transferred to other users, for example, the local municipality. This will be in alignment with the green recycling approach the DTI is promoting for the SEZ.<br>• The SEZ will develop, in collaboration with the municipality and the mines, a common database of community structures including villages and community and business forums. The aim is to have an open engagement platform for entrepreneurs, including those who want to set up businesses. A stakeholder engagement official will be appointed to facilitate stakeholder engagement with the various structures and forums. Through this forum, communities can engage with Development Finance Institutions (Development Bank of Southern Africa (DBSA); Industrial Development Corporation (IDC); and the Land and Agricultural Bank (LANDBANK)), and the National Empowerment Fund (NEF). The stakeholder function should be retained throughout the lifespan of the SEZ, to monitor and address stakeholder recommendations, concerns, and grievances. It is also recommended that a formal grievance mechanism be instituted to respond efficiently and effectively, for the success of the SEZ during all phases.<br>• There is currently a Small Enterprise Development Agency (SEDA) business incubation centre on the SEZ site, which is open to all who are interested in starting a business. The availability of this facility must be advertised in the community, possibly through the ward councillors as a start. Marketing material from the centre should encourage more youth to be involved in business, and the centre should be capacitated to support development of SMMEs when interest in entrepreneurship grows in the community.<br>• A manager will be employed to manage SMME procurement and development. The SEZ has an SMME strategy, which will see the development of a database of current suppliers in the | |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | area. Preference will be given to local suppliers, and there will be provision for mentoring local businesses. Through this mechanism, locals will be employed. It is envisaged that funding for training SMMEs will come from the Department of Trade and Industry (DTI) and regional mines' Social and Labour Plans (SLPs). This is also a function that will serve the SEZ well if retained throughout its lifespan.<br>• The SEZ must identify what goods and services can be procured from the local area to support construction and decommissioning activities. Also, local recyclers should have access to materials from demolitions during construction and decommissioning phases. The green recycling approach in the DTI study for the SEZ must be implemented by the SEZ in all phases of the SEZ | |
| **Impacts 3:** Decreased quality of Life<br><br>**Nature**: During operations, impacts from dust can persist following the construction and decommissioning phases if the project site is not adequately rehabilitated. Traffic, noise and waste will have to be managed during all phases of the development. Steps will also have to be taken to reduce the risk of fire, threats to personal security for staff, suppliers and customers, and protect infrastructure from criminal activity.<br><br>**Residual Impacts:** It is impossible to eliminate all health and safety risks. Risks to personal security, for example, can be managed but the threat is anticipated. Mitigation of these impact is therefore dependent capacity and efforts of businesses (through e.g. internal monitoring and evaluation, and private security) and government | **HIGH** | • Implementation of the Municipality Infrastructure Master Plan, which should include provision and maintenance of municipal services and responding to affordable housing needs. The adequacy of these and social services such as education and health facilities should be monitored over the SEZ operations, to mitigate any pressure from a growing SEZ operations, and to ensure that socially and economically thriving communities are created that will support the SEZ. A grievance mechanism should be in place where potential risks can be lodged by neighbours or other stakeholders and addressed amicably with the SEZ, to maintain good relations with SEZ neighbours.<br>• Warning signs explaining the dangers of tampering with Eskom towers and water infrastructure must be understood by community members (e.g. by using pictures and symbols) and placed where they are visible. They must include the service providers' contact numbers that problems can be reported to. Ongoing maintenance to include checking whether warning signs are intact and whether infrastructure has been tampered with.<br>• The SEZ must make provisions for training staff on firefighting, first aid, emotional intelligence, | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON SOCIAL | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| policing and response (e.g. for environmental compliance and community security) at the time of the incident. | | and conflict resolution skills. A protocol should be in place that will institute immediate action during an emergency that is life-threatening, such as a fire or vehicle accident.<br>• It is assumed that the SEZ will assess risks in the project site and neighbouring area before and during operations, to identify and institute any measures to manage any additional community health and safety risks not identified by this SIA. It is assumed that Closed Circuit Television (CCTV) and services from a security company will be among the measures that will be instituted to safeguard personal security of staff, suppliers and customers. | |

### 9.3.8 **Air Quality & Odour Impacts**

| NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **No anti applicable during construction** | | | |
| **OPERATIONAL PHASE IMPACTS** | | | |

| NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impact 1:** Dust fall, odours and HAPs emissions from construction activities associated with the proposed expansion of the WWTP<br><br>**Nature:**, where a phased construction approach will be used. These emissions will be short-term but can be easily mitigated with the implementation of dust control measures summarised on pg 101 of Appendix E9<br><br>Dust fall, odours and HAPs are key pollutants of concern associated with existing and proposed activities at the project site. Details on mitigation measures currently in place to promote a reduction in odours and HAP emissions at the existing landfill sites and WWTP within the proposed SEZ were not known at the time of this study. Therefore, the following mitigation measures are recommended for the operational phase (current and proposed) of the project where possible (depending on feasibility and affordability), | **MEDIUM** | • The use of covers is recommended at the WWTPs' primary sedimentation tanks for effective odour control;<br>• Maintain a complaints registry, where odour complaints are recorded. The registry should also indicate the person assigned to the investigation, its outcome and the rectification measures, if applicable;<br>• The WWTP units must be maintained in good running condition and inspected on a weekly basis;<br>• Storage of sludge and products at the WWTPs should be minimized to reduce odour impacts;<br>• Screens and/or grit at the WWTPs should be cleaned regularly to reduce the odour potential;<br>• Alarms and notification circuits should be installed at all critical components that may have a significant effect on the efficiency of the WWTP units, such as delivery pumps, chemical injection pumps, aeration blowers, filters, etc;<br>• Effluent must be maintained in aerobic conditions, other than in processes which are specifically anaerobic;<br>• WWTP overflow must be cleaned up immediately to avoid environmental harm and odour releases; and<br>• Establish operational and control measures for normal, as well as abnormal conditions that minimise odours. The following should be addressed:<br>o Identification of activities which produce the odour and the point of odour release.<br>o Possible process or control failures or abnormal situations.<br>o Potential outcome of a failure in respect of the likely odour impact on local sensitive receptors.<br>o Actions to be taken to mitigate the episode, timescales and details of the persons responsible for the actions at the site.<br>o Record keeping. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | • Use of trickling biofilter systems at the WWTPs. In primary waste water treatment, biofiltration is used to control levels of biochemical oxygen demand, chemical oxygen demand, and suspended solids; and<br>• Use of a nitrate recycling system used WWTPs for the removal of nitrates from the waste water during treatment. | |

9.3.9 **General Impact**

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS** | | | |
| **Impacts 1: Traffic Impacts**<br>• The general load will comprise building materials such as concrete and reinforcement, and structural steel. The proposed project will only have limited increase (i.e. construction vehicles for delivery of materials and clearing/ excavation) in traffic during the construction phase.<br>• During the construction phase there will be an increase in traffic along existing roads that border the proposed SEZ as well as within the general area of Mogwase.<br>• This may result in an increase in traffic congestion within the site area | **MEDIUM** | • During the planning and design appropriate planning should take place for the increased traffic to, from and within the SEZ.<br>• The Traffic Impact Study (TIS) must be submitted to the Moses Kotane Local Municipality (MKLM) for their perusal with the complete development proposal, and that the MKLM in turn forward the TIS, with their comments, to the South African National Roads Agency Limited (SANRAL) for their perusal.<br>• All final road design drawings will need to be submitted to the relevant road authority officials prior to construction.<br>• Refer to the traffic impact assessment study for recommendations for internal road reticulation, parking and loading facilities,<br>• vehicular access onto existing main roads, pedestrian and bicycle<br>• access, access control, traffic | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| **Impacts 2: Noise Impacts**<br>• During the construction phase, construction activities associated with sub-soil works (compaction soils, trenching etc), concrete pouring, development of internal roads (excavations and grading by noisy construction vehicles) and carnage required to move large equipment and components will result in noise pollution.<br>• During the construction phase, construction activities may need to take place outside of normal working hours which could cause a nuisance to surrounding communities.<br>• As more development establish in the area there is a possibility that the ambient noise levels may change from that of agriculture/residential area to mixed use developed area.<br>• Increase in noise pollution due to, among others, excavations and site clearing, noise from construction vehicles and construction staff and or drilling activities.<br>• Noise pollution caused during construction could potentially be a nuisance to neighbouring residential areas. | **MEDIUM** | • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays only.<br>• If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.<br>• No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.<br>• Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc) must be used as per operating instructions and maintained properly during site operations.<br>• Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.<br>• Good working relationship and communication channels between project representative and potentially sensitive receptor needs to be established to ensure prior notice to work taking place close to them. | **LOW** |
| **Impacts 3: Impact on other existing services**<br>• The project area is in a semi built up and there are few services that are expected on site,<br>• Services, which are expected on site, inter alia are:<br>• Sewer and water reticulation networks and associated infrastructure<br>• Stormwater drainage infrastructure<br>• Trees and vegetation | **MEDIUM** | • Wayleave applications have been submitted with all affected service utilities. Information so gathered will allow services layouts to be added onto the construction drawings for the contractor's information during construction.<br>• Furthermore, the wayleave conditions will be assembled in a package for the contractor to submit to Local Municipality and SANRAL for the master wayleave application. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| | | | |
| **OPERATIONAL PHASE IMPACTS** | | | |
| **Impacts 1: Traffic Impacts**<br>• Anticipated impact on traffic owing to construction vehicles and heavy vehicles delivering materials to the site.<br>• Traffic congestion in and around the area may offend neighbouring property owners during the construction phase. | **LOW** | All signage and road markings for the proposed site should be in accordance with the South African Road Traffic Signs Manual" | **LOW** |
| **Impacts 2: Noise Impacts**<br>During the operation phase, the different types of industries will produce different sound pressure levels. The light industrial zones may cause only levels of noise. The medium industry will likely cause moderate to high noise generating capacities associate with heavy vehicles such as ADT, conveyor belts units, drive train units and pressing/moulding units. The heavy industry requires noisy equipment with associated high noise levels. During the operation phase there may be an increase in noise levels in the general area as a result of | **MEDIUM** | • Pre-planning phase mitigation options must be adhered to<br>• An acoustical measurement and audit programme is recommended to be conducted during the first year of operations. The measurement report will enable the developer to ensure mitigation options selected will be successful.<br>• Construction activities must be restricted to normal working hours as far as possible.<br>• Receptors proposed for the SEZ (such as business, educational or hospitality facilities) should be implemented after major construction works have been completed. Surrounding buildings to these receptors should be in their finishing phase and not concrete phase where heavy equipment is required.<br>• Good working relationship and communication channels between project representative and potentially sensitive receptor needs to be established to ensure prior notice to work taking place close to them. | **LOW** |

| NATURE OF POTENTIAL IMPACT/RISK ON CULTURAL HERITAGE | SIGNIFICANCE (WITHOUT MITIGATION) | PROPOSED MITIGATION | SIGNIFICANCE (WITH MITIGATION) |
|---|---|---|---|
| increase traffic volume and speeds and types of vehicles required for each industry (such as trucks). | | | |
| **Impacts 3: Risks of Fires & Explosions**<br>• Storage, handling and transportation of fuel are potentially dangerous to humans and properties due to the risk of fire and explosions.<br>• There is considerable movement of cars and other vehicles on the forecourt which could lead to accidental collision with structures, people and other vehicles.<br>• Obstructed exits e.g. by stock and/or accumulations of packaging can prevent escape and provide fuel for fires | **MEDIUM** | • Devise a safe system of traffic movement, e.g. a one-way system for entering and exiting the forecourt.<br>• Display clear information/warning signs setting out the traffic control arrangements.<br>• Provide sufficient designated parking areas close to the shop and away from the pumps.<br>• Provide mechanical protection to vulnerable structures such as fuel tanks and liquified petroleum gas (LPG) storage areas.<br>• Keep all escape routes and fire exits clear and make regular checks to ensure that this is the case.<br>• Clear rubbish regularly (remember sand used for cleaning or containing petrol spills will be flammable and should be disposed of safely, by a hazardous waste disposal company if necessary)<br>• Storage tanks and dispense pumps are adequately maintained and monitored<br>• Appropriate wet stock management procedures are used<br>• Identify hazardous areas and control all sources of ignition - use appropriate warning and hazard signs.<br>• Fire extinguishers must be easily accessible and all vehicles should have fire extinguishers.<br>• Ensure all staff are adequately trained (retain training records); Employees should be trained on fire safety and there should be fire marshals.<br>• Local emergency fire brigade number should be known to everybody<br>• The prescribed fire safety precautions in terms of the Occupational Health and Safety Act must be adhered to. | **LOW** |
| **Impacts 4: Stormwater Management**<br><br>During the operation phase, inadequate stormwater infrastructure may result in soil erosion and sedimentation of nearby watercourses. | **MEDIUM** | • All stormwater management measures and infrastructure must be properly maintained and monitored.<br>• If stormwater measures that have been put in place prove to be inadequate then new or additional stormwater infrastructure and measures must be put in place. | **LOW** |

## 9.4 Do Nothing Alternative Assessment

The no-go alternative for this project would entail continuation of the status quo. The following negative impacts would result:

- There will be no economic boost in the region which would have fed into the agro-processing, services and tourism sectors;
- The anticipated job and skills development opportunities the project presents will not be generated as the project would have sourced 60% of the required plant and machine operators locally;
- There will be a derailment in the proposed strategies for the Bojanala District Municipality's Strategic Planning and IDPs;
- There will be underutilisation of the available land which could otherwise be productive and beneficial to the local communities and the Local Municipality as they are the landowners; and
- There will be a derailment in the intended progress as mandated by strategic projects as spelled out by the NDP.
-

Although the no-go alternative sees the continuation of the status quo and leads to missed opportunities, there are positive impacts it provides. These include:

- All negative impacts discussed in Section 8 of this report are avoided if this alternative is choses;
- There will be a conservation of the wetland bodies and the related ecosystems observed on the site;
- There will be a preservation of the hydrology and geohydrological nature of the site;
- There will be a protection on the related environmental sensitivities on the site including the biodiversity; and
- There will be a potential to preserve any heritage and paleontological resources in the area as the site is flagged as a high-risk area for paleontological resources

## 9.5 Cumulative Impacts Assessment

There are other existing power lines in the vicinity of the project site, in addition, a railway line runs within the site and the Provincial road (R510) runs parallel to the eastern boundary of the property.

The potential direct cumulative impacts associated with the SEZ are expected to be from vegetation clearance and impact on water resources, on the Bulk services (i.e. power line) are mostly expected to be associated predominantly with the potential visual impact and potential impacts on avifauna during operation. The significance of the cumulative impacts can only be adequately assessed once alternative routes/corridors are available for assessment, and will be considered in the detailed specialist studies to be undertaken in the EIA phase of the process.

Significant cumulative impacts that could occur due to the development of the SEZ and its associated infrastructure in proximity to each other include impacts such as:

- Aquatic and Wetland Impacts

- Loss of vegetation and impacts on ecology
- Impacts on avifauna
- Visual impacts
- Social impacts
- Air quality impacts

**Aquatic and Wetland Impact Assessment**

- **Changes in water flow regime:** Some changes in the hydrology of the rivers could occur due to ineffective sediment control during the construction phase and stormwater management during the operational phase
- **Changes in sediment regimes** Expected to be moderate to low. Should mitigation measure not be implemented effectively, sediment deposition may affect the capacity of downstream watercourses and may cause flooding. Reversing this process is unlikely and should be prevented in the first place.
- **Introduction and spread of alien vegetation**. Cumulative impacts include further infestation of alien plants. Regular monitoring should be implemented during construction, rehabilitation including for a period after rehabilitation is completed.
- **Loss and disturbance of watercourse** Expected to be low since the development footprint lies well outside the delineated wetlands contribute to regional water quality decrease, therefore should be considered a significant cumulative impact
- **Changes in water quality** Expected to be low given that standard best practice is followed during construction
- **Loss of aquatic biota -** Further loss of the aquatic biota

**Vegetation Impact Assessment**

Erosion of the development footprint upslope from the watercourses could increase sedimentation However, this could be mitigated. Increase in alien invasive species in the Mogwase area. There is possible bush densification around the site and loss of indigenous species diversity – mainly due to a lack of fire and grazing. If mitigation measures are not strictly implemented, erosion of the development area, contamination of ground water and the spread and establishment of invasive species can take place. This will lead to the increase in modified areas and fragmentation of natural vegetation. Failed rehabilitation and soil compaction associated with the development could lead to a cumulative invasion by alien invasion plant species from the surrounding transformed vegetation that can easily spread into the compacted soils. Generally, if mitigation measures are adequately implemented, no cumulative impacts are expected.

**Fauna Assessment**

The disturbed nature of the area and the limited terrestrial fauna activity means that cumulative impacts are considered negligible in terms of habitat loss in the specific area.

Cumulative loss of habitat in the PA buffer zone will exacerbate the impact to the PA by increasing risk of fatality to dispersing species, but also, secondarily, isolating the populations within the reserve. As the site is largely between existing developments the impact is lessened, but the the Bojanala EMF should address the integral areas for conservation and activity restrictions as may be relevant to the site and MUST be consulted and complied with in terms of the final development plan for the site. Also, any recommendations regarding activities within the PA buffer zones, as stipulated in the PA's EMP, MUST be adhered to.

**Visual Assessment**

A risk of cumulative impacts is likely as the development is considered a large-scale project and negative impacts can easily compound if mitigation measure is not focussed on the sources of impact. A very high risk of cumulative impacts is likely as the powerline route is also shared with other existing powerlines in one corridor. The proposed powerline will be increasing the visual dominance of powerline infrastructure thereby negatively affecting views towards valued landscape features. Cumulative impacts can be effectively reduced with the implementation of drastic design alterations.

**Avifauna Assessment:**

WWTP: This component when potentially coupled with further wetland and waterbird habitat loss at the western existing WWTP site could have potential cumulative impacts. These would be relatively low in significance though as neither wetland is natural. This component when potentially coupled with further collision risks from other power lines associated with the project could have potential cumulative impacts.

**Air Quality & Odour Impacts**

There is no data available to determine background ambient air quality concentrations for the various pollutants assessed in this AQIA. However, it is noted that the HAPs from the existing and proposed landfill sites and WWTPs would certainly contribute to background concentrations of air pollutants and odour in the area and provide cumulative impacts. The cumulative impact of these would eventually decrease overtime after closure of the facilities.

**In General:** The local area is fairly developed with various industrial clusters, roads and medium density urban areas already occurring. Generally, the cumulative impact is rated as Low fort the larger part of the project as it falls within developed areas. However, for the powerline component when potentially coupled with further collision risks from other existing power lines in the project this could have a potential medium significance cumulative impact. Also the wetland area is expected to be of medium significance should mitigation measure not be implemented as changes made to the bed or banks of watercourse and unstable channel conditions may result causing erosion, meandering, increased potential for flooding and movement of bed material, which will result in property damage adjacent to and downstream of the site. Reversing this process is unlikely and should be prevented in the first place.

# 10 CONCLUSIONS AND RECOMMENDATIONS

In terms of APPENDIX 3(3)(1) of the EIA Regulations (2014) (amended 2017), an Environmental Impact Assessment Report must include:

**(l) An environmental impact statement which contains –**

(i) A summary of the key findings of the environmental impact assessment;

(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint of the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and

(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

**(m) Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;**

**(n) The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified throughout the assessment;**

**o) Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.**

**(p) A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;**

**(q) A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;**

**(r) Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;**

**(s) An undertaking under oath or affirmation by the EAP in relation to-**

- The correctness of the information provided in the reports;
- The inclusion of comments and inputs from stakeholders and I&APs;
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;

The previous chapters of this report together with the specialist studies contained within **Appendix E** provide a detailed assessment of the potential impacts that may result from the proposed project. This chapter concludes the undertaken Environmental Impact Assessment (EIA) process for the proposed Development of the **Bojanala Special Economic Zone (SEZ) and associated infrastructures** (as summarised in section 2.2.3 of this report) by providing a summary of the conclusions of the assessment. In so doing, it draws on the information gathered as part of the EIA process and the knowledge gained by the environmental specialist consultants and presents an informed opinion of the environmental impacts associated with the proposed project. Potential impacts which could occur as a result of the proposed project are summarised in the sections which follows.

## 10.1 Summary of the key findings & impacts

The specialist findings are summarised as follows:

### Aquatic and Wetland:

Numerous watercourses were identified during the site visit. Some of the watercourses within the SEZ exhibit wetlands feature due to impoundments and other anthropogenic impacts. However, from historical imagery these are transformed streams and rivers with a large loss of woody vegetation. The remaining watercourses are all predominantly rivers and streams ranging from 1st to 5th order. The hydroperoid of the watercourses also range from the dominant Non-Perennial Episodic and Ephemeral streams to some larger Perennial Streams such as

the Elands River. It is important to note that all the watercourses ultimately drain into the Elands River and any impacts will have effects downstream in the Elands River. Although some **differences occur within the individual watercourses the dominant vegetation of the region occurs in these watercourses. Most of the watercourses were minimally impacted although scores ranged from B (Largely natural with few modifications**. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged) to D (Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred).

**Terrestrial Biodiversity (vegetation)**

**Development site:** The vegetation on the proposed development site comprised open to closed mixed bushveld, albeit dominated by microphyllous, thorny tree species. Varying degrees of past and current disturbances were noted and encroacher species such as *Dichrostachys cinerea* (sickle-bush) formed dominant stands in some parts of the site. Broad-leaved species were more prominent on deeper sands on the south-western corner of the site. Riparian vegetation was dominated by the tree *Searsia lancea* (karee), while clayey drainage lines included a high frequency of the encroacher tree *Senegalia mellifera* subsp *detinens* (black thorn). Some moist grassland on clay, with a low frequency of trees, was also delineated. Although several provincial protected species, as well as national protected trees were recorded, no plant species of conservation concern were observed. However, suitable habitat for two (2) Near threatened species were present.

The assessment found that most of the site comprised natural bushveld that has been degraded somewhat by bush densification. According to the North West Biodiversity Sector Plan ((North West Department of Rural, Environment and Agricultural Development (READ), 2015), the site falls largely within a CBA2. The land use objective in a CBA2 should be to maintain the land in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process. However, development on the site will destroy mixed bushveld ranging from good condition bushveld to densely encroached areas. This will reduce the extent of the CBA2 about 900ha. Although the site falls within a CBA2, there are options for loss of some components of biodiversity in CBA2 landscapes without compromising the ability to achieve biodiversity targets (North West Department of Rural, Environment and Agricultural Development (READ), 2015). This report recommends that wide, naturally vegetated corridors be retained around riparian areas and drainage lines (at least 200m from the edge of the river or drainage line). Naturally vegetated open spaces must be retained in the development that connects to the riparian areas and drainage lines. This will ensure that some ecological function and corridors are preserved. Also, if the Near threatened plants species for which suitable habitat is present are located during follow-up assessments, they could be conserved within these open spaces. The open spaces should be managed to prevent bush densification, tree harvesting, and degradation

**Linear infrastructure: Powerline and pipeline routes:** Various vegetation groups were recorded along the proposed linear infrastructure corridors. Mixed-bushveld was the most dominant vegetation type, while *Senegalia mellifera-Tarchonanthus camphoratus* bushveld and wooded grassland occurred in the western extent of the proposed powerlines. Riparian vegetation was dominated by the tree *Searsia lancea* (karee).

The linear infrastructure may fragment fauna habitat; however, vegetation can regrow and can rehabilitate well. Contractors must manage edge effects and prevent, monitor and rehabilitate negative impacts into adjacent vegetation. The implementation of a rehabilitation and monitoring plan to ensure that the vegetation is retuned to sustainable bushveld post construction must be implemented.

The greatest impact of the construction of the powerlines and pipelines are the removal of vegetation where the pylons and trenches are to be placed, as well as vegetation clearing and trampling within the servitude. Clearing of vegetation could result in a direct impact on the habitat of or species of conservation concern, while indirect impacts such as soil compaction and soil erosion are highly likely. The potential impacts will be more severe in the sensitive vegetation groups (medium SEI), whereas impacts in modified land are limited to the likely invasion of disturbed soils by alien invasive plant species. If the vegetation is rehabilitated and pruned to acceptable Eskom standards, the CBA and ESA functions along the route can be maintained.

The greatest threat to the rehabilitation of the land disturbed by construction is the risk of invasive plant species that colonise the disturbed soil and spread into adjacent natural areas. Provided that no threatened species are removed or damaged without a permit, if remedial measures and monitoring are properly employed, the vegetation that will be disturbed during construction could rehabilitate well over time, and long-term impacts on vegetation could thus be minimal.

**The specialist is of the opinion that the impact of the proposed linear infrastructure will be temporary, and that vegetation can be rehabilitated within 2 to 3 years post construction**, provided that mitigation measures such as limited clearing and damage is implemented throughout the construction period.

**Terrestrial Biodiversity (Fauna)**

The bulk of the SEZ is bushveld of varying degrees of substrate rockiness and disturbance. Density of shrubs also varied, but for the large part could be considered medium to dense, the latter due to bush encroacher species for the most part. The Mogwase River on the western boundary of the site and the Elands River south of the SEZ and intersecting the servitude are the principal rivers in the area and identified as the main ecological corridors on site. More significant rocky habitat with large boulders and rock outcrops were associated with the riverine areas, specifically Mogwase River and the Seshabele River (Mogwase receiving River). The Elands River supported dense riverine woodland along its corridor. Other, more disturbed / modified habitats intersected included agricultural areas, grassy areas of old agricultural lands, open bushveld of the existing servitudes (dominated the servitude areas) and existing human development including the Bodirelo industrial township targeted for expansion.

Only 3 of the listed SCC are deemed likely in the SEZ area, and one other not originally listed as a trigger SCC is considered confirmed for the Vaalkop Dam area. These four species formed the focus of the fauna species assessment along with eight additional TOP species that could not be conclusively excluded from the SEZ. Animal activity and signs of animal activity was however not as abundant as expected for the area considering its proximity to a protected area and it is likely that anthropogenic activity in the area has driven many animals to less disturbed habitats of the PA and possibly the expansive bushveld further west of the PA and eastwards of the SEZ.

From the overall SEI assessment and the proposed development the following is relevant:

- The riverine areas associated with the Mogwase River and its associated terrestrial rocky banks scored high SEI and should be excluded from the development zone. Most of this area has already been excluded.
- The bulk of the site was classified as medium SEI and requires minimisation. As stipulated in Section 5.3, this was an over-estimated rank for the overly-utilised bushveld on site. Due to existing development in the area, any additional development is likely to cause fragmentation and further disturb the habitat. In terms of

terrestrial fauna, it is recommended that the following be considered in the final development plan to achieve minimisation:

- Add an additional 100m NO-GO buffer (minimum buffer for crocodiles as per guidelines) to the Mogwase River where it borders the site in the central and southern locations (northern section is already highly disturbed and / or developed). This NO-GO buffer will be extended from the edge of the high SEI boundary OR the wetland boundary if this is greater than the high SEI area (aim to achieve the greater cumulative buffer area).
- It is also recommended that the development within 100m of the drainage lines on site and within 100m of the NO-GO buffer be of lower density development (<60% hardscaped), which will aid in maintaining open space and some associated ecological services and reduce edge effects on the buffers.
- Other open spaces (parks, pedestrian pathways, lunch areas, green stormwater drainage areas) should be considered into the final development plan as a whole and interconnected as far as possible
- The Bojanala EMF must be considered and applied in the final development plan in addition to the above.
- The Pilanesberg Provincial Nature Reserves' EMP must be adhered to regarding activities in its buffer zone.
- The managing body of the Pilanesberg Provincial Nature Reserve and Vaalkop Dam Nature Reserve must be consulted and any recommendations regarding activities within the PA buffer zones adhered to.

**Avifauna Assessment:**

This avifaunal specialist EIA assessment **failed to identify any significant impediment to the development** of the Bojanala Special Economic Development zone and its associated bulk infrastructure, including the proposed 132kV power line linking the zone to the Ngwedi Substation and the upgrading of the water pipeline linking the zone to the Vaalkop Water Treatment Works. There thus appears no reason on avifaunal grounds to deny authorization to the development in all its components. In addition, several mitigation measures are suggested for certain project components.

**Heritage Assessment:**

- Settlement and exploitation of the region started during the Early Stone Age and carried on throughout the Middle Stone Age into the Later Stone Age. This occupation is usually indicated by the presence of stone tools occurring in the vicinity of hills and outcrops as well as on the banks of rivers.
    - It is known that stone tools dating to the MSA are found in the vicinity of the various streams crossing the area, as well as on outcrops and low hills.
- It is anticipated that the impact of the development of this type of site would be negligible as typically development would not take place on stony outcrops or hills.
- Settlement sites dating to the Early Iron Age, are often found in open areas close to rivers where the rich alluvial soils were exploited for cultivation of crops. Later, during the Late Iron Age, sites tend to cluster at the foothills of the various mountains and hills in the larger region. This was mostly the result of the influx of large groups of people which led to uncertainty and stress. People therefore tended to build their settlements in more protected areas, on or near hills and mountains
    - At present, a small number of such sites are known to be located in the vicinity of the southwestern section of the power line. Fortunately, the known sites are located sufficiently far away from the proposed power line route, which it would not be impacted on.
- Heritage sites dating to historic times are found in the larger region, as well as in the project area.
    - A number of historic features are known to exist in the project area. These, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years.

- Cemeteries known to exist in the larger region, with only one known to be located inside the project area.
    - It is possible that smaller, isolated burial sites might also occur sporadically in the project aera. The grave of young boy that died in 1932. There might be a second grave only marked with stones.
- The remains of linear developments, such as roads, railways, railway stations, power lines and telephone lines that would pass through the area. This would include railway stations, bridges and culverts.
    - An abandoned railway line, constructed during the late 1970s with the development of Bodirelo Industries, crosses through the area. However, it has been abandoned and the tracks have been removed. All that remains are sections of the embankments and one river crossing. Due to its recent age, it is viewed to have low significance.

*From the above review it is therefore possible to say with a very high degree of certainty that based on the available information, the type of environment in which the development is to take place and the site survey, this is an area with a low potential for the presence of heritage sites and resources. From a heritage point of view, it is recommended that the Proposed Project be allowed to continue on acceptance of the mitigation measures presented in the report (see **Appendix E5**).*

**Palaeontological Assessment:**

It is in compliance with The Minimum Standards for Palaeontological Components of Heritage Impact Assessment Reports, SAHRA APMHOB, and Guidelines 2012. The development is underlain by the rocks of mostly the Bushveld Complex, Vaalian in age, with a VERY LOW Palaeontological Sensitivity (Groenewald and Groenewald 2014*). This development will take place on igneous rocks; therefore, the impact will be VERY LOW.

**Visual Assessment**

The significance of the visual impact is determined through separate assessments of impacts on the landscape character and impacts on observers in the study area. This has been done for the construction and operational phases as each phase presents different impacts. The landscape character and the observers are receptors in the study area and have different sensitivities. It is expected that each receptor will respond differently to the anticipated visual impacts.

The sources of visual impacts will originate from the construction activities associated with the pipeline, SEZ and powerline. The presence of a workforce and machinery operating during the construction process will cause visual intrusion and alter the character of the landscape in various degrees. When the projects are complete, the newly constructed SEZ and powerline will be sources of impacts as their presence will result in a visual change that is different to the existing baseline environment. During both phases, inherent mitigating factors for example screening by the topography/vegetation and observer's distance from the sources of impact, increases the VAC and limits the ZVI. The inherent mitigation factors are not enough to completely eliminate the potential impacts, and additional mitigation measures should be considered.
Observers in the study area will be affected differently by the potential impacts, due to their distance away from the source of impact and their sensitivity towards their visual environment. Residents and tourists residing or entering the ZMVE are considered the most sensitive observers in the study area. These were identified as residents from Mogwase and tourists to The Kingdom Resort and Predator World.

**The landscape character will experience transformations as a result of the implementation of the project**. The most significant will be construction and operation of the SEZ that will develop an area of 1117ha. The completed SEZ will fill in and expand unto the open spaces that currently contribute to a rural and sparsely

developed residential and industrial character. The SEZ will expand on the existing industrial theme, thereby increasing the dominance of industrial infrastructure. A loss of open space will occur, and it is expected that the landscape character will be altered to a much larger developed area.

The completed powerline will add another powerline to the visual environment and increase the visual dominance of the powerline corridor. Although it is considered compatible with the existing land use of linear power infrastructure, it will remain in contrast with the natural-farmland landscape character as it will exceed the height of the natural vegetation and interfere with views to other valued visual resources such as the Pilanesberg Mountains. This is particularly true for motorists travelling on the R556 and tourists visiting the Predator World and The Kingdom Resort. The visual clutter of powerlines will increase which will detract from the scenic quality of the environment.

Impacts should be mitigated, especially those associated with the SEZ and powerline. Avoidance, reduction and remediation mitigation measures have been recommended of which the most effective will be to:

- Establish a philosophy that the SEZ should be shrouded in vegetation and that more vegetation is visible than building facades, roofs, parking areas etc. Plant street trees and perimeter planting as soon as possible and appoint a horticulturist to guide on species. This will increase the screening capacity of the site from outside views;
- Develop an aesthetic standard for buildings in order to maintain visual coherence and harmony;
- Restrict building height to 2 storeys;
- Consider an underground power cable. This will cause the least visual impact and landscape impacts; and
- Consider consolidating multiple powerlines in one to avoid parallel running powerlines.

**No fatally flawed issues are identified**.

**Social-Economic Impact Assessment**

The greatest positive impact that the SEZ will deliver is the creation of full-time permanent employment during the operations phase. The SEZ will aim to attract high technology companies and skilled individuals nationally and even internationally.

It is the opinion of the social specialist that, from a social impact perspective, **the project will deliver much needed employment and high value economic development in the Bojanala Platinum region and the North West province**. These positive impacts, however, must not be undone by the negative impacts before and during construction, operations and decommissioning of the development. Conditions are therefore recommended for inclusion in the environmental authorisation, to reduce risks for the community and the SEZ development

**Air Quality Assessment**

The dispersion modelling results indicate high incremental ambient concentrations for most of the pollutants assessed in this AQIA, particularly under the expansion scenario. However, predicted concentrations still fall below the applicable limits over most areas surrounding the existing and proposed landfill sites and WWTPs. Where exceedances of the applicable limits are observed beyond the proposed SEZ boundary, these occur within maximum radii of 11km and 8km under the actual and expansion scenarios, respectively. Ammonia, chloroform, dimethyl sulphide, hydrogen sulphide, ethyl mercaptan and methyl mercaptan are among the list of pollutants for which high concentrations were predicted in nearby surrounding areas, particularly west and south of the proposed SEZ boundary. These six compounds have particularly strong odours which are recognisable

even at very low ambient concentrations. People residing close to the proposed Mogwase SEZ may recognise these odours and find them objectionable under certain meteorological conditions. In terms of odour impacts, **the odour emissions at the existing and proposed landfills and WWTPs should be relatively low if the facility is well** managed, and the recommendations provided in this report are effectively implemented as far as practically possible. The overall impact is identified to result in low to medium negative impacts, with no fatal flaws identified under both the actual and expansion operating scenarios.

## 10.2 A summary of the positive and negative impacts and risks of the proposed project

A summary of the impact assessments is presented in **Table 19**; the tables cover the construction and operational impacts. An overall weighted score is provided in each case. Thus far each of the environmental issues are assigned equal weighting (I.e. the weighted score is the average of each of the individual scores. The impact scores are also colour coded according to the following:

| | |
|---|---|
| **< 30** | **Low significance** |
| **30 to 60** | **Moderate significance** |
| **>60** | **High significance** |

It must be noted that the impact scores in **Table 19** below are not intended to be definitive measures of environmental impact, but they are a useful guide to evaluating the overall environmental performance of a new development and they assist in interpreting key influences of a development

**Table 19:** Impact Summary table

| **CONSTRUCTION PHASE** | | |
|---|---|---|
| **Environmental Aspect** | **Without Mitigation** | **With Mitigation** |
| **Aquatic and Wetland Impact Assessment** | | |
| Changes in water flow regime | Medium | Low |
| Changes in sediment regime | Medium | Low |
| Introduction and spread of alien vegetation | Medium | Low |
| Loss and disturbance of watercourse/pan habitat and fringe vegetation. | Medium | Low |
| Changes in water quality | Medium | Low |
| Loss of aquatic biota | Medium | Low |
| **Terrestrial Vegetation** | | |
| Destruction of natural vegetation on the development | Medium | Medium |
| Destruction of natural vegetation: Linear infrastructure | Medium | Medium |
| Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses | Medium | Low |
| Removal / Destruction of protected plants and plants of conservation concern | Medium | Low |
| Potential increase in alien and invasive vegetation | High | Low |
| Bush densification | Medium | Low |
| Linear infrastructure: Clearing of land for construction camps and potential pollution of the soil and water | Medium | Low |
| Compaction and destruction of soils | Medium | Low |

| | | |
|---|---|---|
| **Terrestrial Fauna** | | |
| Loss and alteration of faunal habitat | Low | Low |
| Severing or impairing ecological corridors and loss of habitat connectivity | Medium | Low |
| Attraction of pests and exotic / alien species | Medium | Low |
| General destruction of fauna, including the ecologically significant species. | Medium | Low |
| Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste | Medium | Low |
| **Avifauna** | | |
| Destruction of wetland and waterbird habitat by upgrading WWTP | Low | Low |
| Collision threat to flying waterbirds from power line linking the Manyane Substation to the proposed new northern substation | Medium | Low |
| Collision threat to flying waterbirds from power line linking the SEZ zone to Ngwedi Substation. | Medium | Low |
| Potential threat of disturbance to communal waterbird breeding colony ('heronry') at Vaalkop Water Treatment Works by construction phase of waterpipe upgrade | Low | Low |
| Disturbance and habitat modification by routing the proposed water pipeline upgrade through an area without an existing pipeline corridor rather than through an existing corridor | Medium | Low |
| **Heritage & Paleo Impact** | | |
| Loss or damage to burial sites within the project boundaries | Medium | Low |
| Loss or damage to sites, features or objects of cultural heritage significance | Low | Low |
| Destruction, Damage & Loss of fossil material | negligent | |
| **Visual Impacts** | | |
| Severity of impacts on observers (OB) and landscape character (LC) | Medium | Low |
| Severity of SEZ impacts on observers (OB) and landscape character (LC) | Medium OB | Medium |
| | High LC | Medium |
| Severity of Powerline impacts on observers (OB) and landscape character (LC) | Medium | Low |
| **Social Impacts** | | |
| Increasing Regional Employment (positive) | Low | Medium |
| Progressing Regional Economic Growth(positive) | Low | Medium |
| Decreased quality of Life | High | Low |
| Social and Economic Displacement | Medium | Low |
| **General impacts** | | |
| Traffic Impacts | Medium | Low |
| Noise Impacts | Medium | Low |
| Impact on other existing services | Medium | Low |
| **OPERATIONAL PHASE** | | |
| **Environmental Aspect** | **Without Mitigation** | **With Mitigation** |
| **Aquatic and Wetland Impact Assessment** | | |
| Changes in water flow regime | Medium | Low |
| Changes in sediment regime | Medium | Low |

| | | | |
|---|---|---|---|
| | Introduction and spread of alien vegetation | Medium | Low |
| | Loss and disturbance of watercourse/pan habitat and fringe vegetation. | Medium | Low |
| | Changes in water quality | Medium | Medium |
| | Loss of aquatic biota | Medium | Low |
| **Terrestrial Vegetation** | | | |
| | Destruction of natural vegetation on the development | Medium | Low |
| | Destruction of natural vegetation: Linear infrastructure | Medium | Low |
| | Exposure to erosion and subsequent sedimentation or pollution of proximate watercourses | Medium | Low |
| | Removal / Destruction of protected plants and plants of conservation concern | Medium | Low |
| | Potential increase in alien and invasive vegetation | Medium | Low |
| | Bush densification | Medium | Low |
| | Linear infrastructure: Clearing of land for construction camps and potential pollution of the soil and water | Medium | Low |
| | Compaction and destruction of soils | Low | Low |
| **Terrestrial Fauna** | | | |
| | Loss and alteration of faunal habitat | Low | Low |
| | Severing or impairing ecological corridors and loss of habitat connectivity | no further impact expected | |
| | Attraction of pests and exotic / alien species | Medium | Low |
| | General destruction of fauna, including the ecologically significant species. | no further impact expected | |
| | Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste | Medium | Low |
| **Avifauna** | | | |
| | Destruction of wetland and waterbird habitat by upgrading WWTP | Medium | Low |
| | Collision threat to flying waterbirds from power line linking the Manyane Substation to the proposed new northern substation | Medium | Low |
| | Collision threat to flying waterbirds from power line linking the SEZ zone to Ngwedi Substation. | Medium | Low |
| | Potential threat of disturbance to communal waterbird breeding colony ('heronry') at Vaalkop Water Treatment Works by construction phase of waterpipe upgrade | Low | Low |
| | Disturbance and habitat modification by routing the proposed water pipeline upgrade through an area without an existing pipeline corridor rather than through an existing corridor | Medium | Low |
| **Heritage & Paleo Impact** | | | |
| | Loss or damage to burial sites within the project boundaries | Low | Low |
| | Loss or damage to sites, features or objects of cultural heritage significance | Negligible | Negligible |
| **Visual Impacts** | | | |
| | Severity of impacts on observers (OB) and landscape character (LC) | High | Very Low |
| | Severity of SEZ impacts on observers (OB) and landscape character (LC) | High | Medium |
| | Severity of Powerline impacts on observers (OB) and landscape character (LC) | Medium | Medium |

| | | |
|---|---|---|
| **Social Impacts** | | |
| Increasing Regional Employment (positive) | Medium | Medium |
| Progressing Regional Economic Growth (positive) | Medium | Medium |
| Decreased quality of Life | High | Low |
| **Air Quality & Odour** | | |
| Dust fall, odours and HAPs emissions from construction activities associated with the proposed expansion of the WWTP | Medium | Low |
| **General impacts** | | |
| Traffic Impacts | Low | Low |
| Noise Impacts | Medium | Low |
| Risks of Fires & Explosions | Medium | Low |
| Storm water Management | Medium | Low |

**Table 19** gives a summary of the impact significance established through the basic assessment investigation, from this summary it is apparent that the significance levels of the majority of identified impacts are of Medium-Low significance for all alternatives investigated and this can further be reduced to acceptable low significance levels thus, the proposed developments could proceed provided that the mitigation measures set out in this report and in the EMPr and the Rehabilitation Plan (Appendix E) are diligently implemented to limit the potential impacts on vegetation, watercourses and social during construction and operation of the developments. Apart from the anticipated Construction phase impacts, which would be temporary (short-term duration), other impacts identified (including cumulative impacts) are associated with ecological aspects, waste and potential, but slight, increase in traffic volumes. Where impacts are unavoidable, they have been found to be of moderate to low significance according to the criteria used and furthermore, can be mitigated through appropriate design and effective implementation of the EMPr.

The HIGH negative impacts that were identified were with the visual due to changes in the general landscape character, the completed SEZ will fill in and expand unto the open spaces that currently contribute to a rural and sparsely developed residential and industrial character. The SEZ will expand on the existing industrial theme, thereby increasing the dominance of industrial infrastructure from ± 127ha to 1117ha. A loss of open space will occur and it is expected that the landscape character will be altered to a much larger developed area. However even these impacts can all be reduced through the recommended mitigation measures to MODERATE post-mitigation impacts.

**Overall, the benefits of the project are expected to occur at a national, regional and local level. These benefits partially offset the majority of the localised environmental costs of the project**

## 10.3 Site specific Environmental sensitivities/ attributes

The entire site has been assessed by various specialists, and this information has been analysed spatially and then used to inform the most environmentally acceptable layout for the proposed SEZ.

### 10.3.1 SEZ Site Environment sensitivities

The following highly sensitive areas/environmental features (**Figures 67)** have been identified on the **SEZ site**:

- **Wetlands**: Several watercourses were identified in the proposed SEZ. These include a 4th order perennial river known as the Mogwase River and sever smaller Non-perennial streams of 1st and 2nd order that flows into the Mogwase River before it flows into the Elands River to the south. Additionally, another non-perennial episodic stream is found in the south-eastern section of the SEZ and drains directly into the Elands River. It should be noted that two of the non-perennial streams that flow into the Mogwase River have some elements similar to wetlands, that is sections with no channel and slow flow, as well as an absence of woody vegetation replaced with wetland vegetation. These areas are thought to have these wetland features due to anthropogenic changes in hydrology, geomorphology and vegetation of these units. The watercourses associated with the SEZ as well as the calculated buffer zones include, perennial River (Mogwase River) – 54 m; Non-Perennial with Wetland Features – 54 m; Non-Perennial Episodic Stream (South Western Section)– 23 m and Non-Perennial Episodic Streams (South Eastern Section) – 54 m
- **Fauna & Avifauna habitats** of high sensitivity are associated with the drainage line habitat which traverses the study area. Although this contributes a small portion of the area, they are ecologically significant and represent an important habitat for avifaunal activity and attract many species. It is important to maintain the connectivity of the drainage lines within the area and protect them from degradation. This area of high avifaunal sensitivity is excluded from the from the development footprint.
- The **areas of high ecological sensitivities:** The proposed development area does not fall within a listed ecosystem; however, the vegetation is largely in a natural state with some minor and limited major ecological impacts. Furthermore, the development footprint falls mostly within a CBA and some ESAs could be impacted on too. The drainage lines and ESA provide ecosystem services such as flood attenuation, nutrient cycling and connectivity. The Site Ecological Importance (SEI) results in a medium sensitivity for much as the site, while watercourses were rated higher. Suitable habitat is present on the site for two (2) Near threatened plant species, which contributes to the medium SEI ratings. Several provincially protected plants, as well as national protected tree species are present throughout the development footprint. Development activities of medium to high impact are acceptable within the medium and low sensitivity areas. Most types of development can proceed within low sensitivity with little to no impact on conservation worthy vegetation, bar protected tee species.
- **Heritage sites**: If it is decided to retain the burial site located within the site, it should be fenced off permanently by means of a wire fence or brick wall, with a buffer zone of at least 20m. A heritage sites dating to historic times are found near the north west site of the project area, this may be impacted by the proposed 132 kV Line to the Manyane Substation. These Site, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years.
- **Visual sensitive receptors**: The construction phase will introduce new elements to the visual environment (i.e. construction equipment) that are otherwise uncharacteristic within the context of the landscape. The existing vegetation cover on the property will be damaged/removed and replaced by unsightly bare earth while construction continues. A noticeable change in the qualities of the landscape will occur which will translate into negative impacts on the scenic qualities.

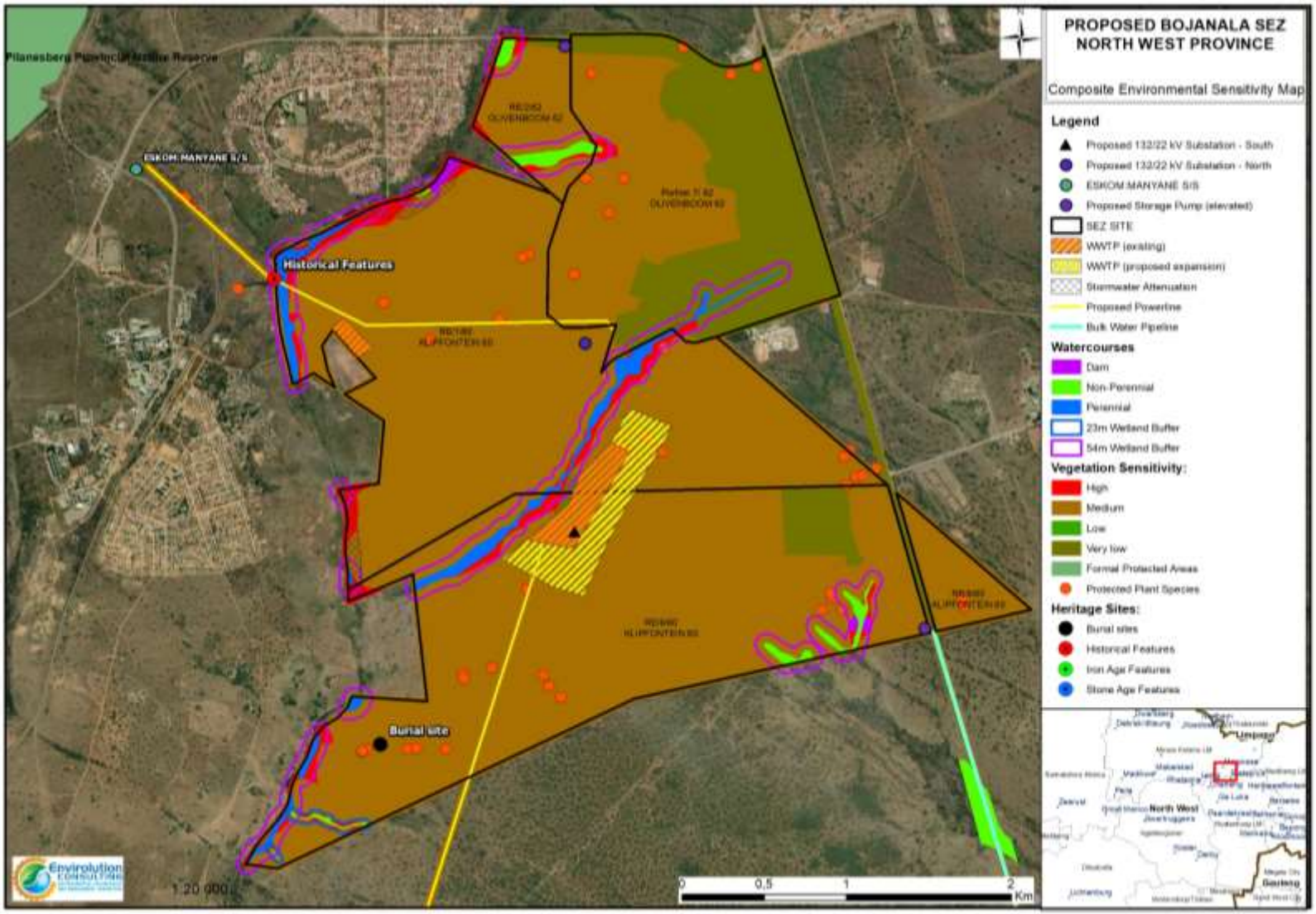



**Figure 67:** Composite Environmental Sensitivity Map for the proposed Bojanala SEZ showing areas of high sensitivity (A3 map included in **Appendix A3**).

10.3.2 Environmental sensitivities along the **proposed 132kV Powerline** (From SEZ to Ngewdi Substation)

The following highly sensitive areas/environmental features along the proposed 132kV Powerline (**Figures 68**: please **refer to Appendix A3 for the zoomed insets)**

- **Wetlands**: The proposed powerline crosses a total 16 watercourses. These include many minor rivers and streams such as Ga-Mamosadie-, Molapomotsho-, Mankwe- and Seshabele Rivers as well as the larger Elands River. The rivers and streams range from Non-Perennial Episodic, Non-Perennial Ephemeral to Perennial Rivers. All of the watercourses that cross the powerline are associated with the Elands River and ultimately drain into the Elands River. Although a large section of the powerline is within current road reserves (thereby decreasing potential risks and impacts) most of the extent is located on open land and thus prone to some impacts that should be mitigated.
- **Fauna & Avifauna habitats** of high sensitivity are associated with the drainage line habitat which traverses the study area. Although this contributes a small portion of the area, they are ecologically significant and represent an important habitat for avifaunal activity and attract many species.
- The **areas of high ecological sensitivities:** The Site Ecological Importance (SEI) results in a medium sensitivity for much as the site, while watercourses were rated higher. Site Ecological Sensitivity for the proposed powerline, including recorded localities of protected plant species in sampled areas
- **Heritage sites**: At present, a small number of such sites are known to be located in the vicinity of the southwestern section of the power line. Settlement sites dating to the Early Iron Age, Fortunately, the known sites are located sufficiently far away from the proposed power line route, that it would not be impacted on. These Sites, irrespective of their state of conservation, enjoy general protection under the Heritage Act as they might be older than 60 years.
- **Visual Sensitive Receptors**: The completed project will add another powerline to a landscape that is already dominated by linear power infrastructure. It will detract from the value of the natural features such as the vegetation and views towards the mountainous backdrop, thereby affecting the scenic quality of the landscape.

10.3.3 Environmental sensitivities along Bulk Supply waterline

The following highly sensitive areas/environmental features (**Figures 69:** please refer to **Appendix A3 for the zoomed insets)** have been identified on the route of upgrading of existing 28km of 200mm Diameter Bulk Supply waterline from Vaalkop Water Treatment Works to Bodirello Industrial Area

- **Wetlands**: The pipeline follows an existing dirt road for most of the length. The existing pipeline crosses a total of 14 watercourses. The watercourses are predominantly smaller watercourses, mainly Non-Perennial Ephemeral and Episodic streams. The watercourses all drain in a southern direction into the Elands River or Vaalkop Dam directly. Because the pipeline is existing, the buffer zones for all the watercourses were calculated at 15m, because work will occur within the watercourses. It should be noted that the final section of the pipeline is located within the Vaalkop Nature Reserve. Although many remedial structures were recorded near the pipeline structures, many areas were eroded and would require additional rehabilitation measures. Furthermore, the dirt road adjacent to the pipeline has also created large erosional features at the water crossings and should ideally be remediated.

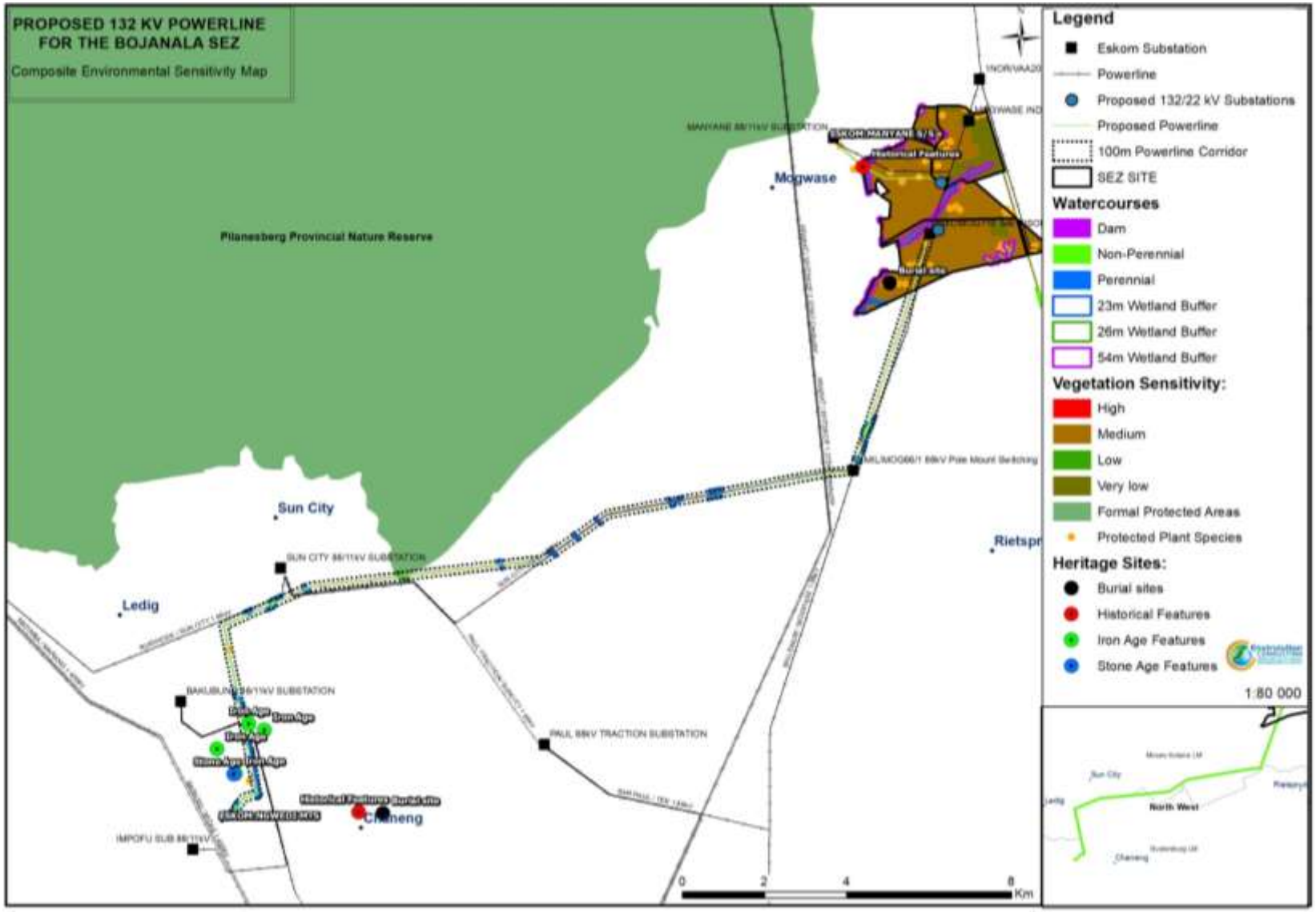



**Figure 68:** Composite Environmental Sensitivity Map for the proposed **132kV Powerline** (refer to Appendix A3 for the zoomed insets**)**

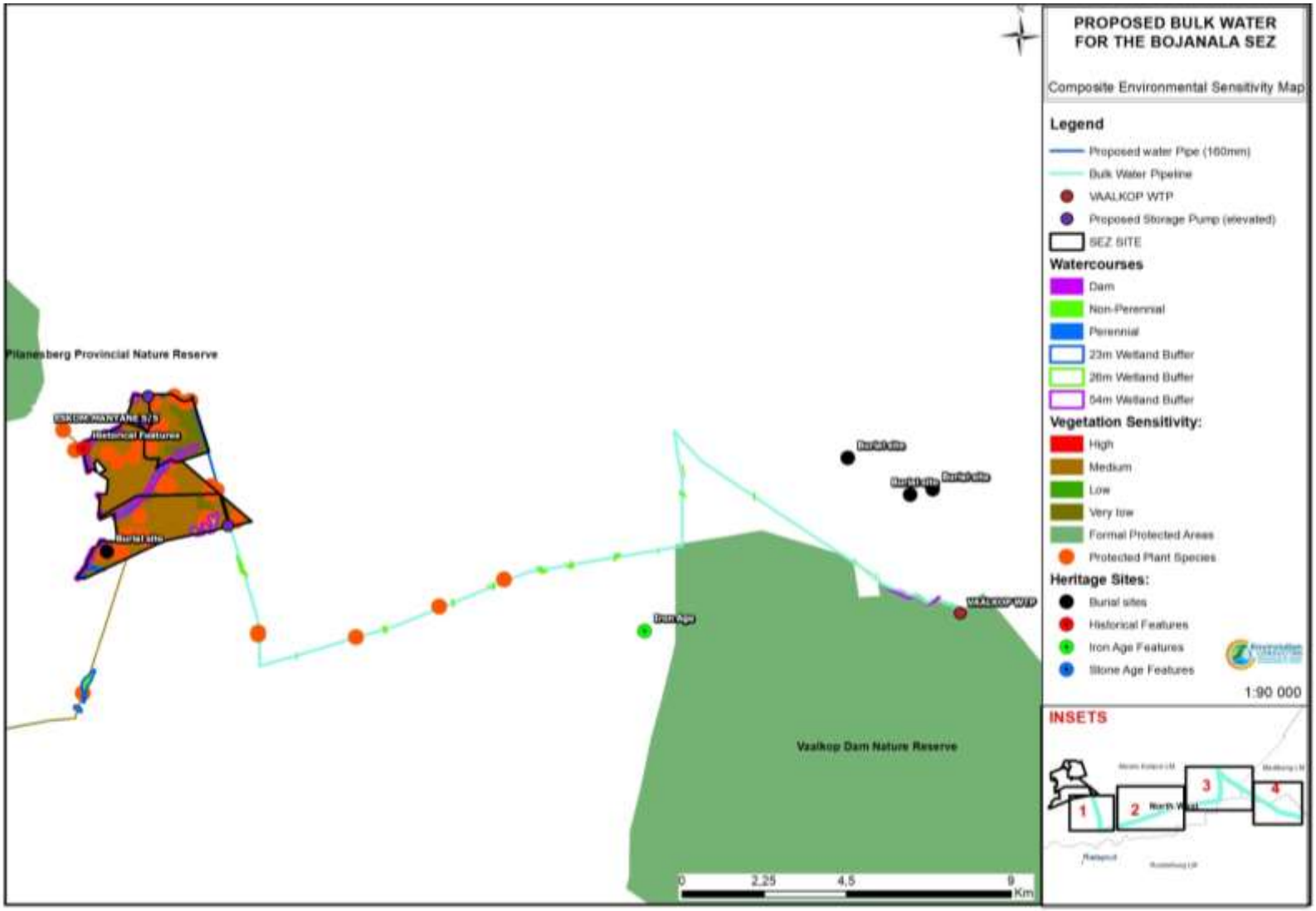



**Figure 69:** Composite Environmental Sensitivity Map for the proposed **Bulk Waterline** (refer to A**ppendix A3 for the zoomed insets)**

- **Fauna & Avifauna habitats** of high sensitivity are associated with the drainage line habitat which traverses the study area. Although this contributes a small portion of the area, they are ecologically significant and represent an important habitat for avifaunal activity and attract many species.
- The **areas of high ecological sensitivities:** The Site Ecological Importance (SEI) results in a medium sensitivity for much as the site, while watercourses were rated higher. Site Ecological Sensitivity for the proposed powerline, including recorded localities of protected plant species in sampled areas

## 10.4 Consideration of Alternatives

Chapter 4 provides a detailed comparison of alternatives for the proposed SEZ. It should be noted that the assessment of alternatives does not consider those alternatives that are not deemed to be either reasonable or feasible.

10.4.1 Technically considerations

**Location alternatives:**

- **No other site alternatives are proposed for the SEZ** as criteria used for selecting a suitable location for the SEZ are based on those characteristics required for the development of an industrial node. Provincial Government commitment to improve and install infrastructure; the site is suitable for development as it is flat with very little topographical constraints and the site is located in an area that needs development. The land is available for development; Part of the land is already zoned for industrial purposes. The site enjoys good access from the main access roads R510 and R556 and most infrastructures is available.

**Layout alternatives:**

- **Pipe Material Alternatives** (Bulk Water Supply Line): It is clear from the above that the uPVC-type material is the more suitable material for the Bulk Water Line given the non-dolomitic and non-corrosive soil conditions. Also, the existing Bulk Water Supply line is uPVC. **Therefore Alternative 2 (uPVC-type) of Pipe Material is preferred.**
- **Electrical Powerline Alternatives**: Overhead lines make up a large part of the interconnected system. They ensure low-loss transmission at 380-kV extra-high voltage, and thus guarantee reliable energy supply. Cables, in contrast, are predominately used in medium- and low-voltage networks, as well as for power distribution in densely built-up areas with high electricity demand. Nevertheless, underground cables have, in many cases, economic, ecological and legal disadvantages which must be carefully taken into consideration. The 132 kV overhead lines would be the most feasible option from an environmental and financial perspective. **Therefore Alternative 2 (overhead) of Powerline is preferred.**

**Technology alternatives:**

- **Stream Crossings Alternatives** (Bulk Water Supply Line): Taking into consideration the expected damage to the riverbed and surrounding environment as a result of open trench-excavation, it is recommended that ALL pipeline stream crossings be installed via Trenchless Technology. **Therefore Alternative 2 (Trenchless) of Stream/Water Crossings is preferred.**
- **Waste Water Treatment Alternatives** It is recommended that the existing pond sewer treatment system be used for further expansion and upgrading of the treatment capacity. **Therefore Alternative 1 (Existing Pond System) of the Waste Water Treatment is preferred.**

### 10.4.2 Environmental considerations

**Table 20** gives an overall summary of the preferred alternatives for each component of the development as a result of the comparative assessment in section 9.2

**Table 20:** Comparative Assessment Summary

| Aspect | Pipe Material Alternatives (Bulk Water Supply Line): | | Electrical Powerline Alternatives | | Stream Crossings Alternatives (Bulk Water Supply Line): e | | Waste Water Treatment Alternatives | |
|---|---|---|---|---|---|---|---|---|
| | **Alternative 1**: HDPE-Type Material | **Alternative 2**: uPVC | **Alternative 1:** Underground | **Alternative 2:** Overhead | **Alternative 1:** Open Trench Excavation | **Alternative 2:** Trenchless technology | **Alternative 1:** Existing Pond System | **Alternative 2**: Conventional Mechanical Activated Sludge Treatment Plants |
| **Aquatic** | Any | Any | Any | Any | Any | preferred | **preferred** | Any |
| **Vegetation** | Any | Any | 2nd preference | 1stpreference | Any | Any | Any | Any |
| **Fauna** | Any | Any | 2nd preference | 1stpreference | Any | Any | Any | Any |
| **Avifauna** | Any | Any | 1st preference | 2ndpreference | Any | Any | Any | Any |
| **Heritage** | Any | Any | Any | Any | Any | Any | Any | Any |
| **Palaeontology** | Any | Any | Any | Any | Any | Any | Any | Any |
| **Visual** | Any | Any | 1st preference | 2ndpreference | Any | Any | Any | Any |
| **Social** | | | | | | | | |
| **Technical considerations** | Not preferred | preferred | Not preferred | preferred | Not preferred | preferred | preferred | Not preferred |

From Table 20, it can be seen that **Technically, Alternative 2 is preferred** for Bulk Water Supply Line Pipe Material, Electrical Powerline and the Stream Crossings and **Alternative 1 is preferred** for the Waste Water Treatment. **Environmentally**, they are no impacts of unacceptably high significance associated with either alternative assessed for this project, and all alternatives are acceptable with the exception of Avifauna and Visual having preference for underground electrical powerline vs the overhead. However as discussed in section 4.3.2, technically underground power line are not feasible in this environ, the identified avifaunal issues associated with overhead powerline can be overcome in the detailed design phase by the careful placement of tower structures and following specialist recommendations in section 10.4.3 with regards to re-routing the line.

Thus, after assessing all alternatives on EIA phase level Alternative 2 was recommended for i) the Bulk Water Supply Line Pipe Material, ii) Electrical Powerline; and iii) the Stream Crossings then Alternative 1 is recommended for the Waste Water Treatment.

### 10.4.3 Specialist recommendations

- **Proximity of power line to Sun City sewage works:** It was noted that the proposed power line will run close to (south of) and parallel to the Sun City sewage works (central point -25.360417, 27.1042903; as show in **Image 1**). This site likely attracts waterbirds and it would appear precautionary/prudent to also mark the stretch of line running parallel to the sewage works, i.e. the stretch of line between the following co-ords: -25.363297, 27.100619 and -25.360461, 27.107705, a distance of about 750 m.

- **Proposed Powerline re-routing**: It would appear preferable for the routing of the new power line to be located south of the road as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA - the current proposed routing actually impinges on the protected area boundaries at one point (**Image 2**). The blue line is the Pilanesberg Nature Reserve/IBA which will also be avoided by following the blue route.


**Image 1:** The location of the Sun City sewage works and the proposed power line (orange line) linking the SEZ zone and Ngwedi Substation showing the stretch of line, between the two red markers, that require marking with bird 'flappers'/spirals.


**Image 2:** Proposed routing of the power line in its western portion showing the positioning of the power line (orange line) north of the R556 road.

- **Re Routing of WaterLine route:** Part of the apparent proposed upgraded water pipeline route between the SEZ zone and the Vaalkop Water Treatment Works (narrow solid green line in **Image 3**) showing the section that apparently does not follow any existing pipeline route and hence represents a 'greenfields' development (broad dashed green line). The apparent existing pipeline route through this section is shown by the broad dashed blue line. It is recommended that the pipeline follow this existing route (dashed blue line in **Image 3**) through this section.


**Image 3**: Proposed re-route of the Bulk WaterLine near the Vaalkop Water Treatment Works

## 10.5 Conclusion (Opinion of the EAP)

The ecological impacts of all aspects for the proposed Bojanala SEZ and associated Bulk services were assessed and considered to be ecologically acceptable, provided that the mitigation measures provided in the report are implemented. All impacts are rated as MODERATE to HIGH pre-mitigation; therefore, implementation of recommended mitigation measures is an important element of the mitigation strategy. Implementing the recommended mitigations measures will reduce impacts to LOW.

None of the proposed alternatives are considered to be Fatally Flawed, for the most parts, impacts on the natural environment were the same for all alternatives. Thus, after assessing all alternatives on EIA phase level Alternative 2 was recommended for i) the Bulk Water Supply Line Pipe Material, ii) Electrical Powerline; and iii) the Stream Crossings then Alternative 1 is recommended for the Waste Water Treatment. The No-Go option refers to the proposed SEZ not being constructed. This option will therefore have no impact (positive or negative) on the local vegetation and biodiversity if it is not constructed. The local area is fairly developed with various industrial clusters, roads and medium density urban areas occurring.

In terms of cumulative impacts, the proposed line is in general proposed along routes where there are already power lines in place. Provided the new lines are constructed close to these lines such that the associated access roads can be shared, the cumulative impacts are likely to be low. Considering the findings of the specialist assessments undertaken for the project, cumulative impacts range from a low to moderate significance (on a

landscape level in this region of Mogwase). The use of the EMPr and mitigation measures would assist in mitigating these negative impacts to an acceptable level.

Although a number of significant impacts are associated with the proposed SEZ, it is the professional opinion of Envirolution Consulting and the specialists that:

- The vast majority of environmental impacts identified can be adequately mitigated to reduce the impacts to an acceptable level, provided mitigation measures recommended in this report are implemented and maintained throughout the life of the project.
- The implementation of mitigation measures and recommendations must be consistently monitored by an independent Environmental Control Officer (ECO) during construction.
- The recommendations made by all specialists and the EAP in the EMPr (Appendix F) must be implemented.
- The information in the report is sufficient to allow DFFE to make an informed decision.

It is the opinion of Envirolution Consulting that NO FATAL FLAWS are associated with the proposed Bojanala SEZ and associated Bulk services

## 10.6 Recommendations

It is the opinion of Envirolution Consulting that the proposed Bojanala SEZ and associated Bulk services should be approved provided that appropriate mitigation measures are implemented and that the Environmental Management Programme (EMPr) is implemented, maintained and adapted to incorporate relevant legislation, standard requirements and audit reporting, throughout the life of the proposed SEZ.

The mitigation measures for all impacts identified in the EIA are provided in the detailed impact assessment in **Appendix E** and have been incorporated into the EMPr (**Appendix F**). The EMPr must be implemented by the relevant parties during all phases of development of the project i.e. Planning & Design, Construction and Operation phase. Inclusions, additions and adaptations of the EMPr, as well as all final plan drawings and maps must be submitted to DFFE for final approval. The following conditions would be required to be included within an authorisation issued for the project:

Site-specific conditions to be noted include:

**Aquatic and Wetland:**

- Mark all areas which don't form part of the proposed development within the watercourse as no-go areas.
- The number of wetland and stream / river crossings must be minimised as far as practically possible. Unnecessary watercourses crossings (i.e. proposed crossings that can be re-aligned) must be re-aligned and avoided;
- No pylons or towers must be established within or within 50m of any wetlands or riparian areas; where wetland and stream / river crossings are required, every effort should be made to minimize the impacts by considering the following
- Where new service roads are aligned near wetlands and streams / rivers, a minimum buffer of 30m should be maintained between the wetland / riparian edge and the edge of the road as far as practically possible.

**Terrestrial Biodiversity**

- Removal of vegetation must be restricted to the proposed development footprints

- Plan to maintain naturally vegetated open spaces around drainage lines and through the development to ensure ecological corridor through the site.
- The route through the Pilanesberg National Park should be reconsidered and align as close as possible with the road reserve and fence line where historic disturbances took place.
- Trees underneath the powerline or along the works area for the pipeline must be pruned to acceptable heights, instead of clear-felling. This will limit degradation of the vegetation and the subsequent invasion by alien invasive plant species
- The specific individual industrial and commercial activities or projects that will be on the development site must assess their smaller footprint for plant species of conservation concern prior to commencement of planning activities. See Appendix C with regards to the two (2) species mostly likely to occur and their associated habitat preferences.
- Ensure that the environmental authorisation stipulates that provincial protected species can be removed / relocated or apply for a permit to do so.
- Survey the final footprints of pylons and pipelines for plant species of conservation concern. This must inform permit applications
- *Boophone distichia* and *Crinum* species must be relocated to outside of the development footprint if it will be impacted on.
- Provincially protected succulents should be relocated to open spaces outside of the development footprint with the permission of the local authority.
- Apply for permits for the destruction or pruning of national protected trees through the local Department of Forestry, Fisheries and the Environment (DFFE). Assessed areas that will be cleared for construction to determine the number of national protected tree species that will be affected. This will inform he permit application.

**Avifauna:**

- **Proximity of power line to Sun City sewage works:** It was noted that the proposed power line will run close to (south of) and parallel to the Sun City sewage works. This site likely attracts waterbirds and it would appear precautionary/prudent to also mark the stretch of line running parallel to the sewage works,
- **Proposed Powerline re-routing**: It would appear preferable for the routing of the new power line to be located south of the road as hopefully allowed by the 100 m corridor in this section to 'bundle' all the power lines through this section and to move the proposed power line further from the Pilanesberg Nature Reserve/IBA - the current proposed routing actually impinges on the protected area boundaries at one point. A further issue relevant to the power line is that close to its western end the proposed route is apparently north of the R556 road, whereas the other adjacent parallel existing power lines are situated south of this road.
- **Re Routing of Waterline route:** It is recommended that the pipeline follow this existing route

**Heritage:** Avoidance/Preserve is viewed to be the primary form of mitigation and the site should be retained in situ and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall) of 20m.

General conditions includes

- An independent **Environmental Control Officer (ECO)** should be appointed to monitor compliance with the specifications of the EMPr for the duration of the construction period.

- Upon approval of the project, an important component of the project would be to **fine-tune the 22m servitude** design (placement of the footprints) in terms of the receiving environment in the approved corridor of 100m wide. This would require a walk-down of the line and subsequent negotiations with all land owners to ascertain how the impacts on their properties can be mitigated, e.g through relocation of infrastructure, compensation or other acceptable measures. Construction will not be possible before agreements have been reached with all land owners along the entire route.
- Refinement of the preferred option should be done during design phase of the project, in particular once placement of the tower structures is planned. Avoidance of sensitive areas remains the best mitigation, followed by, minimisation, management and mitigation to maximum affect. Main features that need to be taken into consideration during detail design phase (and ultimately deciding where to place the tower structures) are to in as far as possible:
- Effective **stormwater management** should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost.
- **Sediment control** should be effective and not allow any release of sediment pollution downstream. This should be audited on a weekly basis to demonstrate compliance with upstream conditions.
- **Follow the alignment** of infrastructure such as roads and existing power lines
- **Avoid impacting on tourist facilities** such as guesthouse, holiday resorts and eco-tourism areas,
- Creation of **new access roads** should be minimised as far as possible.
- The **visual and intrusion** impacts are of concern, as well as the negative impact on the property value. In this regard, it is therefore recommended that the entire property for the substations be obtained by Eskom. Should this mitigation measure be implemented.
- Should any **archaeological artefacts** be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible. Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency. Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
- All relevant practical and reasonable mitigation measures detailed within this report and within the EMPr must be implemented. The implementation of this EMPr for all life cycle phases of the proposed project is considered key in achieving the appropriate environmental management standards as detailed in this report
- All declared **alien plants** must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983). The implementation of a monitoring programme in this regard is recommended.
- Care must be taken with the topsoil during and after construction on the site. If required, measures to reduce erosion to be employed until a healthy plant cover is again established.
- Rehabilitate construction sites by establishing with indigenous plant species, within the safety specifications for a power line. The 3m servitude for the underground cable servitude should be kept clear of plants to allow maintenance and repairs in future.
- Erosion control measures must be utilised during construction, operations, decommissioning and rehabilitation of the power lines, cables and substations.
- The developer should **obtain all necessary permits** prior to the commencement of construction.
- On-going monitoring of the development sites must be undertaken to detect and restrict the spread of alien plant species

## 10.7 Declaration by the EAP

**GESAN GOVENDER**

I, _____, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Signature of the environmental assessment practitioner

**ENVIROLUTION CONSULTING**

Name of company:

**01 February 2022**

Date

# 11 LIST OF APPENDICES

**Appendix A: Site plan(s)**

- Appendix A1: Locality Maps
- Appendix A2: Environmental Sensitivity Maps
- Appendix A3: Composite Environmental Sensitivity Map

**Appendix B: Conceptual Site Plans**

**Appendix C: Site Photographs**

**Appendix D: Public Participation Process**

- Appendix D1: Site Notices & Newspaper Advertisement
- Appendix D2: Written notifications
- Appendix D3: Authority Consultation
- Appendix D4: Comments on the Draft EIA Report
- Appendix D5: Minutes of meetings
- Appendix D6: Comment & Response Report
- Appendix D7: I&APs Database

**Appendix E: Specialist reports**

- Appendix E1: Aquatic Biodiversity Impact Assessment
- Appendix E2: Terrestrial Biodiversity (Vegetation) Assessment and Plant Species Assessment
- Appendix E3: Terrestrial Fauna Species Assessment
- Appendix E4: Avifauna Impact Assessment
- Appendix E5: Archaeological and Cultural Heritage Impact Assessment
- Appendix E6: Palaeontology Impact Assessment
- Appendix E7: Visual Impact Assessment
- Appendix E8: Socio-Economic Assessment
- Appendix E9: Air Quality Impact Assessment

**Appendix F: Environmental Management Programme (EMPr)**

**Appendix G: Additional Information**

- Appendix G1: Details of EAP (and expertise)
- Appendix G2: Screening Reports
- Appendix G3: Draft Technical Feasibility Study Report
- Appendix G4: Service Confirmation Letters
- Appendix G5: Hydrology Assessment
- Appendix G6: Geotech Assessment
- Appendix G7: Traffic Assessment