



Millennium  
Heritage  
Group (Pty) Ltd

Permit application Proposal

REPLACEMENT OF ELECTRICITY POLES AS PART OF MAINTENANCE OF THE  
BUNDLE CONDUCTOR AND TRANSFORMER STRUCTURES INSIDE MAPUNGUBWE  
NATIONAL PARK AND WORLD HERITAGE SITE  
LIMPOPO PROVINCE, SOUTH AFRICA



***Compiled for: De Beers, Venetia Mine  
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Millennium Heritage Group (PTY) LTD

## TECHNICAL SUMMARY

### I. TECHNICAL AND EXECUTIVE SUMMARIES

<b>Property details</b>	
Province	Limpopo
Magisterial District	Vhembe
Topo-cadastral map	22 29
Coordinates	Starting Point S22°.11. 38.08 "& E 29°.23.06.04"). End S22°.11.20.05 "& E 29°.23.45.05").
Closest town	Musina
Farm name	Greefswald

<b>Development criteria in terms of Section 38 (1) of the NHR Act 25 of 1999</b>	<b>Yes</b>	<b>No</b>
Construction of road, wall, <b>power line maintenance</b> , pipeline, canal or other linear form of development or barrier exceeding 300m in length	yes	
Construction of bridge or similar structure exceeding 50m in length		
Development exceeding 5000 sqm	yes	
Development involving three or more existing erven or subdivisions		No
Development involving three or more erven or divisions that have been consolidated within past five years		No
Rezoning of site exceeding 10 000 sqm		No
Any other development category, public open space, squares, parks, recreation grounds		No

<b>Development</b>	
Description of development	De Beers Venetia Diamond Mine seeks to perform maintenance work on the bundle conductor and transformer structures including replacement of damaged poles for a powerline over a distance of 1.25 kilometers along the Limpopo River.

Project name	<b>MAINTENANCE OF THE BUNDLE CONDUCTOR AND TRANSFORMER STRUCTURES ALONG THE LIMPOPO RIVER</b>
Developer	De Beers Venetia Mine
Heritage consultant	Prof Shadreck and Mr. Mathoho Ndivhuho Eric, Millennium Heritage Pty Ltd
Purpose of the study	To identify and assess significance of sites (if any) to be impacted by the proposed maintenance of the bundle conductor and transformer structures (including electrical pole) along the Limpopo River.

<b>Land use</b>	
Previous land use	Farmland, Military
Current land use	National Park, World Heritage site

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## 1. INTRODUCTION

This proposal seeks authorisation to replace damaged electricity poles that support a powerline which provides energy to water abstraction facilities owned by De Beers Venetia Mine inside the Mapungubwe National Park and World Heritage site. The proposed work will cover damaged poles within a powerline that is 1.25 kilometres long. Wood burrowing and natural degradation have weakened some of the poles to the extent that they cannot hold the load exerted by the powerlines. This poses a major risk to human and animal life, should the poles not be urgently repaired. The proposed work will involve digging new holes to accommodate new poles within a metre of the damaged poles.

The area proposed for work was previously disturbed and has pre-existing infrastructure such as water pipes. It is close to the Limpopo Riverbank where a fence used to mark the border between Zimbabwe and South Africa has been removed. De Beers holds a valid environmental authorisation and water use license for the wellfields that are powered by energy from the powerline. In 2018, a heritage impact assessment was performed in advance of the repair of well fields by De Beers (Chirikure 2018). The HIA together with a permit application were approved by SAHRA (Case ID:11803). The proposed work lies in the same area with the exception that holes will be excavated to accommodate new poles. A ground survey supported by desktop work was performed on the full 1.25 kilometres of the stretch (Chirikure and Mathoho 2019). The assessment found no heritage resources in the receiving environment. However, given the significance of the Mapungubwe Cultural Landscape and the provisions of the National Heritage Resources Act (Act 25 of 1999), all excavations must be authorised by the heritage authority. This is the purpose of this proposal: it seeks

authorisation to dig holes to place new poles to repair the powerline. Although the area is dominated by thick Limpopo alluvium deposits, the excavations will be monitored by the onsite team and project Manager who have been trained on the Mine's Heritage Resources Procedure aimed at the protection and conservation of any heritage resources. As specified in the Procedure, should any heritage resource be discovered during execution of the project, the activity will be stopped immediately, the area shall be barricaded, location marked by a GPS and a qualified archaeologist and the Parks Manager shall be notified. The archaeologist shall determine the appropriate process to be followed.

## **2. BACKGROUND**

The study area is situated in the north most part of the Limpopo Province near the Shashi Limpopo Confluence area, the meeting point for the boundaries of the three countries of Botswana, South Africa and Zimbabwe (Fouche 1937, Pikirayi 2001, Huffman 2007). The proposed work area is in the Mapungubwe National Park and World Heritage site, home to the National Heritage sites such as Mapungubwe Hill, K2, and Schroda. National Heritage sites have the highest level of significance in terms of the National Heritage Resources Act 25 of 1999. Additionally, Mapungubwe is a National park protected in terms of the NEMA Protected Areas Act of 2003. The boundaries of the national park form the core of the Mapungubwe Cultural Landscape World Heritage site listed on the world heritage list in 2003. Consequently, Mapungubwe is governed by the South African World Heritage Act of 1999. Flowing from the legislation, the Management Plan of the Mapungubwe National Park and World Heritage site (2013-2018) guides conservation and management processes at the site. Because heritage is a non-renewable resource, all these legal instruments are aimed at the sustainable protection of the cultural

significance of Mapungubwe and its surrounds. The sustainable protection of heritage confers many benefits to humanity. Indeed, inter-governmental bodies such as UNESCO and the African Union now strongly advocate for heritage led development within and around listed sites. This vision is also shared by the government of the Republic of South Africa which actively promotes the use of its World and National Heritage in unlocking developmental opportunities for its citizens. Not surprisingly, the Management Plan of the Mapungubwe National Park and World Heritage Site (2013-2018) actively seeks to promote heritage led development within and around the listed portion of the Mapungubwe Cultural Landscape (SANParks 2013).

The establishment of Mapungubwe National Park and World Heritage site involved the purchase of a series of farms to create a near 30 000 square kilometres large protected area. However, numerous facilities pre-existed on the former farms at that time of listing. Other pre-existing assets belong to De Beers Consolidated Mines' Venetia Mine which since 1992 abstracted water from along the Limpopo River. It must however be borne in mind that De Beers played an important role in the establishment of Mapungubwe National Park and World Heritage site through among other things sponsoring academic research and the donation of assets such as land. It was recognized at that time of listing that the conservation of Mapungubwe must accommodate historic infrastructure, on condition that such infrastructure was well maintained (Nomination Dossier 2002).

Against this background, De Beers Venetia Mine proposes to perform some maintenance work on its conductor and transformers including replacement of degraded poles (Fig 1). This is part of the existing powerline from the main pump house to the water abstraction sources

of the Venetia Wellfields (Boreholes) distributed alongside the Limpopo River. The project also involves replacement of damaged powerline poles and line realignment. This will make use of existing gravel access road and tracks used to maintain borderline fence and to drill new boreholes (Chirikure 2018). To ensure that the proposed development meets the environmental requirements in line with the National Environmental Management Act 107 of 1998 as amended in 2010 as well as the National Heritage Resources Act 25 of 1999 De Beers appointed an Independent Heritage Impact Assessment Consultants company Millennium Heritage Group (PTY) LTD to undertake an impact assessment of the proposed electrical poles maintenance project. The assessment found no heritage resources in the footprint of the proposed development.



**Figure 1:** Location of the proposed electrical maintenance project within the Mapungubwe National Park and World Heritage site (Adapted from Google Earth).

Generally, the project receiving area is overlain by between 15 and 20 meters of thick alluvium deposit. However, because Mapungubwe is a National Heritage site, any excavation of the



ground, even in disturbed areas, must be authorized by the South African Heritage Resources Agency in terms of the National Heritage Resources Act. Furthermore, the ICOMOS Guidelines of 2011 encourage management authorities to ensure that potential impacts are assessed before any proposed development are implemented within World Heritage Sites. This is further captured in the World Heritage Act of 1999 and the Mapungubwe National Park Management Plan. Based on these legislative requirements, a permit is required before the excavations for the replacement poles are initiated.

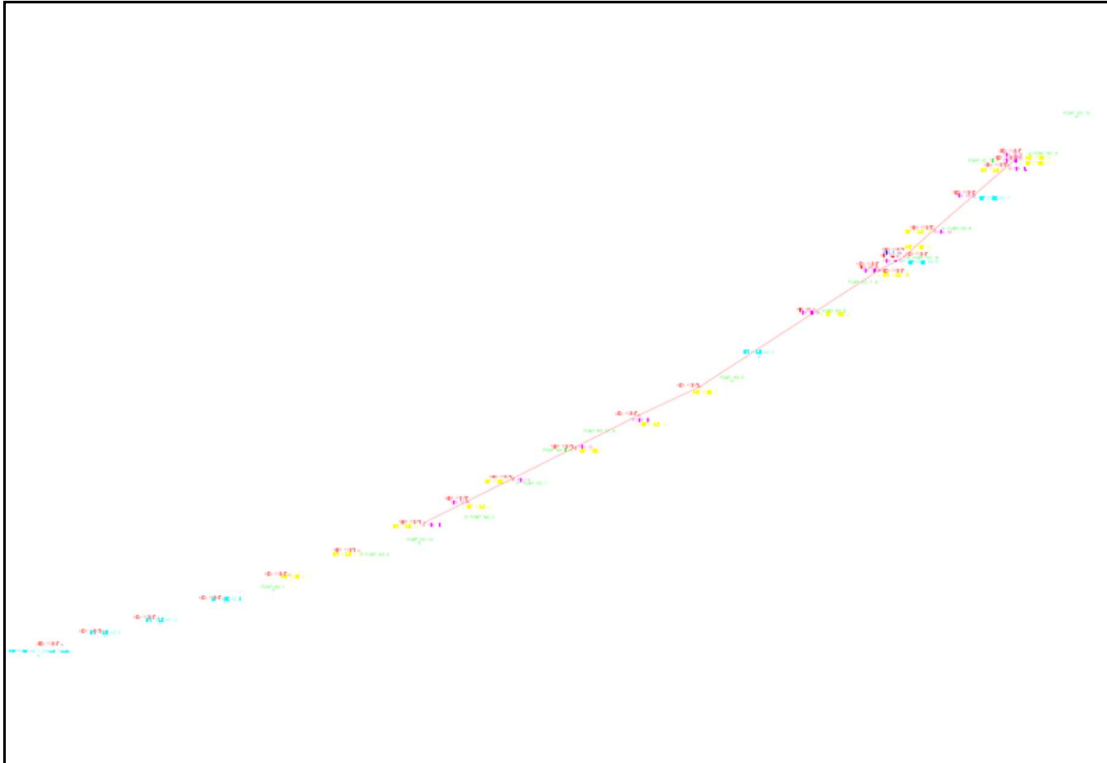
### 3. SCOPE OF WORK AND PROJECT DESCRIPTION

De Beers wishes to perform maintenance work on structures associated with the bundle conductor and transformer structures located within the Greefswald area of Mapungubwe National Park and World Heritage site. This work will also involve the placement of new poles to hold the powerline.



**Figure 2:** shows the problems associated with the existing poles which have introduced challenges associated with load strain from the powerline. This poses a strong risk to human and animal life and must be urgently addressed.

Figure 3 shows the proposed scope of the work, which involves placing new poles at short distances from the pre-existing ones. This will minimize ground disturbance while replacement poles will also be wooden to blend with the environment.



**Figure 3:** Plan drawing of the proposed work

## 4. LEGISLATION

### 4.1. The National Heritage Resource Act (25 of 1999)

This Act established the South African Heritage Resource Agency (SAHRA) as the prime custodian of the heritage resources and makes provision for the undertaking of heritage resources impact assessment for various categories of development as determined by section

38. It also provides for the grading of heritage resources (Section, 7) and the implementation of a three-tier level of responsibility and functions from heritage resources to be undertaken by the State, Provincial and Local authorities, depending on the grade of heritage resources (Section, 8)

In terms of the National Heritage Resource Act 25, (1999) the following is of relevance:

### **Historical remains**

**Section 34 (1)** No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant Provincial Heritage Resources Authority.

### **Archaeological remains**

**Section 35(3)** Any person who discovers archaeological and paleontological materials and meteorites during development or agricultural activity must immediately report the find to the responsible heritage resource authority or the nearest local authority or museum.

**Section 35(4)** No person may, without a permit issued by the responsible heritage resources authority-

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite;
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite;

- trade in, sell for private gain, export or attempt to export from republic any category of archaeological or paleontological material or object or any meteorite; or
- bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment which assist with the detection or recovery of metal or archaeological material or object or such equipment for the recovery of meteorites.

**Section 35(5)** When the responsible heritage resource authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or paleontological site is underway, and where no application for a permit has been submitted and no heritage resource management procedures in terms of section 38 has been followed, it may

- serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order
- carry out an investigation for obtaining information on whether an archaeological or paleontological site exists and whether mitigation is necessary;
- if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and
- recover the cost of such investigation from the owner or occupier of the land on which it is believed an archaeological or paleontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

**Subsection 35(6)** the responsible heritage resource authority may, after consultation with the owner of the land on which an archaeological or paleontological site or meteorite is situated; serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

### **Burial grounds and graves**

**Section 36 (3)** No person may, without a permit issued by SAHRA or a provincial heritage resources authority:

- (i) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (ii) bring onto or use at a burial ground or grave any excavation equipment, or any equipment which assists in detection or recovery of metals.

**Subsection 36 (6)** Subject to the provision of any person who during development or any other activity discover the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resource authority which must, in co-operation with the South African Police service and in accordance with regulation of the responsible heritage resource authority-

- (l) carry out an investigation for obtaining information on whether such grave is protected in terms of this act or is of significance to any community; and  
if such grave is protected or is of significance, assist any person who or community which is a direct descendant to decide for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangement as it deems fit.

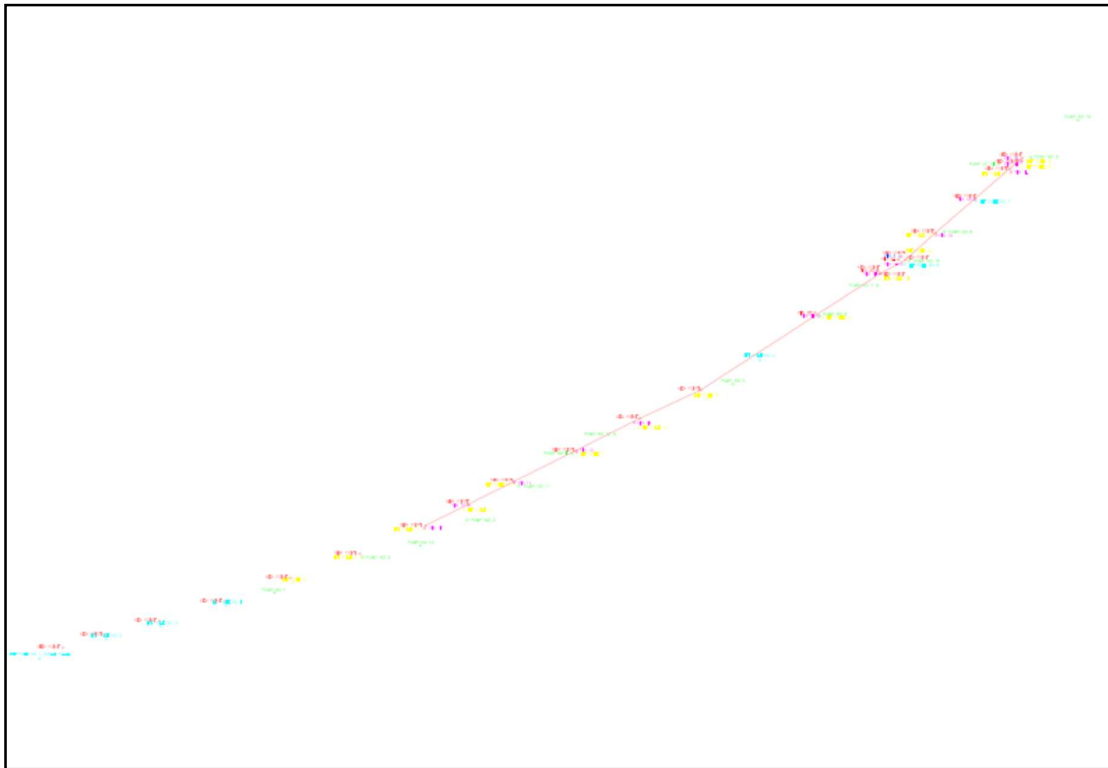
## 5. APPROACH AND METHODOLOGY

The proposed study area is located roughly 3 kilometres north of Mapungubwe Hill, alongside the Limpopo Riverbank. De Beers Venetia Diamond Mine abstracts most of its water from alluvial aquifers along the Limpopo on the farm Greefswald. For operational reasons, a powerline supplies energy to the boreholes for water abstraction to take place. The powerline is roughly 1.25 kilometres long and follows the boreholes located along the Limpopo River banks. The boreholes were established following a successful application for bulk water use license that is still valid. The electricity in the area was installed in early 1998. Over the past years, damaged electrical poles were exchanged at certain intervals owing to degradation caused by elements and insect attack. For example, some wooden electrical poles are eaten by termites and wood perkers, thereby reducing their structural integrity. This poses a huge threat to the environment and to wildlife if they fail to contain the load from above. Given these dangers, De Beers seeks to replace affected poles and to maintain the powerline. This will involve a replacement of poles and realignment of the powerline along the same path. Below table are the GPS coordinates of the proposed project start and end (see Figure 3).

		<b>Latitude</b>	<b>Longitude</b>
<b>PHASE 1</b>	<b>Start</b>	S22°.11. 38.08	E 29°.23.06.04").
	<b>End</b>	S22°.11.20.05	"E 29°.23.45.05").

The holes for the new poles will be placed in areas with the colour Pink (see Fig 4). The excavations will be monitored by the onsite team and Project Managers in case of chance discoveries. These individuals shall be trained on the Mine's Heritage Resources Procedure

aimed at the protection and conservation of any heritage resources. As specified in the Procedure, should any heritage resource be discovered during execution of the project, the activity will be stopped immediately, the area shall be barricaded, location marked by a GPS and a qualified archaeologist and the Parks Manager shall be notified. The archaeologist shall determine the appropriate process to be followed.



**Figure 4:**Proposed new poles indicated by the colour pink

The surrounding area landscape is dominated by irregular plains with ridges and hills, moderately open savanna with poorly developed grass. The study area falls within the Greefswald riparian forest, which occur in the rich alluvial deposit along the Limpopo Riverbank. Some of the common trees include fever berry bushes, *Sycamore figs*,

*Schlerocarya Birrea* and the *Nyala trees*. Various factors are thought to be responsible for the decline of the forest due to an increase number of elephants returned to the southern bank of the Limpopo River since the inception of the Park. Generally, the geology is dominated by well-established sediments including sandstones of the Clarens Formation with the weathered materials forming alluvium sand deposited annually during seasonal floods by the Limpopo River. Figures 5 to 13 show the nature of the project receiving environment.



**Figure 5:** Proposed project starting point





**Figure 6:** Main gravel access road that transverse alongside the powerline



**Figure 7:** Pipeline manhole



**Figure 8:** Borehole



**Figure 9:** Wood parkers nest and termite's activities



**Figure 10:** Electrical route alongside the gravel road



**Figure 11:** Damaged, scarred from the removal of bark by elephants



**Figure 12:** Borehole No:8 Switching station



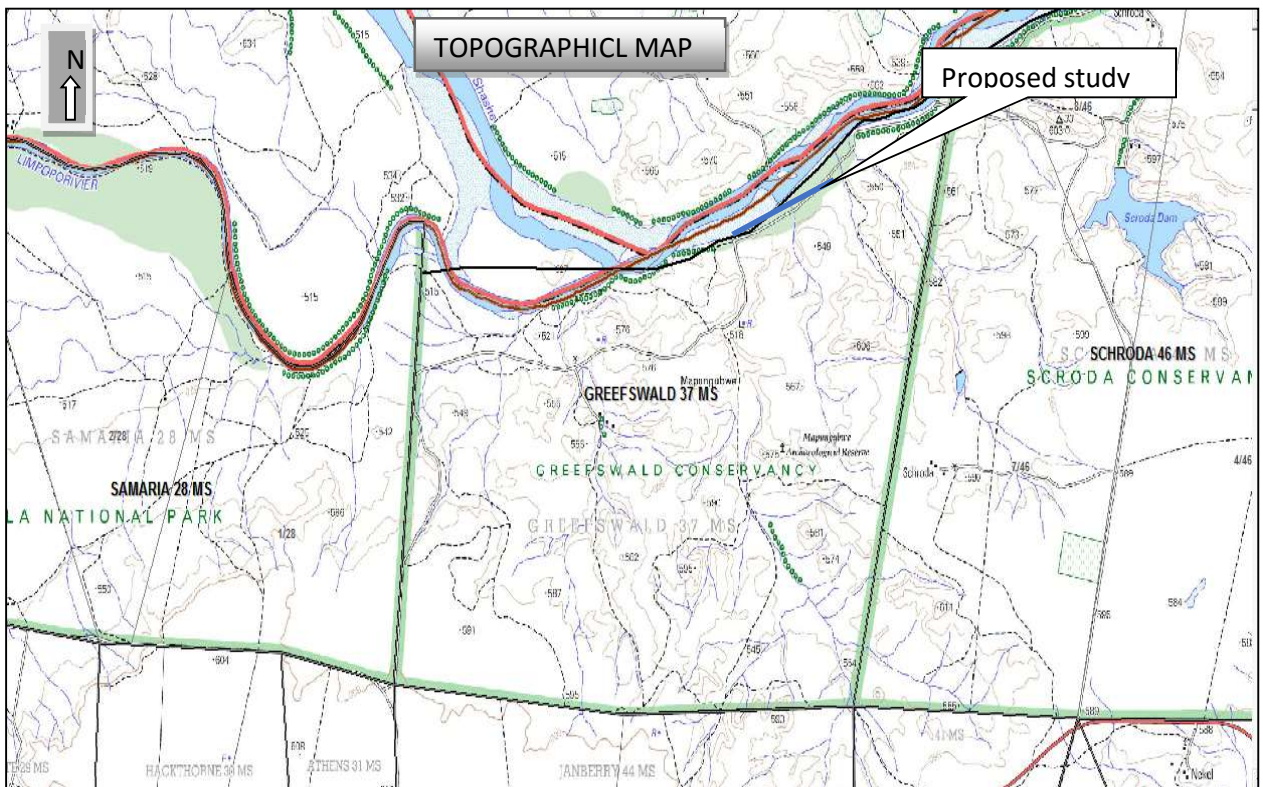
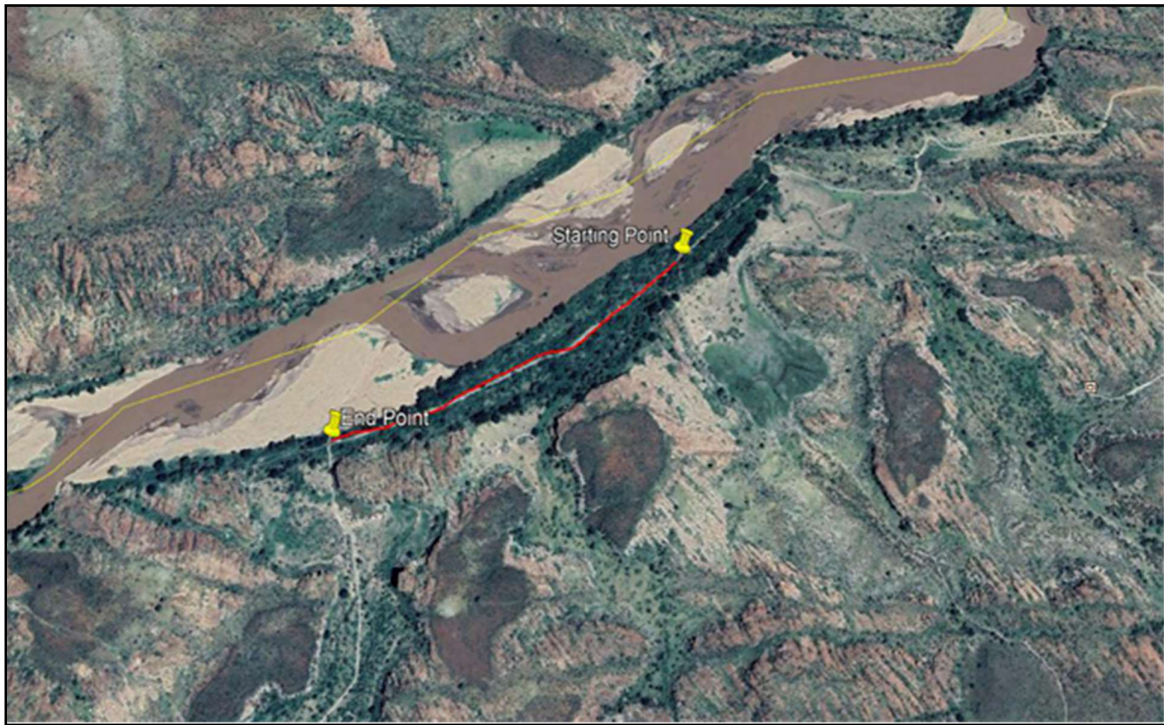
**Figure 13:** Project end

## **6. CONCLUSION**

The proposed project is part of routine maintenance of existing infrastructure. It is aimed at ensuring that damaged poles are replaced to allow for realignment of electrical lines thereby eliminating danger to the public and wildlife. In terms of impact area, the project will be performed along the existing powerline route and will use an access road used to service the water pipeline and the powerline along the Limpopo River.

Because the project takes place on a disturbed environment, ground clearing will be minimal. Also, no waste rock dumps will be created as there will be no extensive digging or ground disturbance. A ground inspection of the full length (and 50-meter corridor) of the proposed work area (1.25 km) identified no archaeological or heritage remains. In fact, the area is dominated by thick layers of alluvium deposits. However, although no archaeological remains were found, it is possible that some significant features might be buried beneath the alluvium sand. Therefore, the excavations will be monitored.

## 7. TOPOGRAPHICAL, GOOGLE EARTH MAPS AND SURVEY SNAPSHOT





**Figure14:** Snap short of the exiting powerline which transverse for 1,25kilomters alongside the Limpopo River.

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