PHASE 1 HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED TSWALU 22KV POWERLINE WITHIN TSWALU KALAHARI RESERVE NEAR HOTAZEL, NORTHERN CAPE.

Date: November 2021

Archaeology and Heritage Services

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DECLARATION OF INDEPENDENCE

This report has been compiled by Makhosazana Mngomezulu, principal archaeologist and heritage consultant. The views expressed in this report are independent of the author and no other interest was displayed during the decision-making process of the proposed Tswalu 22kV powerline.

SIGNATURE:

TERMINOLOGY

BP	Before Present
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
Ibid	*Ibidem*, Latin word meaning same as the previous source
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
NBKB	Ngwao-Boswa ya Kapa Bokone (Northern Cape Provincial Heritage Authority)
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African National Resources Agency
SAHRIS	South African Heritage Resources Information System
SAPS	South African Police Services
ya	years ago

DEFINITIONS

In situ: In the original place. No disturbance.

Chance finds: Archaeological and historical artefacts, features, structures and formal or informal burial of human remains that are found accidentally in context not previously identified during the site survey. Such findings are usually exposed by activities such as excavation.

ESA dates between 2 million ya to 2 00 000 BP. Industries associated with this time period includes Oldowan, Acheulean and Fauresmith. ESA stone tools include hammer stones, flakes, cores, handaxses and cleavers (Pelser 2009).

MSA dates between 2 00 000 and 25 000 to 20 000 BP, this varies with location. Industries associated with this time period includes the Howieson's Poort. The stone tools which characterise this period include scrapers, blades, points and flake.

LSA which dates between 25 000 and 20 000 to 2 000 BP. Stone tools of this period are characterised by their small size; this includes backed knives and borers (Pelser 2009).

Iron Age (IA) refers to a period of time where agropastoral (mixed farming) way of life began and grew as opposed to Stone Age hunter-gathering.

EIA dates to AD 200 – 900 (Huffman 2007).

MIA dates to AD 900 – 1300 (ibid).

LIA dates to AD 1300 – 1840 (ibid).

EXECUTIVE SUMMARY

The proposed project is a construction a 22kV powelrline that is 1.82km long. Vungandze Projects has been appointed to undertake a Phase 1 Heritage Impact Assessment in terms of the heritage significance on the proposed site.

During the physical survey conducted on 04 November 2021, no heritage resources were found on the proposed route, however Tswalu Kalahari Reserve has heritage sites like Rock Art sites within the property but far from the project. The proposed site is viable for the proposed project in terms of heritage; provided the proposed mitigation measures are adhered to.

The report will be submitted to the Relevant Heritage Resources Authority through SAHRIS (South African Resources Information System) for comments and for a decision as per the National Heritage Resources Act (Act No 25 of 1999). The proposed project can proceed from a heritage perspective pending a decision from SAHRA.

Project Structure

Introduction	• Report background • Methodology • Assumptions & limitations
Project locality	• Location (include mapping) • Heritage Background
Findings	• Types of findings • Mapping of findings • Assessment of findings • Level of significance • Possible impacts
Recommendations & conclusion	• Mitigation measures
Additional Information	• Applicable Legislation

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1. INTRODUCTION

The proposed project is a construction of a 22kV powerline. Vungandze Projects has been appointed to undertake a Phase 1 Heritage Impact Assessment in terms of the heritage significance on the proposed site. The construction of the proposed 22kV powerline is 1.82 km, hence the requirement of an HIA.

According to the National Heritage Resources Act (Act 25 of 1999), any person who intends to undertake a development must conduct a Heritage Impact Assessment to determine if there are any heritage resources along and within the proposed project; and if any resources are found, mitigation measures and recommendations for the protection of such resources need to be adhered to. Below is the heritage act with reference to the proposed project and why a heritage impact assessment should be conducted:

Based on Section 38 under Heritage Resources Management of the National Heritage Act 25 of 1999 the heritage resources in South Africa should be managed in the following:

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

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length".

The aim of this report is to outline anticipated impacts of the proposed Tswalu 22kV powerline on the proposed site and; if whether or not the chosen site is suitable for such a development in terms of heritage; and provide recommendations/mitigation measures as a way forward.

2. TERMS OF REFERENCE (TOR)

The approach used for this report was:

- Undertake a Phase 1 HIA in accordance with the NHRA.
- Identify and map all heritage resources in the proposed area and its surroundings, as defined in Section 3 of the NHRA, including archaeological sites on or close (within a 100m boundary of the site) to the proposed area.
- Assess the significance of any identified resources in terms of the heritage assessment criteria as set out in the South African Heritage Resources Agency (SAHRA) regulations.

- Provide mitigation measures to safeguard heritage resources identified on study area; and
- Comply with specific requirements and guidelines of Ngwao-Boswa ya Kapa Bokone (NBKB) and SAHRA.
- Submit final report to SAHRIS for comments and decision making.

3. METHODOLOGY

The physical survey was conducted and completed on 04 November 2021. This report is prepared according to the NHRA. Background research of the study area was conducted using literature such as books, journals, previously conducted HIA's on the study area and the internet before and after the site visit. The purpose of the research prior to the physical survey was to acquire information as to what to expect in the study area, the site visit was completed to identify heritage resources that may be impacted due to a construction of the proposed Tswalu 22kV powerline.

A heritage resource means any place or object of cultural significance [NHRA1999 (Act No. 25 of 1999)]. The NHRA was used as a source of reference to identify what is known as a heritage resource (see Appendix A Section 3 for list of heritage resources).

The survey was conducted on foot in order to record and locate any heritage resources within the study areas. The table from SAHRA Regulations will be used to grade the significance and evaluate the level of impact on the heritage resources identified.

Table 1: Site significance rating according to SAHRA.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade I	High Significance	Conservation; National Site nomination
Provincial Significance (PS)	Grade II	High Significance	Conservation; Provincial Site nomination
Local Significance (LS)	Grade IIIA	High Significance	Conservation: Mitigation not advised
Local Significance (LS)	Grade IIIB	High Significance	Mitigation (Part of site should be retained)

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.A)	-	Low Significance	Destruction

The determination of the effects of environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available from the Environmental Assessment Practitioner (EAP) through the process of the Environmental Impact Assessment (EIA). The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts. This is in line with specialist requirements as required by the client. For example, the request that:

The impact methodology (should) concentrate on addressing key issues. The methodology employed in the report thus allows for the evaluation of the efficiency of the process itself.

The following Assessment Criteria is used for Impact Assessment

Impacts can be defined as any change in the physical-chemical, biological, cultural and or socio-economic environmental system that can be attributed to humans. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability: describes the likelihood of the impact actually occurring

- **Improbable:** the possibility of the impact occurring is very low, due to the circumstances, design or experience.

- **Probable:** there is a probability that the impact will occur to the extent that provision must be made therefore.
- **Highly probable:** it is most likely that the impact will occur at some stage of the development.
- **Definite:** the impact will take place regardless of any prevention plans and there can only be relied on mitigation measures or contingency plans to contain the effect.

Duration: the lifetime of the impact

- **Short Term**: the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- **Medium Term:** the impact will last up to the end of the phases, where after it will be negated.
- **Long Term:** the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent:** the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: the physical and spatial size of the impact

- **Local:** the impacted area extends only as far as the activity, e.g. footprint
- **Site:** the impact could affect the whole or measurable portion of the abovementioned property.
- **Regional:** the impact could affect the area including the neighbouring residential areas.

Magnitude/Severity: Does the impact destroy the environment, or alter its function

- **Low:** the impact alters the affected environment in such a way that natural processes are not affected.
- **Medium:** the affected environment is altered, but functions and processes continue in a modified way.
- **High:** function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- **Negligible:** the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- **Low:** the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- **Moderate:** the impact is of importance to one or more stakeholders, and its intensity will be

medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

- **High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability (*Table -2*)

S = Significance weighting; Sc = Scale; D = Duration; M = Magnitude; P = Probability

Table 2: The significance weighing for each potential impact are as follows:

Aspe	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20

	Low	>20≤40
	Moderate	>40≤60
	High	>60

3.1 Assumptions

It was assumed based on the aerial view from Google Earth and literature review that the study area might yield heritage resources such as stone tools because it seemed not to be disturbed.

3.2 Limitations

No limitations were encountered on site during the survey.

4. LOCALITY AREA

The study area is located within Tswalu Game Reserve near Hotazel in the Northern Cape. The site can be accessed through the R31 road to Van Zylsrus/Kgaladadi Transfrontier Park to the D3335 dirt road (figure 1-3). The project site is situated on GPS Co-ordinates: 27° 13' 33.77"S; 22° 26' 24.74"E, these were taken at the restaurant next to the old powerline. The site is an open veld with short to medium grass and patches dense vegetation (figure 4-11).

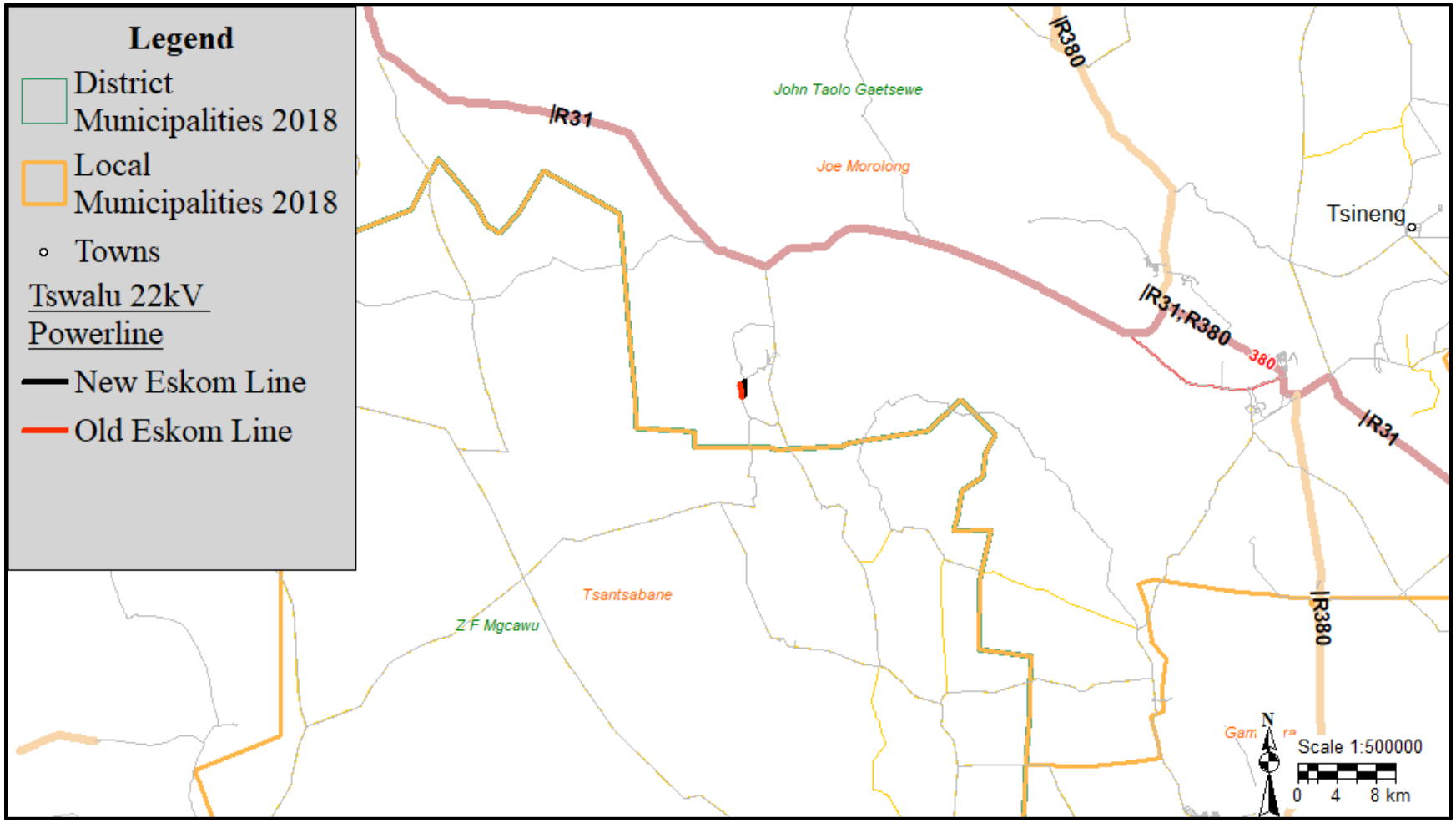

Figure 1: Locality map of the study area

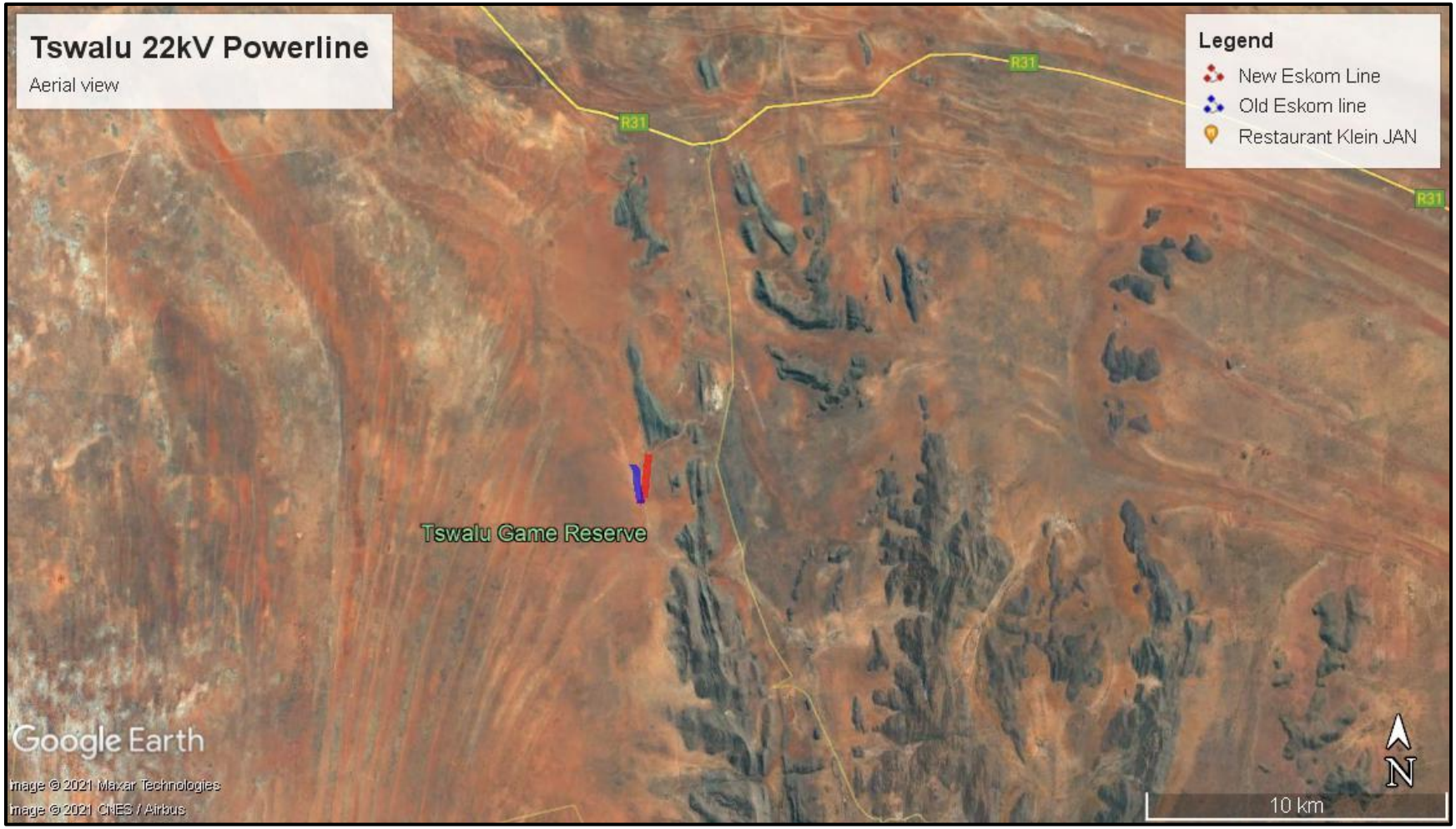

Figure 2: Aerial view of the proposed study area and surrounding areas.

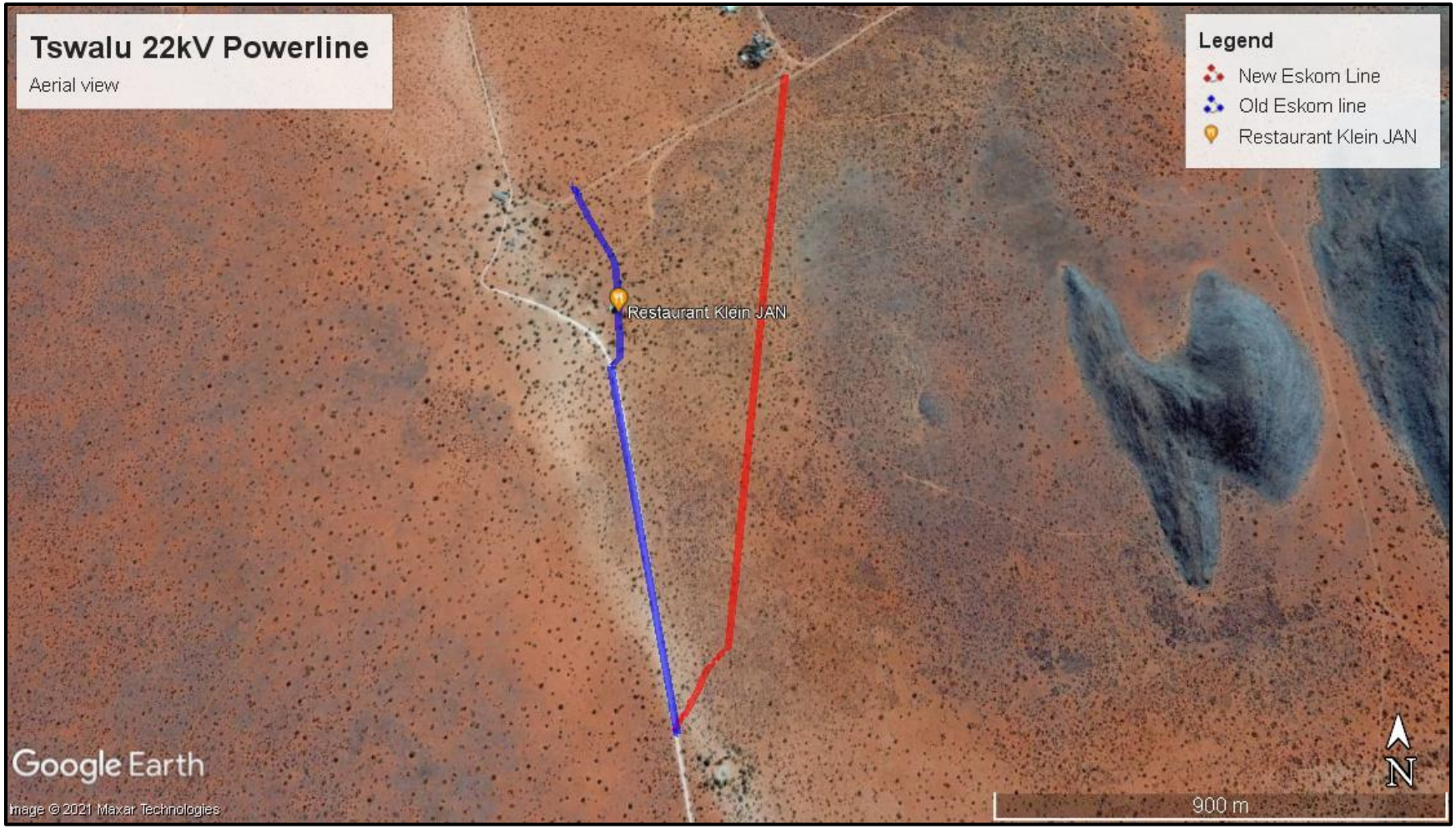

Figure 3: Close aerial view of the proposed study area.

5. IMAGES OF THE STUDY AREA

Figure 4: Tswalu Kalahari Reserve reception.

Figure 5: Restaurant.

Figure 6: Existing powerline.

Figure 7: Marker for the proposed line.

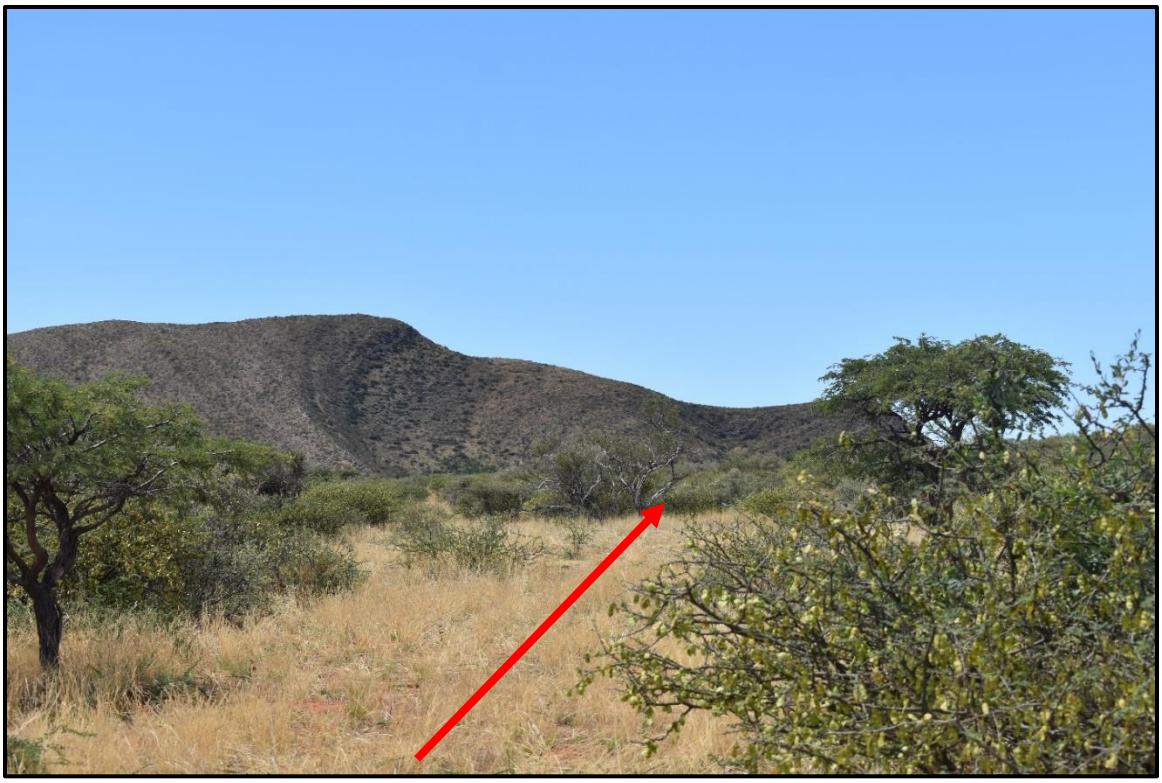

Figure 8: Route of the proposed line (red line).

Figure 9: Vegetation on site.

6. HISTORICAL BACKGROUND OF THE STUDY AREA

History of human activity in South Africa, as in all parts of the world, dates to millions of years. It is important to elaborate as far back in time to enable the reader to understand what is meant by archaeological material and why is it declared a heritage resource. Archaeological materials are divided into two periods, the Stone Age, and the Iron Age. Late Iron Age marks the transition between prehistory and history, a period of colonial era until recent. Archaeological sites have been reported in the Northern, especially Early Stone Age and Middle Stone Age; this however does not exclude Iron Age sites. Furthermore, Heritage assessments that have been conducted due to different developments have also contributed vastly in identifying sites that are of heritage significance.

6.1 Stone Age Archaeology:

The Stone Age is a period that dates between 2 million years ago (ya) to 2000 ya. Due to the vast character found within stone tools of this period, it was then divided into three phases: Early Stone Age (ESA), Middle Stone Age (MSA) and the Late Stone Age (LSA). ESA dates between 2 million ya and 200 000 Before Present (BP). Industries associated with this time includes Oldowan, Acheulean and Fauresmith. ESA stone tools include hammer stones, flakes, cores, hand axes and cleavers (Pelser 2009). The more refined stone tools appeared during the MSA. MSA dates between 200 000 and 25 000 to 20 000 BP, this varies with location. Industries associated with this period includes the Howieson's Poort. The stone tools which characterise this period include scrapers, blades, points, and flake. Lastly is the LSA which dates between 25 000 and 20 000 to 2 000 BP. Stone tools of this period are characterised by their small size; this includes backed knives and borers (Pelser 2009).

Binneman and Beaumont (1992), examined two chert handaxes from Wonderwerk Cave, predating ca 350 000 BP, for use-wear traces. Wonderwerk Cave is situated on the farm Wonderwerk, about halfway between the towns of Kuruman and Danielskuil. The tunnel-like cave runs for 139 m horizontally into the base of a low ridge which is part of the Kuruman Hills. It is one of few cave sites in southern Africa to contain a Stone Age sequence ranging from the Acheulean up until historic times.

The Acheulean artefacts are associated with well-preserved bone remains and calcified plant material. A few cave sites in southern Africa contain Earlier Stone Age implements, these are

usually manufactured of local quartzites or other raw materials which are not suitable for microscopic investigation. However, recent excavations at Wonderwerk Cave in the northern Cape yielded Acheulean handaxes manufactured of chert which are suitable for microscopic examination. Together with techniques developed in recent years mainly by Keeley (1980), it is now possible to examine and study the wear traces on stone tools to gain some insights into possible functions of stone tools. Keeley established from experimental use of stone tools that different materials, such as wood, bone, hide, antler and meat leave distinct wear traces on the surfaces of stone tools. These wear traces can be identified between 200x and 400x magnification.

Of the four Acheulean handaxes initially received for analysis, two from the Kathu Pan phase predating ca 350 000 BP, were selected for analysis. The Kathu Pan phase of the Acheulean refers to aggregates produced prior to 350 000 BP, that are distinguished by very refined 'classical' handaxes, the absence of any form of prepared core, and a flake component that is limited to approximately 'square' irregulars with a modest incidence of dorsal cortex.

The results showed that both handaxes examined in this study displayed similar macro-morphological use-wear features; these closely correspond to those found on Later Stone Age adzes of the Wilton Industry, which were actively used in working vegetal materials, such as wood. Although the sample is very small, Binneman and Beaumont propose that handaxes could be divided into different classes by means of edge use-wear characteristics (Binneman and Beaumont 1992).

Li et al (2017), looked at the earliest prepared core technology in the Acheulean at Canteen Kopje and implications for the cognitive evolution of early hominids. The Acheulean (approx. 1.7–0.3 Ma) has long been regarded as a highly successful, stable technological adaptation [1–5]. This stability is in part demonstrated by the continuity of tool types, including handaxes, picks and cleavers (collectively referred to here as large cutting tools—LCTs), which persist in Africa from their first occurrence at approximately 1.76Ma until the shift to the Middle Stone Age (MSA) at approximately 200 ka.

Prepared core technology illustrates in-depth planning and the presence of a mental template during the core reduction process. This technology is, therefore, a significant indicator in studying the evolution of abstract thought and the cognitive abilities of hominids. This report looks at Victoria West cores excavated from the Canteen Kopje site in central South Africa, with a preliminary age estimate of approximately 1Ma (million years ago) for these cores. Technological

analysis shows that the Victoria West cores bear similarities to the 'Volumetric Concept' as defined for the Levallois, a popular and widely distributed prepared core technology from at least 200 ka (thousand years ago).

Although these similarities are present, several notable differences also occur that make the Victoria West a unique and distinctive prepared core technology; these are: elongated and convergent core shapes, consistent blow directions for flake removal, a predominance of large side-struck flakes, and the use of these flakes to make Acheulean large cutting tools. This innovative core reduction strategy at Canteen Kopje extends the roots of prepared core technology to the latter part of the Early Acheulean and clearly demonstrates an increase in the cognitive abilities and complexities of hominids in this time period (Li et al 2017).

An HIA study conducted by Pelser & van Vollenhoven in 2011 showed more evidence of stone age sites in the Northern Cape. A total of 14 sites with a Stone Age origin were recorded during the survey. It is however envisaged that many more sites could still be uncovered in the area, with fairly dense grass cover in certain areas, as well as red Aeolian sand dunes, rendering them invisible. Two sites (6 and 7) fall outside the area we had to survey. The existing old railway bridge, adjacent to the area where the new rail crossing is proposed, can be considered the 15th site.

The sites are characterized by scatters of flakes, cores and more formal tools (ESA to MSA/LSA), situated in erosion dongas and quarries, as well as in calcrete formations overlain by red (Aeolian) sand dunes. In certain areas the red sand dunes are being eroded (wind erosion), exposing the calcretes and Stone Age artefacts. The sites vary from low density scatters with only a few artefacts, to areas with literary thousands of cores, flakes and more formal tools. The significance of the sites is seen as medium to high (Pelser & van Vollenhoven 2011).

An HIA study conducted by Kusel 2009, is another evidence of more Stone Age sites in the area. According to Kusel (2009) during the survey lithic occurrences were found to be localised. However, there is always the possibility that sub-surface archaeological sites may be revealed through the proposed mining activities. The survey determined that stone artefacts were not prolific within the area of the proposed development and mainly isolated specimens were found. Only one locality with evidence of knapping/utilisation was identified within the footprint. The lithics occurred within pebble and gravel levels overlying the calcrete formations within the ancient river bed of the Ga-Mogara River. The lithics apparently eroded from a borrow pit of approximately 500 x 100 meters in the river bed where materials for road construction/building purposes have been

removed. The lithics occurred within a broad pebble band on the edge of the calcrete borrow pit and have evidently been exposed from an underlying horizon during the quarrying activities.

Due to the density of good quality raw material in the form of pebbles significant knapping activities took place over time as evidenced by high frequencies of in particular cores. The collection represents a mix of mainly ESA and MSA cores, flakes, blades and waste from stone tool knapping and other lithic reduction processes. Flakes, blades and bladelets are the main products of any stone reduction process. The collection includes one example that seems similar to a ESA chopper, but is more likely to be a pebble core with flake removals as the Oldowan is known from only a few sites. A number of formal ESA tool types were present among the exposed lithics. Most of the formal tools are typical ESA Acheulean handaxes, or large cutting tools (LCT's). These handaxes/bifaces are classified as formal tools, because they have been shaped or transformed into a specific shape and have been given a cutting edge through secondary retouch (i.e. by removing small flakes). Significant numbers of the MSA flakes and blades retain faceted striking platforms that indicate the use of the core preparation technique (Kusel 2009).

6.2 Iron Age Archaeology

According to Huffman (2007) Iron Age marks the early evidence of farming community in Southern Africa. Animal husbandry, crop farming, pottery and metal working were introduced which in due time liberated hunter gatherers to change their way of life which is less mobile (Carruthers 1990). Due to vast technological discrepancies and settlement pattern within this period, it was divided into three. The Early Iron Age (EIA) dates to AD 200 – 900, Middle Iron Age (MIA) dates to AD 900 – 1300, and the Late Iron Age (LIA) dates to AD 1300 – 1840 (Huffman 2007).

During the physical survey, no Iron Age sites, or associated material were found in the proposed powerline route. LIA sites have been recorded north west of Kuruman in Thlaping capital Dithakong; the area is known for its extensive stonewalled settlements. Thickeray et al (1983) reported on the excavation that took place at the Blinkklipkop Specularite Mine Near Postmasburg, Northern Cape, this is south of the Tswalu pass Kuruman. The Blinkklipkop archaeological site is a prehistoric specularite mine located in the hillside of a distinctive ironstone outcrop, known as Blinkklipkop or Gatkoppies, about 5 km north-east of Postmasburg in the northern Cape. A trench 8 x 1 m was excavated in the man-made cave area. Radiocarbon dates indicate that specularite mining at Blinkklipkop began some time before 1200 B.P.

3 580 lithic artefacts in total were recovered in all layers. Retouched artefacts, including a few crudely worked scrapers and miscellaneous pieces, account for less than 1% of the total. Flakes are the predominant class by far and account for more than 90% of all artefacts in every layer. Many of the flakes were probably produced during the preparation and use of mining tools and are characterized by marked bulbs of percussion, frequent hinge fractures and cortex usually present on the dorsal surface. Blades are rare and only one bladelet core was found. The presence of battered ironstone artefacts best described as 'mining tools' indicates that stone tools were used to mine specularite at least some of the time. Although no metal mining tools were recovered, it is presumed that metal tools were used in more recent times because of the neat cut marks visible on some areas of the walls where soft red non-brittle haematite occurs.

The evidence from Blinkklipkop indicates that pottery appeared in the Postmasburg area by at least 1200 B.P. This is older than the previously suggested date of only 400 B.P. for the appearance of pottery in the northern Cape (Humphreys 1979; Klein 1979). The occurrence of sheep/goats (and possibly cattle) in the Blinkklipkop deposits by 1200 B.P. is also of interest as it provides evidence for the presence of domestic stock in the northern Cape by 1200 B.P (Thickeray et al in 1983).

6.3 History of Tswalu Kalahari Reserve

The many San Engraving sites at Tswalu testify to the importance with which earlier inhabitants regarded the green Kalahari. It gave them sanctuary and both physical and spiritual nourishment. During the 20th Century, this link between people and their surroundings was disrupted by attempts at cattle farming and hunting. In Setswana, Tswalu means a ‘new beginning’ and we are aiming to deliver exactly that: a fresh era of hope for the people and wildlife of one of South Africa’s last great wilderness areas.

Tswalu is a conservation-in-progress. Damage caused by previous, farming endeavours is being repaired, with fences and structures being removed, and natural processes are being restored. Tswalu’s national and regional importance as a habitat was acknowledged in 2014 when it was designated as a formally protected area.

Research teams are accommodated at the Dedeben Research Centre, a complex of repurposed buildings that originally dates back to to the late 1880s when a remote outpost of the Cape Mounted Rifles was built on this site. At the time of its inception, this police outpost was the most northerly police station in the old Gordonia province of South Africa, and camels were used for

mounted patrols. The original buildings on the site were replaced in the early 1970s, creating more modern facilities that remained active until its closure in 1990.

Dedeben stood empty and derelict until taken over by Tswalu in 2000, when the main office block became a primary health care centre and the station houses used for staff accommodation. With the increased interest in research on Tswalu and the formation of the Tswalu Foundation, the decision was taken to repurpose Dedeben once again by converting it into a research centre while still maintaining the integrity of the facility in terms of its historic value (tswalu.com).

7. FINDINGS

During the survey, no heritage resources were found within the proposed route. It should be noted however that heritage resources have been recorded within the property, Tswalu Kalahari Reserve; this includes 2 rock art sites and the now replaced buildings of Dedeben Research Centre. Not far from the property, there is another excavation underway at Sonstraal where archaeological material such as the stone tools have been found.

Sonstraal is situated at approximately 11km north of the proposed powerline at coordinates 27° 7' 19.56"S; 22° 27' 51.12"E. Dedeben Research Centre is situated at approximately 7.35km southeast of the proposed powerline at coordinates 27° 17' 15.36"S; 22° 29' 8.52"E. Rock Art site 1 is situated at approximately 10.45km northeast of the proposed powerline at coordinates 27° 9' 46.08"S; 22° 31' 34.68"E. Rock Art site 2 is situated at approximately 14.20km southeast of the proposed powerline at coordinates 27° 20' 12.12"S; 22° 31' 32.88"E.

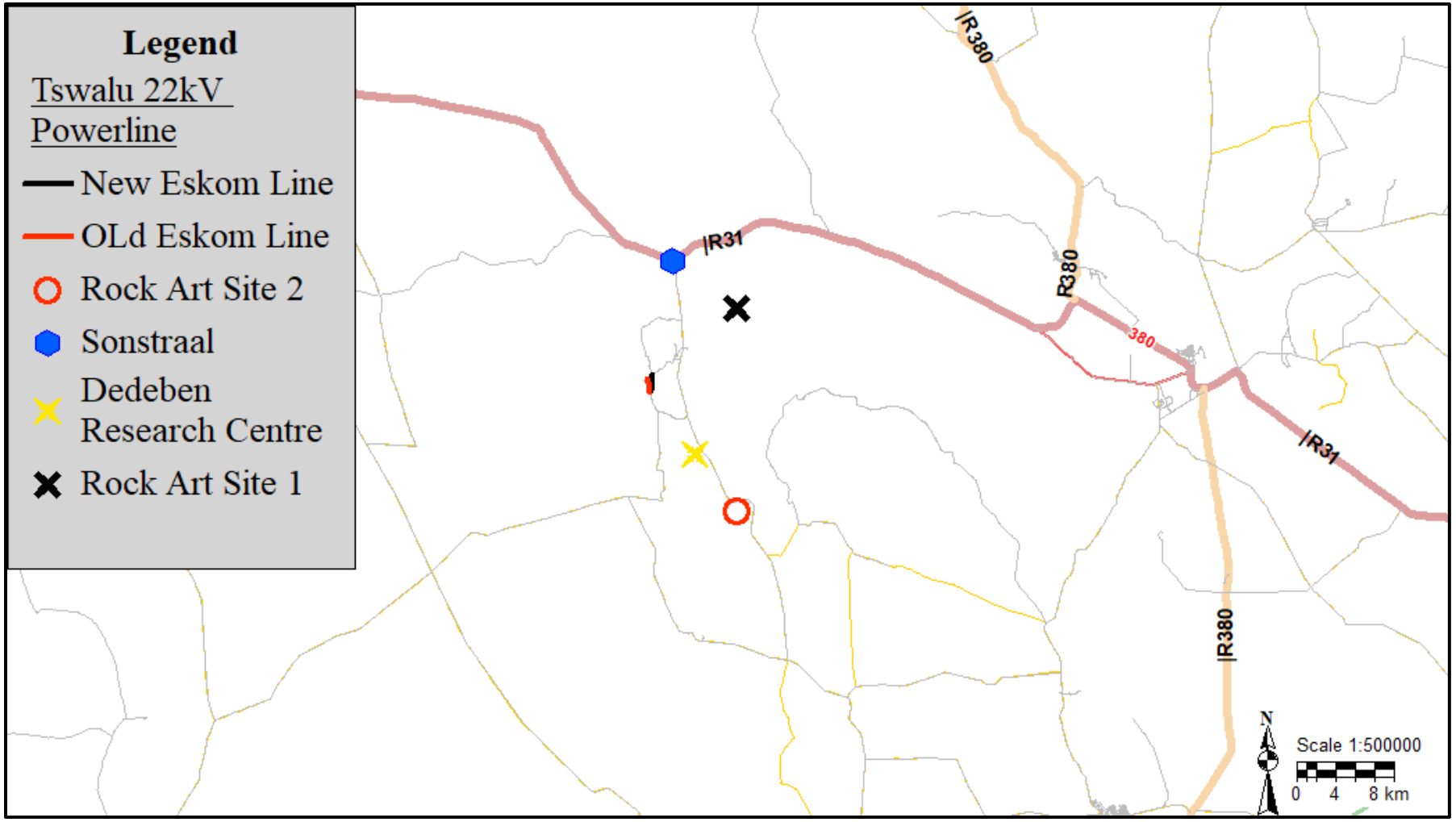

Figure 10: Heritage sites found in close proximity of the proposed route.

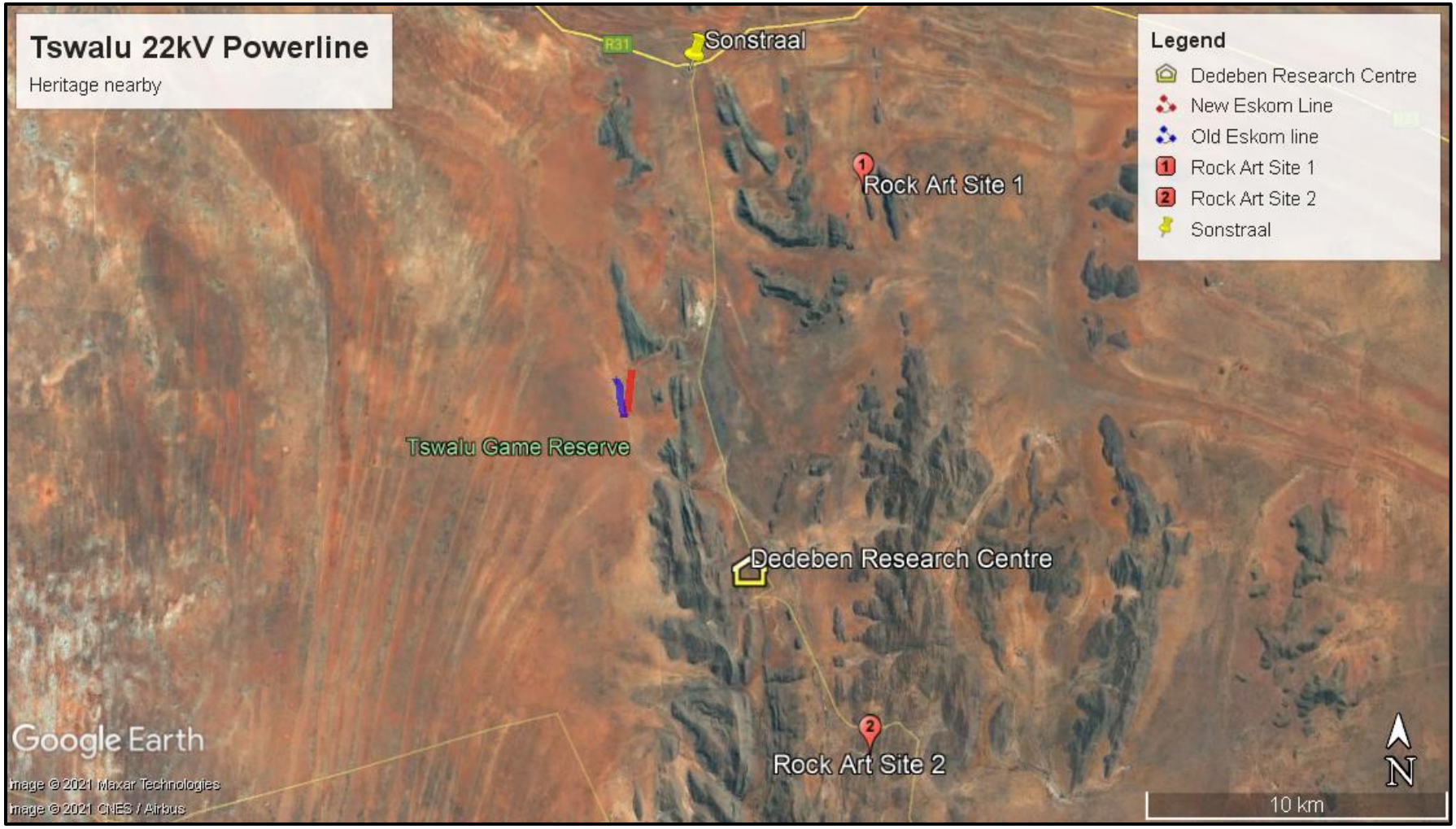

Figure 11: Aerial view of heritage sites in close proximity.

8. IMPACT ASSESSMENT

The proposed Tswalu 22kV powerline will impact the proposed site during the construction phase due to disturbance of the ground. This means, because of the history of the area it has a high possibility of uncovering archaeological material such as stone tools that may be *in situ*. Should any heritage resource be discovered that were not initially noted during the survey, the proposed recommendations should be used as reference on how to handle and protect heritage resources. This section evaluates the extent of the impact WITH and WITHOUT mitigation measures in relation to the project under study.

*Table 3: Evaluation of the impacts of the project on the heritage resource **WITHOUT** mitigation measures.*

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	

	Negligible	≤20
	Low	>20≤40
	Moderate	>40≤60
	High	>60

Results: 5+3+8×5 = 80 i.e >60

This means without mitigation measures; the impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

*Table 4: Evaluation of the impacts of project on the structures **WITH** mitigation measures.*

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20

	Low	>20≤40
	Moderate	>40≤60
	High	>60

Results: (3x1x6) ×2 = 36 i.e. >20≤40

The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

8.1 Construction Phase

8.1.1 Impact

Discovery of heritage resources such as burial grounds and graves and stone tools is a probability and/or cannot be ruled out in the construction phase, due to ground disturbance as a result of excavations.

8.1.2 Mitigation measure

Should potential human remains and/or stone tools be found on site, the contractor should cease construction immediately and the South African Police Service and the client should be contacted for human remains, and a professional archaeologist for the stone tools.

8.2 Operational Phase

8.2.1 Impact

No heritage impacts are anticipated during the operational phase.

8.2.2 Mitigation measure

No mitigation measure proposed.

8.3 Decommissioning Phase

8.3.1 Impact

No heritage impacts are anticipated during the operational phase.

8.3.2 Mitigation measure

No mitigation measure proposed.

8.4 Site Significance

The level of significance of the site and the cultural resources varies between social, historical, spiritual, scientific and aesthetic value.

Social value is when a place has become a focus of spiritual, political, national, or other cultural sentiments to a majority or minority group. This may be because the site is accessible and well known, rather than particularly well preserved or scientifically important (SAHRA Regulations). The proposed site has no social value.

Historical value refers to areas where historical events took place, and such events have high significance either locally, regionally, provincially, or nationally. The proposed site has historical value with all these historical sites found within the property.

Scientific value refers to the importance of the study area for research purposes. The study areas have scientific value, with Dedeben Research Centre within the property.

Aesthetic value refers to the unique beauty of the site. The study area has aesthetic value with rock art site within the property.

Based on the level of significance, Tswalu Kalahari Reserve has medium heritage significance.

9. RECOMMENDATIONS AND CHANCE FINDINGS

- During the construction phase, the contractor should keep within the proposed parameters of the proposed site.
- The contractor should induct all employees on the importance of heritage sites and resources that they should not be impacted in any way. This is to ensure that even if any heritage resources are found during the construction phase or exposed due to construction activities, should by no means be impacted or destroyed.
- Should heritage resources be found on site during excavation; be it archaeological artefacts such as stone tools and/or pottery; burial grounds and graves; the contractor

should cease construction immediately and contact the client. A professional archaeologist should be called to site to assess the significance of the archaeological material and the impacts of the proposed activities on such materials, and then provide mitigation measures.

- The possibility of uncovering unearthed human remains and shallow grave(s) should not be ruled out. Should potential human remains be found on site, the contractor should cease construction immediately and the South African Police Service and the client should be contacted. Should the remains be below 60 years old since time of death, it is considered a forensic case and further investigations should be conducted by the police and should the remains be above 60 years old since time of death, it becomes a South African Heritage Resources Agency case. This means an archaeologist should be called on site to remove the remains at the expense of the client.
- It should be noted that no heritage resources should be removed on site without a permit application from SAHRA.

10. CONCLUSION

In conclusion, no heritage resources were found within the proposed route, however, Tswalu Kalahari Reserve has heritage sites like Rock Art sites within the property but far from the project. As such the proposed route has low significance from a heritage perspective. Chances of finding burial grounds and graves and/or stone tools on the proposed route should not be ruled out especially during construction phase. The proposed project may proceed provided mitigation measures and recommendations provided are adhered to and implemented.

The final report will be submitted on through SAHRIS to the relevant heritage authority for review and for a decision. Furthermore, subject to approval from SAHRA we recommend the approval to proceed with the proposed Tswalu 22kV powerline in terms of the NHRA.

11. REFERENCES

Binneman, J. Beaumont, P. 1992. Use-Wear analysis of two Acheulean Handaxes from Wonderwerk Cave, Northern Cape. Southern African Field Archaeology 1:92-97.

Carruthers, V. 2000. The Magaliesberg. Pretoria: Protea Book House.

Huffman, T. N 2007. *Handbook to the Iron Age*. The archaeology of Pre-Colonial farming societies in southern Africa. University of KwaZulu Natal Press. South Africa.

Humphreys, A. J. B. 1979. The Holocene sequence in the northern Cape and its position in the prehistory of South Africa. Unpublished Ph.D. thesis: University of Cape Town.

Keeley, L.H. 1980. Experimental determination of stone tools: a microwear analysis. Chicago: Chicago University Press.

Klein, R. G. 1979. Palaeoenvironmental and cultural implications of late Holocene archaeological faunas from the Orange Free State and north-central Cape Province, South Africa. South African Archaeological Bulletin 34: 34-49.

Kusel, U. S. 2009. Cultural Heritage Resources Impact Assessment of Manganese Mining Areas on The Farms Belgravia 264, Santoy 230, Gloria 226 And Nchwaning 267, At Black Rock, North of Kuruman, Kgalagadi District Municipality, Northern Cape Province.

Li H, Kuman K, Lotter MG, Leader GM, Gibbon RJ. 2017 The Victoria West: earliest prepared core technology in the Acheulean at Canteen Kopje and implications for the cognitive evolution of early hominids. Royal Society Open Science 4: 1-12.

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

Pelser, A. 2009. Travelling through Time: Archaeology and the Vredefort Dome. In: Reimold, U. & Gibson, R. (eds) *Meteorite Impact!* The Danger from Space and South SAHRA APM. May 2007. Guidelines: Minimum standards for the archaeological and paleontological components of impact assessment reports.

Pelser, A.J. & van Vollenhoven, A.C. 2011. A Report on a Heritage Impact Assessment (HIA) for a Proposed New Rail Crossing Over the Gamagara River for The Gloria Mine Operations, Assmang Black Rock, on Gloria 266, North of Hotazel, Northern Cape.

Thackeray, A.I. Thackeray, J.F. Beaumont, P.B. 1983. Excavations at the Blinkklipkop Specularite Mine near Postmasburg, Northern Cape. South African Archaeological Bulletin 38:17-25

APPENDIX A

LIST OF LEGISLATION APPLICABLE TO THE SITE

12. LEGISLATION

National Heritage Resources Act 25 of 1999

12.1 Section 3 of the NHRA 25 of 1999

According to Section 3 under **National Estate** of the National Heritage Act 25 of 1999 the heritage resources in South Africa includes the following:

"(1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

(2) Without limiting the generality of subsection (1), the national estate may include –

(a) places, buildings, structures and equipment of cultural significance;

(b) places to which oral traditions are attached or which are associated with living heritage; (c) historical settlements and townscapes;

(d) landscapes and natural features of cultural significance;

(e) geological sites of scientific or cultural importance;

(f) archaeological and paleontological sites;

(g) graves and burial grounds, including—

(i) ancestral graves;

(ii) royal graves and graves of traditional leaders;

(iii) graves of victims of conflict;

(iv) graves of individuals designated by the Minister by notice in the Gazette;

(v) historical graves and cemeteries; and

(vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);

(h) sites of significance relating to the history of slavery in South Africa;

(i) movable objects, including:

(i) objects recovered from the soil or waters of South Africa, including archaeological and paleontological objects and material, meteorites and rare geological specimens;

(ii) objects to which oral traditions are attached or which are associated with living heritage;

(iii) ethnographic art and objects;

(iv) military objects;

(v) objects of decorative or fine art;

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

(3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of –

(a) its importance in the community, or pattern of South Africa's history;

(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

(c) its potential to yield information that will contribute to an understanding of

South Africa's natural or cultural heritage;

(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;

(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;

(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and

(i) sites of significance relating to the history of slavery in South Africa".

12.2 Section 36 of NHRA 25 of 1999

According to Section 36 under **Burial grounds and graves** of the National Heritage Act 25 of 1999 the graves in South Africa are protected as follows:

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3)(a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) 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

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation

and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers 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 resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7)(a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

12.3 Section 38 of NHRA 25 of 1999

According to Section 38 under Heritage resources management of the National Heritage Act 25 of 1999 the heritage resources in South Africa should be managed in the following:

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

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection (1)—

(a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or

(b) notify the person concerned that this section does not apply.

(3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(a) The identification and mapping of all heritage resources in the area affected;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(c) an assessment of the impact of the development on such heritage resources;

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development, decide—

(a) whether or not the development may proceed;

(b) any limitations or conditions to be applied to the development;

(c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

(d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

(e) whether the appointment of specialists is required as a condition of approval of the proposal.

(5) A provincial heritage resources authority shall not make any decision under subsection (4) with respect to any development which impacts on a heritage resource protected at national level unless it has consulted SAHRA.

(6) The applicant may appeal against the decision of the provincial heritage resources authority to the MEC, who—

(a) must consider the views of both parties; and

(b) may at his or her discretion—

(i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the responsible heritage authority; and

(ii) consult SAHRA; and

(c) must uphold, amend or overturn such decision.

(7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by SAHRA unless the authority concerned decides otherwise.

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

(9) The provincial heritage resources authority, with the approval of the MEC, may, by notice in the Provincial Gazette, exempt from the requirements of this section any place specified in the notice.

(10) Any person who has complied with the decision of a provincial heritage resources authority in subsection (4) or of the MEC in terms of subsection (6) or other requirements referred to in subsection (8), must be exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 must continue to apply.