

ESKOM: HIA STUDY FOR THE HOUSEHOLD ELECTRIFICATION INFRASTRUCTURE OF THE PROPOSED 22KV POWERLINE FOR EITHER NORLIM-TAUNG (15KM) AND NORLIM-DIKHUTING (13KM) IN THE BUXTON AREA, GREATER TAUNG MUNICIPALITY, NORTH WEST PROVINCE.

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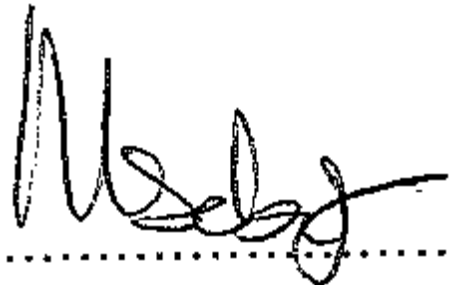
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NATIONAL LEGISLATION AND REGULATION GOVERNING THIS REPORT

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

I, **Trust Mlilo**, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

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Independence

The views expressed in the document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under MuTingati & Project consulting. MuTingati and appointed associate has no any business, personal, financial or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. MuTingati Environmental & Project and appointed associates, reserve the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author and the relevant team from MuTingati Environmental division. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to

this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

1. Executive Summary

Item	Description
Proposed development and location	Electrification infrastructure of two 22kv power lines; from the existing Norlim to Taung (15km) and from the existing Norlim sub-station to Dikhuting (13km) in the Greater Taung Local Municipality, Northwest Province.
Purpose of the study	To carry out a Heritage Impact Assessment to determine the presence/absence of cultural heritage sites and the impact of the proposed project on heritage resources within the area demarcated for the two 22kv power lines.
1:50 000 Topographic Map	2724 DA and 2724 DB
Coordinates	From S 27° 37 ' 19.16"; E 24° 38 23 ' .69" to S 27° 37 ' 22.20"; E24° 38 ' 15.37"
Municipalities	Greater Taung Local Municipality, Dr Ruth Mompati District
Predominant land use of surrounding area	Residential and agriculture
Developer	Eskom
Contact Person	Mulalo Muelelwa (Eskom Environmental Officer)
Contact Details	Tel: (018) 464 6936, Cell: 071 8708 511, Email: MuelelMM@eskom.co.za
Heritage Consultant	MuTingati Environmental & Projects (Pty) Ltd
Date of Report	Final Draft report 2 24/ 04/ 2017
Consultant contact	Charlotte Maphaha (charlotte@mutingati.co.za)

The Taung Skull Fossil Site, on whose buffer zone, the proposed project is located, was listed in 2005 as an extension of the Fossil Hominid Sites of Sterkfontein, Swartkrans, Kromdraai and Environs (1998), together with the Makapan Valley Heritage Site (2005). The Fossil sites complete the eight World Heritage site for South Africa. It was at the Taung Skull Fossil Site, where in 1924, the celebrated Taung Skull – a specimen of the species *Australopithecus africanus* – was found. Apart from this, several Stone Age and palaeothological material, some of which are as yet undescribed, but covering a staggering 2.2 billion years, were also recovered (BCK 2004).

The historic Buxton Village is also partly located on the edge of the economical buffer zone for the Taung Skull Fossil Site (Figure 1). This close proximity demands adaptive management strategies as proposed by Salafsky *et al.* (2001: 12) that embrace both use and preservation (Carter and Grimwade 1997: 45) and allows the people in the Buxton village to receive basic amenities. This means that heritage managers should place extra efforts into developing not only legally compliant measures, but also practical and sustainable management guidelines that considers the needs of local communities and competing land uses. To this end, Eskom applied for heritage exemption of their two proposed minor reticulation 22kv power lines that all originate from Norlim before branching to Taung and Dikhuting (SAHRA Case No. 9141). SAHRA recommended that a suitably qualified palaeontologist and archaeologist must examine proposed power lines before submitting either letter of exemption or a full PIA/HIA. Construction activities on the areas outside the Taung Skull Fossil Site and buffer zone are currently on hold awaiting finalization of SAHRA's requirements and comments. As such, Eskom appointed Trans-Africa Projects who then subcontracted MuTingati Environmental Consultants to examine the known sensitive (from the existing Norlim Substation up to about 2km of the power lines) because part of the proposed power lines fall within the buffer zone of the site. No new infrastructure will be built at the existing Norlim Substation and the new power lines will run along the existing bigger 66kv power line for whole stretch of the sensitive area until about 1km before branching north and southwards.

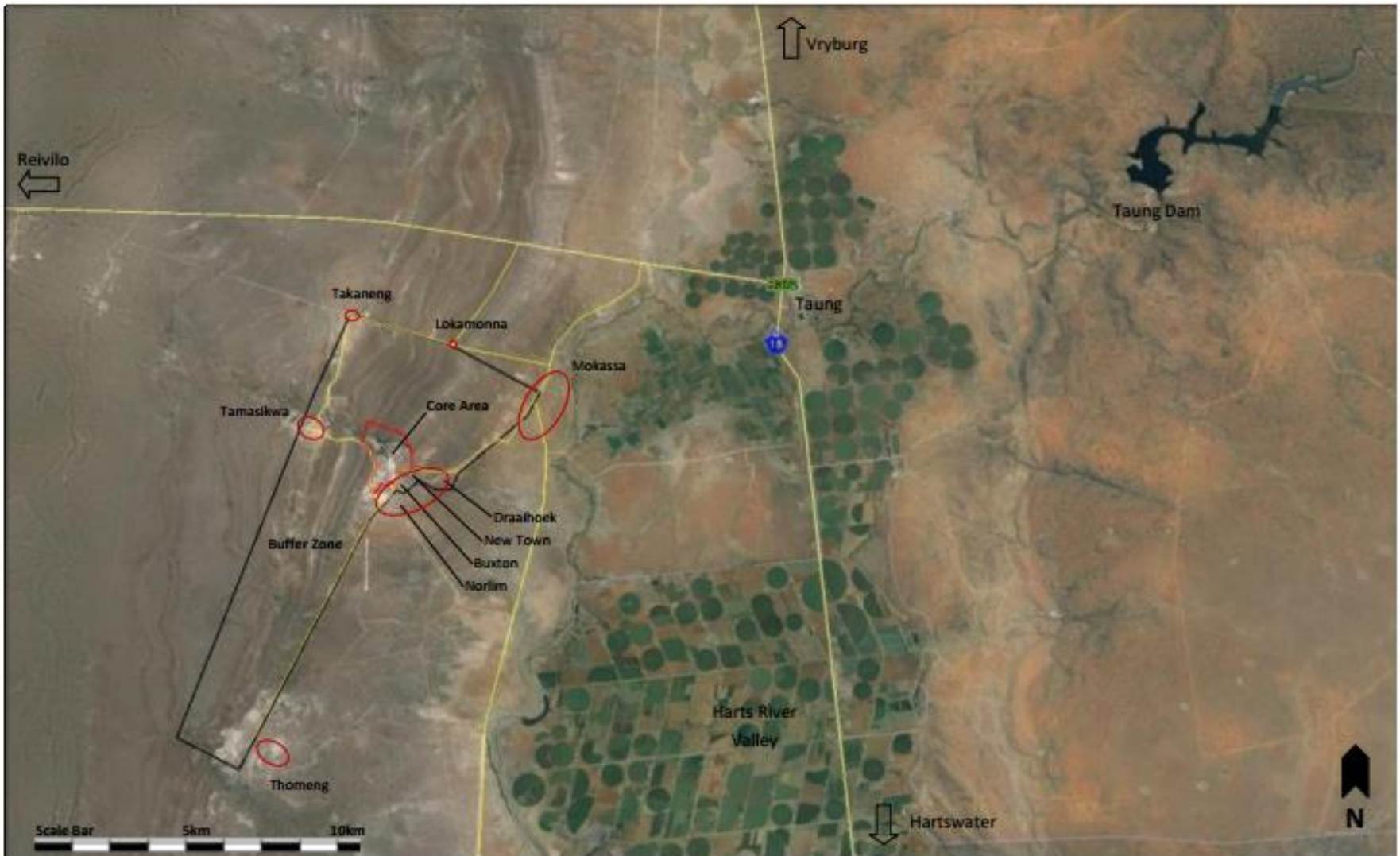


Figure 1: Showing Taung Skull Site and its environs.

Because this proposed development constitutes a linear development exceeding 300m as per Section 38 (1) of the National Heritage Resources Act (Act 25 of 1999), and originates from an existing structure within the buffer zone of a World Heritage Site, MuTingati Environmental Consultants also assessed the impact of the proposed power lines developments (two 22kv power lines) on the attributes that convey Taung Fossil Site's Outstanding Universal Value (OUV). The assessment was guided by ICOMOS guidelines for assessing impact in and around World Heritage properties (World Heritage Convention Act No 49 of 1999), the National Heritage Resources Act of 1999 and ancillary legislations such as the National Environmental Management Act.

The assessment reached the following conclusions:

1. The proposed power lines originate from an existing Norlim Substation Station and no new infrastructure will be built at this Substation, besides connecting the newlines.
2. This existing Norlim Substation is already within the buffer zone of the Taung Skull Fossil Site.
3. The two new proposed power lines will run along the existing bigger 66kv power line, away from the site but into the historic Buxton area, in whose houses the electrification scheme is meant to serve.
4. There are three visible but isolated lithics in the general area of the development but because of lack of context, the significance is considered low.
5. The proposed new overhead power lines do have a visual impact some sections of the general area but not necessarily on the Taung Skull Fossil Site itself. However, the underground options must be avoided at all costs because of the potential of damaging buried archaeological and paleontological material in this generally sensitive area.
6. The proposed project may have direct and indirect impacts on the attributes that convey the OUV of Taung Skull Fossil Site but these are anticipated to be very minimal compared to the value enhancing the quality of life of the community whose history and heritage are part of the site's OUV.
7. If implemented, and robustly monitored, the project will enhance the profile of the cultural attributes of Taung Skull Fossil Site.

Recommendations

1. The proposed linear developments should be allowed to proceed with modifications listed below:
2. Given the sensitivity of sub-surface materials (both archaeological and paleontological), only the overhead power lines should be constructed and no underground lines should be attempted, even for the shortest distance.
3. The digging of pylons in the sensitive area (first 2km from Norlim) should be monitored by Eskom Environmental Practitioner and if any archaeological or palaeontological are uncovered work must cease immediately and the project archaeologist and SAHRA must be duly informed.
4. It is also advised that the Archaeology, Palaeontology and Eskom Meteorites Unit is alerted when site work begins.
5. Strict and clear reporting procedures for chance findings must be followed by Eskom and its contractors throughout the whole period of construction.

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5 ABBREVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age (<i>EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.</i>)
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LFC	Late Farming Community
LSA	Late Stone Age
MAA	Mineral Amendment Act, No 103 of 1993
MEC	Member of the Executive Community
MIA	Middle Iron Age
MuTingati E.H.S	MuTingati Environmental, Health and Safety Consultants

MPRDA	Mineral and Petroleum Resources Development Act 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
NID	Notice of Intention to Develop
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
ToR	Terms of Reference

6 DOCUMENT INFORMATION

6.1 Periodisation

Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

6.2 Definitions

Just like periodisation, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorization from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development

A *grave* is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A *site* is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project which

requires authorization of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, a HIA must include recommendations for appropriate mitigation measures for minimizing or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

7. Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. Human burials can occur in unpredictable locations. It should be remembered that archaeological deposits (including graves and paleontological remains) usually occur below the ground level. Should this material be revealed during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA must be notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. MuTingati Environmental assumes no responsibility for compliance with conditions that may be required by the PHRA or SAHRA in terms of this report.

8. Terms of Reference (ToR)

Eskom appointed Trans-Africa Projects (TAP) who then subcontracted MuTingati Environmental & Project to carry out a heritage sensitivity assessment of the Buxton section of the proposed two 22kv power lines that starts from the existing Norlim Substation to Taung and Dikhuting, in Greater Taung Local Municipality, North West Province.

9. Introduction

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky *et al* 2001). This case is true for the Taung area, whose historic Buxton village is located within the buffer zone for the World Heritage Site of Taung Skull Fossil Site, North West Province. This area has been experiencing voltage problems that can only be rectified by erecting two new 22kv power lines. Accordingly, Eskom has proposed two new lines that will originate from the existing Norlim Substation (within the Taung Skull Fossil Site) to Taung and Dikhuting. For minor reticulation power lines such as this, it is often enough to apply for exemption but the present case is different because part of the project lie within the buffer zone of an important world and national heritage site. Thus, when Eskom applied for heritage exemption (SAHRA Case No. 9141), SAHRA recommended that a suitably qualified palaeontologist and archaeologist must examine proposed powerlines before submitting either letter of exemption or a full PIA/HIA. Because construction activities outside the Taung Skull buffer zone are currently on hold to awaiting SAHRA comments Eskom appointed Trans-Africa Projects (TAP) who then subcontracted MuTingati Environmental Consultants to examine the known sensitive area (from the existing Norlim Substation up to about 2km of the powerlines).

The Taung Skull Fossil Site, on whose buffer zone, the proposed project is located, was listed in 2005 as an extension of the Fossil Hominid Sites of Sterkfontein, Swartkrans, Kromdraai and Environs (1998), together with the Makapan Valley Heritage Site (2005). The Fossil sites complete the eight World Heritage site for South Africa. It was at the Taung Skull Fossil Site, where in 1924, the celebrated Taung Skull – a specimen of the species *Australopithecus africanus* – was found. Apart from this, several Stone Age and palaeothological material, some which are as yet undescribed, but covering a staggering 2.2 billion years, were also recovered (BCK 2004). Guided by the World Heritage Convention Act (Act No 49 of 1999); the

National Environmental Protected Areas Act (Act No 57 of 2003), the National Environmental Management Act (Act No 107 of 1998), the National Environmental Management Biodiversity Act (Act No 10 of 2004) and the Physical Planning Act, 1967 (Act No. 88 of 1967), all developments at a site such as this are subjected to environmental impact assessments.

The purpose of this HIA is to assess presence/absence of heritage resources on the development footprint but because the proposed development originates within the buffer zone of a World Heritage Site, the direct, indirect and cumulative impact of the proposed developments (two 22kv powerlines) on the attributes that convey Taung Skull Fossil Site's Outstanding Universal Value (OUV) were also be assessed. In view of that, this HIA was also informed by the ICOMOS Guidelines for Assessing Impact near World Heritage places (ICOMOS 2011). No new infrastructure will be built at the existing Norlim Substation and the new powerlines will run along the existing bigger 66kv powerline for whole stretch of the sensitive area until about 1km before branching north and southwards.

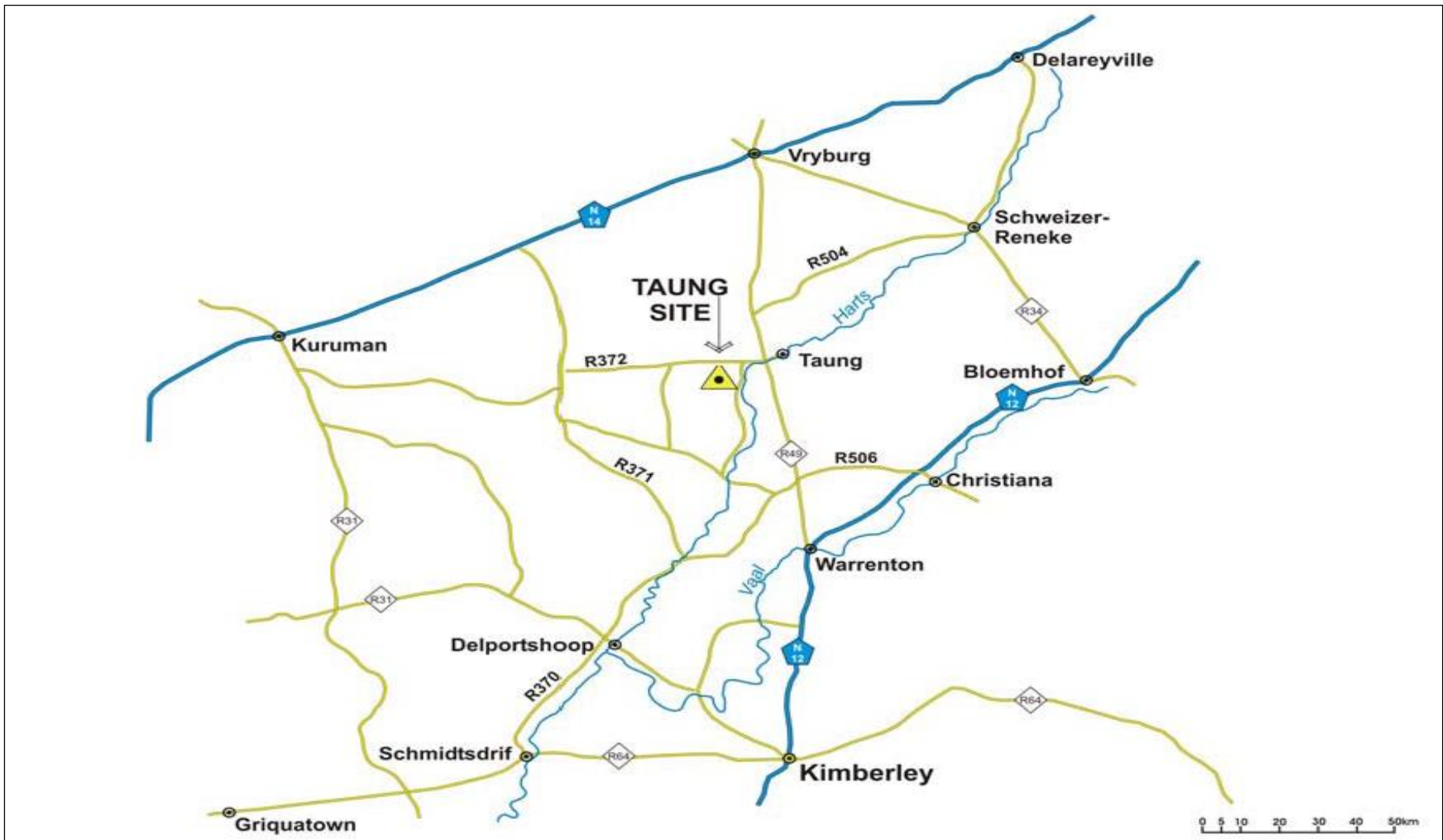


Figure 2: Location of Taung Skull Fossil Site marked by yellow triangle (from BCK 2003)

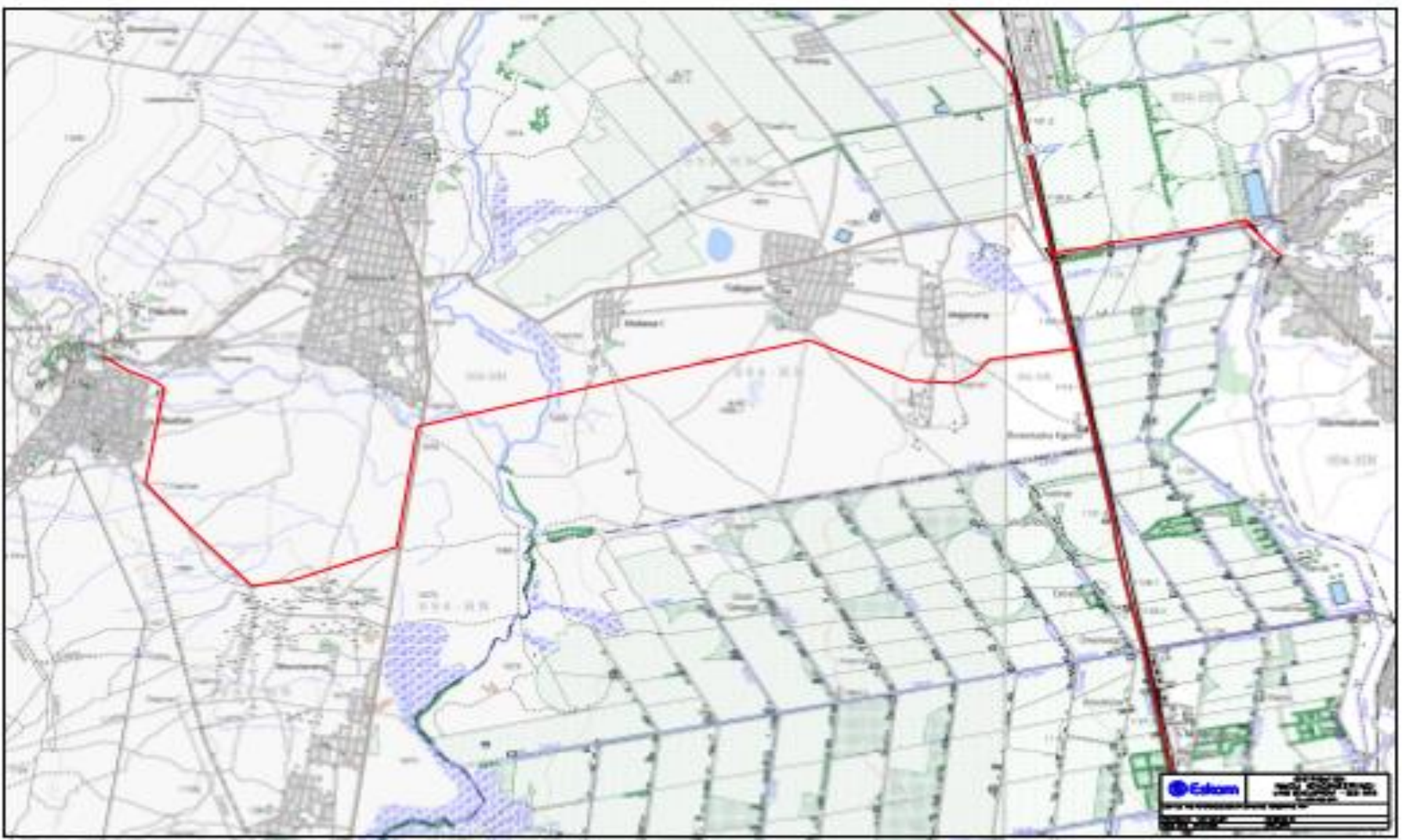
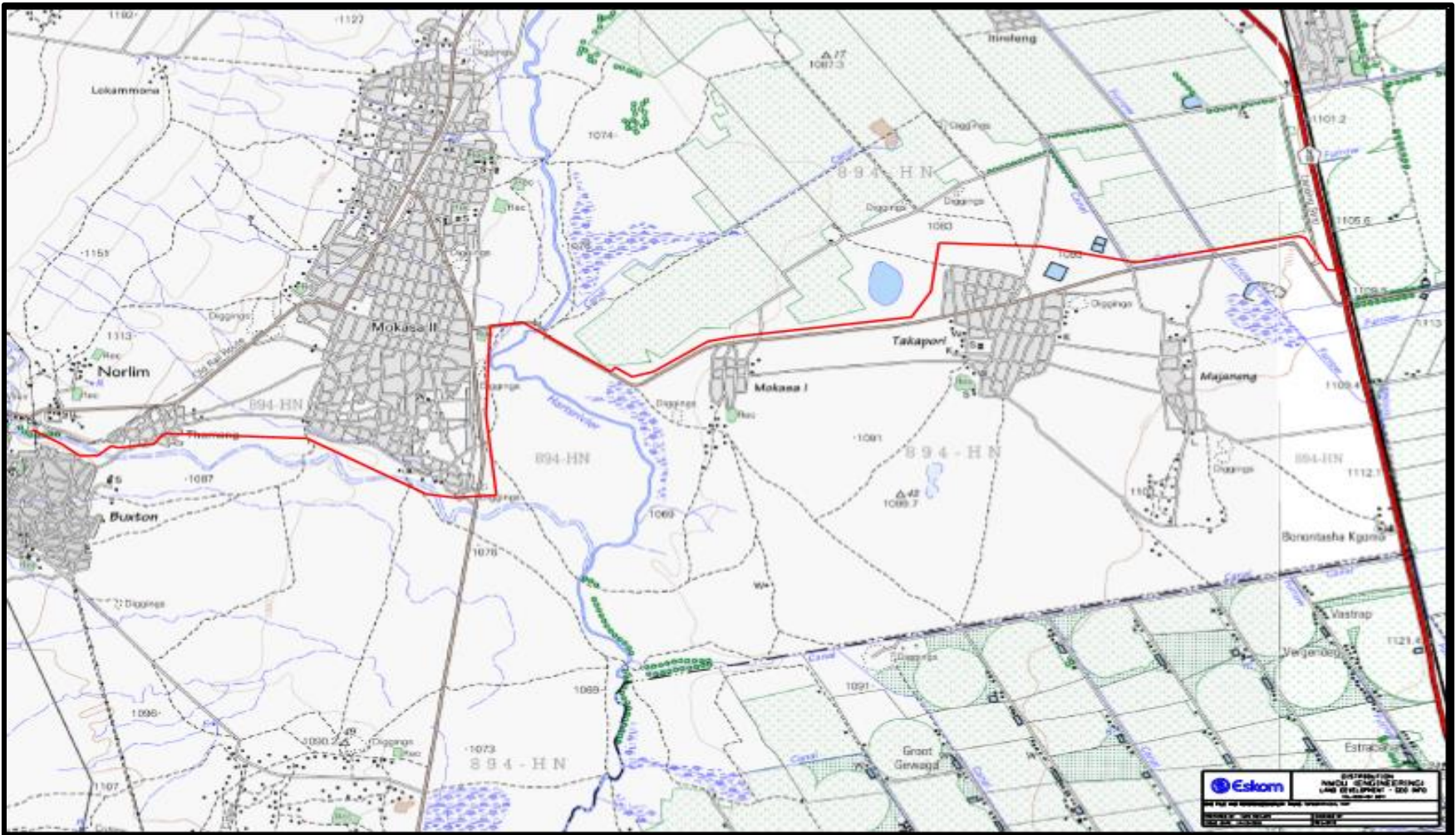


Figure 3: Proposed power line marked red line(Norlim Dikhuting).



Located on the farm Taung 894, just outside the town of Norlim, the core area for the Taung Skull Fossil Site (coordinates S 27° 37' 10" E 24°37' 59") extends for about 158.7429 hectares. A Buffer Zone that includes parts of the residential areas of Buxton and Norlim, was established so that those archaeological sites which fall outside the proposed boundary of the World Heritage Site may also be protected. This buffer zone also serves as an early warning system for preserving the rural ambience and setting of the Taung Skull Fossil Site by preventing undesirable land use which may impact on site integrity. However, as clearly highlighted in the Nomination dossier, "all activities which do not impact on the heritage values of the property will be allowed to continue." The electrification of houses that occur within this buffer zone is certainly beneficial to the local communities, whose quality of life cannot be held in ransom by virtue of them living close to the heritage resources. Nonetheless, this proposed development needs to be preceded by careful study and examination in order to avoid, minimise and or mitigate for the impacts, as approved by the heritage authorities. For the Taung Skull Fossil Site, one cannot afford to be very generous with developments within the buffer zone because the buffer area, though sufficient, is small because of reasons to do with the difficulty in getting permission to include the adjacent property adjacent that falls within the tribal land. Additionally, as a national property, any development that needs to take place within the site or its buffer zone, must obtain the approval of SAHRA and the overall management agent (READ). As listed World Heritage Site, the Taung Skull Fossil Site falls under the jurisdiction of the National Department of Environmental Affairs but the MEC responsible for Environment and Conservation Management in the North-West Province, has been declared as the Management Authority responsible for a period of 5 years from 18 July 2014. It was with this understanding that this study was commissioned.

Because of constant developmental pressures around World Heritage sites, ICOMOS established guidelines for assessing impact in a consistent and robust way (ICOMOS 2011). This standard of best practice is meant to ensure that the integrity of World Heritage properties, their buffer zones or their wider setting is adequately protected. In conformity with this international standard of best practice, this HIA was commissioned to assess the potential direct, indirect and cumulative impact of the two proposed powerlines that originate within the buffer zone of the Taung Skull Fossil Site.

10 Developments in World Heritage properties

Uncontrolled development poses a very strong risk to the integrity of attributes that convey OUV of World Heritage sites. However, controlled development enhances the same attributes and creates employment opportunities resulting in sustainable development especially within the local communities. Within the context of sustainable development, such development must protect the integrity of the World Heritage property, maximise benefits and minimise adverse impacts, respect different value systems and among others considers the interest of various stakeholders (ICOMOS 2011).

10.1 The ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011)

The International Council of Monuments and Sites (ICOMOS) has established guidelines to safeguard cultural heritage threatened by development. According to the ICOMOS guidelines for carrying out impact assessments on listed properties, the statement of OUV is the pedestal on which impacts but professional judgment is required on a case-by-case basis. The ICOMOS Guidelines define direct, indirect and cumulative impacts. Direct impacts are those which result in the total destruction or altering of attributes that convey OUV of a World Heritage property. Indirect impacts are those whose impact is not clearly visible and quantifiable while cumulative impacts refer to the sum of direct and indirect impacts in the short and medium to long term (ICOMOS 2011). This assessment makes use of 2011 ICOMOS guidelines.

10.2 OUV Impact Assessment Methodology

The ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011) sets out a methodology to allow HIA to respond to the needs of World Heritage sites, through considering them as discrete entities and evaluating impact on the attributes of OUV in a systematic and coherent way. Importantly, ICOMOS states that any World Heritage property's OUV is fixed by the World Heritage Committee at the time of inscription and is non-negotiable. Following this methodology, the present study included desk based research, dedicated field evaluations, GIS mapping and plan viewing, spatial rendering, interviews with stakeholders and peer review.

The literature search indicated that while international best practice is vital, ultimately, it is the local situation and local history that is important in determining risk profile, potential benefits to conservation and other potential impacts of any proposed development on heritage (UNESCO *et al.* 2011). The rest of the methodology is explained in the sections below.

11 Data sources

Desktop studies

Relevant published and unpublished sources were consulted in generating desktop information for this HIA. This included online databases such as the UNESCO website, Google Earth, Google Scholar and SAHRIS. Previous HIA in the same area and the Integrated Management Plan of this site, were also consulted. A number of published works on the archaeology, history and palaeontology of the Taung Skull Fossil Site and its associated hominid sites were covered. This included dedicated archaeological, paleontological and geological works by (Breutz 1956; 1968; 1987; Button 1971; Clarck 1971; Eriksson et al. 1975; Bertrand and Eriksson 1977; Humphreys 1978; Humphreys and Thackeray 1983; Beaumont and Vogel 1984; Beaumont and Morris 1990; Beaumont 1999; Holmgren et al. 1999; Johnson et al. 1997; Peabody 1954; Shillington 1985; Wills 1992; Young 1934; 1940). Thus, the proposed development by Eskom was considered in relation to the broader landscape, with a key requirement of the ICOMOS Guidelines.

Field Surveys

In order to fully assess the impact of the proposed development of the Taung Skull Fossil Site and any other associated sites on the development footprint, field survey were required. This took the form of drive-through and actual field walking conducted on the 16th of March 2017. To record observations, a data capture sheet with ICOMOs Assessment Criteria was developed and photographs (Figure 3A-J), as well as GPS coordinates (using a hand-held Garmin GPS device) were also taken.



Figure 5: view of Norlim Substation where the proposed power lines will T-off from



Figure 6: View of Norlim Substation and power line route running along existing power line servitude



Figure 7: Main road running along the boundary of Taung Skull site



Figure 8: Some of existing infrastructure along the proposed power line routes



Figure 9: View pipeline route cutting through grazing land.



Figure 10: Powerline route will cutting through open grazing land with no features to absorb the visual impact but bigger powerlines already dominate the landscape.



Figure 11: View power line route along existing power line servitude



Figure 12: View of the 66kv powerline running along the boundary fence of the existing powerline.



Figure 13: Existing 66kv powerline. The Norlin-Dikhuting proposed powerline will run parallel to this.



Figure 14: 3G: Existing 22kv powerline running near the site boundary.



Figure 15: Existing 22kv powerline running near the site boundary.



Figure 16: Some of the remaining houses to be electrified are located about 300m from the site boundary.



Figure 17: 66kv powerline running close to the site boundary



Figure 18: Existing village road in the project area



Figure 19: View of some roads which characterised the project area



Figure 20: View of powerline route along existing 132kv line



Figure 21: View of some residential developments in the project area



Figure 22: View of residential developments in the project area



Figure 23: View of powerline route along village road

12 Legal framework for the protection of the Taung Skull World Heritage Site

In addition to already existing national legislation, the inscription of Taung Skull Fossil Site as part of the serial nomination for the Fossil and Hominid Sites of South Africa means that the site is now managed in accordance with the World Heritage Convention of November 1972 and the South African World Heritage Convention Act 49 of 1999.

12.1 The World Heritage Convention, 1972

The World Heritage Convention of 1972 was ratified by South Africa in 1997, making it one of the 186 signatories to the Convention. The convention, read along with the Implementation Guidelines for the World Heritage Convention¹, serves to place several duties on South Africa as a signatory to the convention. In Augusts States Parties to the World Heritage Convention, have the responsibility to (Art 6(1) of the WHC) to:

(a)	<i>ensure the identification, nomination, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage found within their territory, and give help in these tasks to other States Parties that request it; (Art 4 and Art 6(2) of the WHC)</i>
(b)	<i>adopt general policies to give the heritage a function in the life of the community; (Art 5 of the WHC)</i>
(c)	<i>integrate heritage protection into comprehensive planning programmes;</i>
(d)	<i>establish services for the protection, conservation and presentation of the heritage;</i>
(e)	<i>develop scientific and technical studies to identify actions that would counteract the dangers that threaten the heritage;</i>
(f)	<i>take appropriate legal, scientific, technical, administrative and financial measures to protect the heritage;</i>
(g)	<i>foster the establishment or development of national or regional centres for training in the protection, conservation and presentation of the heritage and encourage scientific research in these fields;</i>
(h)	<i>not take any deliberate measures that directly or indirectly damage their heritage or that of another State Party to the Convention;(Art 6(3) of the WHC)</i>
(i)	<i>submit to the World Heritage Committee an inventory of properties suitable for inscription on the World Heritage List (referred to as a Tentative List); (Art 11(1) of the WHC)</i>
(m)	<i>use educational and information programmes to strengthen appreciation and respect by their peoples of the cultural and natural heritage defined in Articles 1 and 2 of the Convention, and to keep the public informed of the dangers threatening this heritage;(Art 27 of the WHC)</i>
(n)	<i>provide information to the World Heritage Committee on the implementation of the World Heritage Convention and state of conservation of properties; (Art 29 of the WHC)</i>

The WHCA serves as the main vehicle with which the country can give effect to the establishment of World Heritage Sites. The WHCA makes provisions for the establishment of Management Authorities (MA) through the workings of chapter II, and more specifically section 9 of the WHCA. However, the WHCA should be read and applied in conjunction with all other applicable statutes such as the NEMA, NEMPAA and NHRA because it is a parallel regulatory instrument that is not intended to override or replace existing legislation, but to rather complement the existing regulatory framework.

12.2: South African National Legislations

Relevant pieces of legislations are to the present study are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act 28 of 2002, and the National Environmental Management Act (NEMA), an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The present proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, **power line**, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
 - Exceeding 5000 sq. m
 - Involving three or more existing erven or subdivisions
 - Involving three or more erven or divisions that have been consolidated within past five years
 - Rezoning of site exceeding 10 000 sq. m
 - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus, any person undertaking any development in the above categories, 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. Section 38 (2) (a) of the NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to SAHRA or PHRA (the relevant PHRA), who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or 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. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the unlikely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this does not apply to this study because none exist.

In addition, the new EIA Regulations (08 December 2014) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the developer (Eskom in this case), the environmental consultant, SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Table 1: Evaluation of the proposed development as guided by the criteria in NHRA, MPRDA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, 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	No
	Development exceeding 5000 sq. m	No
	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 sq. m	No
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	No
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Taung Skull Fossil Site
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (08/12/2014) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	Yes

13 The Taung Skull Fossil Site: Description and History

The Taung Skull Fossil Site is situated within a vast abandoned limestone quarry (the Buxton Limeworks) excavated into a series of ancient tufa deposits which have formed along the flank of the Ghaap Escarpment, just west of the Harts River, 17 km south west the town of Taung in the North West Province of South Africa. The famous Taung Skull, Type Specimen of the Genus and Species *Australopithecus africanus*, was blasted by Limeworkers from a pink stony breccia fissure filling in the oldest of the tufa deposits, the Thabaseek Tufa, in 1924. The site boundary includes the entire Buxton Limeworks area (with the associated lime-burning kilns, industrial buildings and mine compound) because there remain numerous other fossiliferous deposits, some of them as yet unexplored, within the fenced area defining the quarry. This has a rather complex outline, necessitating co-ordinates for over 40 survey points.

The first recorded discovery of fossilised bones (small monkey or baboon skulls) at the Taung Skull Fossil Site was in 1919 (Haughton 1925: 68). Then, in November 1924, M. de Bruyn, a quarry man employed at the Buxton Limeworks blasted out of one of the pinkish “impure limestone” deposits a petrified skull and associated endocranial cast, which seemed to him to be much larger than those of the fossil baboons, of which he had previously recovered a number. The specimen along with additional fossil baboon skulls, were collected and sent to Professor Raymond. A. Dart, professor of Anatomy at the University of the Witwatersrand by R.B. Young, (professor of Geology at the same university) who had visited the Taung quarry as a consultant to the Northern Lime Company. The large endocast and skull fragments embedded in the pinkish breccia proved to be part of the new hominid type *Australopithecus africanus*, which means “the southern ape of Africa”. He asserted that the Taung child (the fossil sported a full set of milk teeth) was an ape-like higher primate with rudimentary human-like anatomical features. It therefore filled the role of a “missing link”. It was sheer lucky that the only ape-man or hominid fossil to be found from this quarry found its way into the hands of Professor Raymond Dart, who was perhaps one of only two or three people in the whole of South Africa at that time, who were able to appreciate and give expression to its uniqueness. The universal significance of the Taung Skull Fossil site is vested primarily in this single unique specimen but the area also hosts other important archaeological material.

The broader Taung Skull Fossil Site landscape is characterised by the following archaeological and paleontological heritage resources:

- **The mode of origin and development of the Valley of the Harts River**- its bed is many metres below that of the nearby Vaal River, thus allowing gravity fed transfer of water from the latter river to irrigate the Harts Valley.
- **The various tufa deposits**, particularly the still largely intact and still accreting Blue Pool Tufa. The Blue Pool Tufa's cavitous nature and fossilising leaves preserved in the carbonate-rich waters flowing over the tufa also make interesting discoveries, yet to be fully explored. The still actively accreting portion of the Blue Pool Tufa provides a modern analogue for tufa formation. The Thabasikwa River (historically known as the Thabaseek River) flowing over the surface of the tufa is still today adding to its mass as well as caving out rock shelters and cavities along its winding course. The tufa accretions of the Buxton limeworks are riddled with fossil sites sampling the Pliocene and Pleistocene fauna.
- **The Underground Cave** – this feature, sometimes also referred to in print as “the underground river”, was exposed during the course of earth-moving operations in the north-western extremity of the Blue Pool Picnic Site.
- **Dart Pinnacle and Hrdlička's Pinnacle** - it is tragic that the site of the original Taung Skull find has been irreplaceably mined away but there remain two pillars (pinnacles) of unexcavated tufa deposit flank the approximate site of the discovery and preserve the original surface of the tufa prior to mining. They also preserve relic sandy and stony breccial deposits - still fossiliferous - which represent cavity infills similar to those that once entombed the Taung skull. They provide a valuable analogue for the discovery site which no longer exists. As such, they should be preserved at all costs.
- **Precambrian fossils**-The Taung Skull Fossil Site has become a world famous site in terms of palaeoanthropology mainly as a result of the discovery of the Taung Skull in late 1924 during quarrying operations at this site. This skull was described by Raymond Dart and assigned to a new species *Australopithecus africanus*. This discovery in addition to other hominid remains found elsewhere in South Africa have indicated that the sub-continent may well have been a significant geographical region in the origin of very early humans. The majority of these early hominid remains occur in a karst environment associated with the Malmani Dolomite of Transvaal and the dolomites of the Griqualand West Supergroup outcropping in the Northern Cape and North West Provinces dated at approximately 2300my. Little research on the Precambrian palaeontology of these sites which contains evidence of some of the earliest forms of life (stromatolites and microfossils) positively identified and palaeo-environmental conditions which were a major catalyst to the initiation

of an oxygenic environment (atmosphere) which allowed for the later diversification of life forms and the establishment of life on land.

- **Palynology** - Most layers in the Taung limestone accumulations were not productive but a rare pocket of sediment from Equus Cave did contain fossil pollen grains that give extremely valuable information about long-term environmental change. Potentially similar undiscovered pockets with pollen bearing inclusions might exist in the heritage area that can in future help to elucidate the long environmental history at the site.
- **Early Stone Age occurrences - “ACHEULIAN HOLE”**: About 150 m northeast of Black Earth Cave.
- **Middle Stone Age occurrences - WITKRANS CAVE**: On escarpment, about 5 km south of Buxton. A small (~2 x 8m) collapsed cave, the floor of which was largely excavated by Peabody (1954) in 1947/8. Calcified Layer C there yielded a largish faunal assemblage and MSA lithics comparable to Middle Pietersburg material from the Cave of Hearths (Clark 1971). Of heritage significance because that stratum also yielded 2 or 3 as yet undescribed human molars, presumably *Homo sapiens* (Clark 1971; Sampson 1974). These have a minimum age of ~89 kyr ago in terms of a U-series date on overlying travertine on the upslope side of the site (Beaumont *et al.* 1992).

NORLIM 2: “Visitor’s House” small collection of MSA artifacts within vicinity. ~400 m east-southeast of Powerhouse Cave.

- **Later Stone Age occurrences - NORLIM 1**: In a gully ~100 m north of the road and ~200 m due east of Powerhouse Cave. A fairly extensive and rich LSA [variant of the Kuruman (Oakhurst) Industry] workshop artefact assemblage from a surface collection (MMK 6501) and a small excavation (MMK 6500). This area is part of an eastern buffer zone.

LITTLE WITKRANS SHELTER: A small (4 x 13m) overhang at the base of a low Tufa cliff about 200 m north of Witkrans Cave Peabody (1954). The unstratified up to 0.8 m deep deposit probed by the latter dig yielded some fauna plus an abundance of lithic and organic artefacts ascribable to the Wilton (~8.5 - 1.8 kyr BP) and to Ceramic LSA from 1.8 - historical times (Humphreys and Thackeray 1983; Beaumont & Morris 1990).

POWERHOUSE CAVE: A “bilobial” cave, ~10 x 15 m in extent, in Norlim Tufa, on the east wall of Thabasikwa gorge. The latter investigation revealed that the up to 0.6 m deep deposit contained a fair density of fauna (including fish) and Wilton material dated to

between 3.7 and ~2.0 kyr BP. Also present were paintings in the form of red smudges, finger lines and one “asterisk” (Peabody 1954; Humphreys 1978).

TOBIA’S CAVE: Mining operations in “Quarry C’ exposed an unconsolidated cave deposit in which a small partly-mineralised pentagonoid skull (parietals and much of frontal) of San type was found, leading to a visit by Tobias in 1952 located west south-west of Blue Pool. He retrieved further human fragments (teeth), many large mammal bones and a LSA lithic sample from the blasting debris, while excavation into the deposit produced further human and animal bones plus LSA material similar to that from Powerhouse Cave (Peabody 1954; Humphreys 1978).

NORLIM 5: On the hill crest ~200 m east north-east of Equus Cave. A mapped ~60 x 80 m area covered by a dozen or so low rubble covered stone walls, mainly in the form of arcs and semi-circles, lacking a clear overall layout, of the sort noted elsewhere in this region (Breutz 1956; 1968; Beaumont and Vogel 1984). Excavations in 1982 (MMK 6604 - 8) produced amorphous associated Ceramic LSA assemblages and faunal remains that include a possible cow tooth, all dated to 390 - 400 years BP (Beaumont and Morris 1990). Of interest was an area with only ceramics and evidence of ostrich eggshell bead-making, thereby suggesting some degree of activity patterning.

NORLIM 6: On the south slope of the same hill, ~100 m south south-east of Norlim 5. A somewhat larger cluster of the same sort of stone walling that was roughly sketched in 1982 but that still remains to be excavated.

OCHRE CAVE: On the west wall of Thabasikwa R channel, ~250 m south of Powerhouse Cave. A small cave, ~1 m above the river-bed, with a 3m deep rubbly floor deposit. His pits yielded very sparse faunal and LSA assemblages that may relate to finger paintings on its west side that comprise short vertical strips and a grid pattern (Fock and Fock 1989). Both of these patterns are very typical of the parietal art along the Ghaap Escarpment (Beaumont and Morris 1990).

• **Hyaena-Related occurrences - BLACK EARTH CAVE:** ~300 m north north-west of the *A. africanus* cairn. Discontinuous galleries of a cave system in the Norlim Tifa that were largely destroyed by quarrying before 1947, with the most interesting of those recorded by Peabody (1954) being Gallery A, where three successive fossiliferous strata occurred. The lowest of these, with a “mash” of leached bones, was overlain by one with many hyaena

coprolites and a well-preserved fauna, including *E. capensis* (suggesting a pre-Holocene age) and “two types” of *Homo*. Capping that unit was dusty black earth with bones of recent appearance (sheaths on some horn-cores) and complete animal skulls.

EQUUS CAVE: A small (~8 x 20 m) cave, partly destroyed by prior mining, where excavations established an up to 2.5 m depth of sediments, divisible into four strata (1a - 2b) that range from younger than 2.4 to before 27.2 kyr BP (Lee-Thorp and Beaumont 1995; Beaumont 1999). These deposits yielded a vast mammal fauna (over 30 000 identifications) representing 48 species (of which 3 are now extinct), including fragments of *Homo sapiens* (Grine and Klein 1985), that reflect the use of the cave for 30 millennia or more as a brown hyaena maternity den (Klein *et al.* 1991). Sporadic amorphous artefacts in the lower levels were probably flushed in from upslope subsoil sources, together with the sediments which eventually filled the cave to almost roof level (Beaumont 1999). Pollen and 15N isotope analysis (Scott 1987; Johnson *et al.* 1997) show a shift from the present climate and Kalahari Thornveld cover in Stratum 1a to one in Strata 2a and 2b when temperatures were ~4 °C lower and the vegetation a karroid grass land, sustained by rainfall above half of the present ~420 mm per annum (Climate of South Africa 1954).

• **Pre-colonial history to c.1830** - Taung’s first human inhabitants were the Khoi and San peoples. Unfortunately, the evidence for this is scanty but rock engravings do occur (Breutz 1968). Supporting evidence for the imprint of the Khoi and San is found in place names such as the river Thabasikawa (claimed to be a corruption of the original Khoi name !Xabasinqua), the Ghaap limestone plateau or escarpment west of Taung (derived from a Khoikhoi word referring to the succulent *Hoodia pilifera* which was used as an appetite suppressant and arrow poison).

Historical Sotho-Tswana evidence is inferred from the Rolong, who king Tau most certainly gave rise to the Taung. This community was displaced from the Marico (Madikwe) river and moved south of the Molopo river some time before 1700. (Legassick 1968: 115). When Tau was killed in battle at Taung itself, the Rolong disintegrated under the impact of this defeat and divisions that led to their “migration” (much more like changing the location of main town than actual abandoning of the area) further north to the *Setlagoli* district (Molema 1966:4). The resultant “power vacuum” in the Taung district was filled by the Thlaping, with their 19th century capital at Dithakong (Shillington 1985). From 1840 Taung’s history is

associated with the main Thlaping branch under Mahura, who ruled until 1869, and then under Mankurwane who was chief until his death in 1892. The Thlaping were affected by the settlement of whites in and around Taung, and by the impact of diamond discoveries (Shillington 1985: 36-55). In the late 19th century, a D.A. O'Reilly was asked to remove lions from the Taung area, for which he was given a farm, named Thumeng, which later became the site of the present lime works and Taung Skull.

Historical battles and drawing of boundaries in Taung – Several battles were fought between the Sotho-Tswanas and the encroaching Europeans but the notable ones include the June 1882 siege to Taung by about 500-600 white mercenaries against Mankurwane's people who appealed to the Transvaal government. The result was that a boundary was drawn between the Kora and Thlaping, and land was given to the mercenaries. In May 1884 Mankurwane was visited at Taung by Rev. Mackenzie and was quite easily persuaded to accept British protection and by 1885 Bechuanaland was annexed. This led to the removal of the mercenaries by the Warren Expedition in January and the declaration of Bechuanaland a Crown Colony on the 30th of September 1886. In the South African War (1899-1902), Taung was occupied by a small detachment of British Police, to guard the long and vulnerable frontier and railway line between the Orange River and Mafikeng.

Mining history at Taung - Quarrying of lime from the Thumeng tufa began after World War 1 by the Northern Lime Company. The quarry was closed in 1977. A private railway line was opened from Taung to Buxton in 1936. Buxton village was named in 1919, after Earl Sydney Buxton, the Second Governor General of the Union of South Africa from 1914-1920. The man who claimed to be the actual discoverer of the carapaces of limestone tufas at Buxton was Mr M G Nolan, although the Thlaping of the Taung area must long have known this area. His name remained attached to the limeworks at Buxton until 1919, when the Northern Lime Company (previously associated with the Nolan Lime Company following a merger in about 1917) finally took over. In 1967 mining was undertaken under the name of Pretoria Portland Cement (PPC) and worked until the mine closed in 1977.

1.4 Taung Skull Fossil Site's Statement of Outstanding Universal Value

This OUV statement was taken from the World Heritage website, the Nomination Dossier and Government Gazette No 1105 of 10 November 2006. The ICOMOS Guidelines state that the statement of outstanding universal value lies at the core of impact assessment.

As the name suggests, the Taung Skull Fossil Site derives the greater part of its significance from the partial skull and associated endocranial cast of a juvenile ape-man or *Australopithecus africanus*, which was recovered from a cavity within a limestone tufa in the course of commercial mining operations. The discovery and recognition of the significance of the Taung child and the remarkable insights and revolutionary claims of Raymond Dart created not only a new genus and species of hominid, but a series of new fields of scientific endeavour, including African palaeo-anthropology. The discoveries at Taung wrought ground-breaking changes in scientific thought in several scientific fields, and set in motion a chain of events which would lead, ultimately, to the discovery of the important hominid sites of the Sterkfontein Valley in Gauteng as well as the Makapan Valley in the Limpopo Province. Taung, as the type locality of *Australopithecus africanus* - the first place on earth where this species was found - occupies pride of place as the starting point for studies of human evolution on the African continent. The Taung site records an important stage in the emergence and evolution of humans and their close relatives, and as such, it has universal significance. However, the Taung Skull National Heritage Site includes much more than just the site of the skull find itself. It has a fascinating geological and geomorphological history that predates the skull site and contains several deposits that encapsulate evidence of sporadic occupation by emerging man and animals for over three million years. It thus chronicles a broad time spectrum of events from the Precambrian to the present, including sites of palaeontological, archaeological, historical, economic, mining and natural heritage significance. The seminal discovery and recognition of the evolutionary significance of the Taung Skull established Taung as the starting point for the study of palaeoanthropology on the African continent, and re-focused the spotlight from Asia, where early researches had begun, the Africa, where it remains, now established as the undisputed Cradle of Humankind. Associated with and possibly contemporaneous with the fossil skull were found numerous fossilised mammalian, avian and reptilian remains from an extraordinarily broad spectrum of animals, but particularly those of extinct baboons. These have allowed taphonomic interpretations of the mode of accumulation of the tufa fissure deposits to be undertaken, which differ significantly from those interpreted for these sites. The justification for universal value resides in the fact that the Taung Skull Fossil Site has Type Locality status, while the fossil skull itself is the type specimen of the genus and species *Australopithecus africanus*, as well as defining the characters of the subfamily Australopithecinae. Taung is

the southernmost early hominid fossil site, and of the greatest latitude of any hominid fossil site of the Pliocene.

Criterion (iii):

The nominated serial site bears exceptional testimony to some of the most important Australopithecine specimens dating back more than 3.5 million years. This therefore throws light on to the origins and then the evolution of humankind, through the hominisation process.

Criterion (vi):

The serially nominated sites are situated in unique natural settings that have created a suitable environment for the capture and preservation of human and animal remains that have allowed scientists a window into the past. Thus, this site constitutes a vast reserve of scientific data of universal scope and considerable potential, linked to the history of the most ancient periods of humankind.

14 Scope of Assessment

The proposed power lines will not significantly impact the Taung Skull Fossil Site and associated sites because it does not include the building of new structures at the substation (which is closest to the site) and the much smaller 22kv power lines will follow the existing bigger 66kv for the whole extent of the portion within the buffer zone.

The following terms of reference were used to assess impact using ICOMOS Guidelines:

- Identify heritage resources that make up the Taung Skull Fossil Site's cultural landscape and its statement of OUV.
- Assess the potential impact (both positive and negative as well as short and long term) of the proposed changes and its associated activities on the Statement of OUV for site. Potential impact at all stages of the lifespan of the project must be clearly indicated.
- Generate mitigatory measures to enhance or curb the identified impact – this should include short and long term measures (clear indication of which ones are to run throughout the lifespan of the project and its associated activities is critical).
- Compile an HIA report in line with components of heritage that make up the cultural landscape of the Taung Skull Fossil World Heritage Site and its Statement of OUV.
- Make recommendations for beneficiation projects such as research, publications and community heritage projects.

15 Evaluation of Heritage Resources in World Heritage Site

According to ICOMOS, the core documentation in any impact assessment must be the statement of OUV and the identification of attributes that convey OUV individually and collectively. Based on the information from the ICOMOS Guidance and the South African Heritage Resources Agency standards of best practice, data capture forms were used to collect information from the field through condition surveys and observations. After the data was gathered from the field was combined with information from other sources it was deemed essential to assess all forms of impacts. The ICOMOS grading system was combined with that enshrined in the South African National Heritage Resources Act 25 of 1999. The following scale was used to assess significance:

ICOMOS Ranking	South African Legislation (National Heritage Resources Act) Ranking
Very high (World Heritage Sites)	National Heritage Sites (Grade 1)
High (Nationally significant sites)	National Heritage Sites (Grade 1), Grade 2 (Provincial Heritage Sites), burials
Medium (regionally significant sites)	Grade 3a
Low (locally significant sites)	Grade 3b
Negligible	Grade 3c
Unknown	Grade 3a

This scale was combined with data from desktop studies and stakeholder consultations to come up with objective impact evaluation systems.

16 Assessment of Scale of Specific Impact and Change

Positive and negative impacts on heritage resources take many forms: they maybe direct or indirect; cumulative, short term or long term, reversible or irreversible, visual, and physical. For these impacts to be relevant to the HIA study, they must be triggered by the proposed development (ICOMOS 2011).

Direct impacts are those that arise as a primary consequence of the proposed development or change of use. They can result in the physical loss of part or all of an attribute, and/or changes to its setting - the surroundings in which a place is experienced, its local context, embracing present and past relationships to the adjacent landscape (ICOMOS 2011). In the process of identifying direct impacts effort must be invested in considering **cumulative impact** because little impact on a few sites may cause extensive damage on a large scale. By their nature, direct impacts are associated with the development footprint and result in physical

loss such that they constitute a major threat to OUV. Direct impacts resulting in physical loss are usually permanent and irreversible.

Indirect impacts occur as a secondary consequence of construction or operation of the development, and can result in physical loss or changes to the setting of an asset beyond the development footprint.

The scale or severity of impacts or changes can be judged taking into account their direct and indirect effects and whether they are short or long term, reversible or irreversible. The cumulative effect of separate impacts should also be considered. The scale or severity of impact was ranked qualitatively without regard to the value of the asset as follows:

- No change
- Negligible change
- Minor change
- Moderate change
- Major change

NB: Major change refers to change that is irreversible and would result in the loss of physical integrity of the heritage resource (ICOMOS 2011).

The overall impact on an attribute is a function of the importance of the attribute and the scale of change as recorded on data capture forms. Following ICOMOS Guidelines this was summarised for individual attributes using the following nine descriptors from major beneficial on one end of the scale to major adverse on the other with neutral as its centre point.

- Major beneficial
- Moderate beneficial
- Minor beneficial
- Negligible beneficial
- Neutral
- Negligible adverse
- Minor adverse
- Moderate adverse
- Major adverse

NB. Beneficial refers to actions that enhance the value of heritage assets, while adverse refers to actions that result in the erosion of value.

International best practice indicates that every reasonable effort should be made to avoid, eliminate or minimise adverse impacts on attributes that convey OUV and other significant places. Ultimately, however, it may be necessary to balance the public benefit of the proposed change against the harm to the place (ICOMOS 2011; UNESCO et al. 2010). In the case of World Heritage properties this balance is crucial.

17 Evaluation of Overall Impact

The production of themed maps was important in the evaluation of overall impact. Spatial rendering exposed the disposition of attributes; the relationships between the attributes (which may be processes), and the association's attributes have such as visual, historical, religious, communal, aesthetic or evidential. The data captured on the forms was carefully studied to assess the overall impact. In the end, positive and negative as well as direct and indirect impacts of the proposed addition of facilities were measured based on the data collected through the methods outlined.

18 Definition of the Assessment Area

As required by the project brief, the area of the assessment for this project is outside the core area of the Taung Skull Fossil Site but still falling under a small portion of the site's buffer zone and broad cultural landscape (Figure 4).

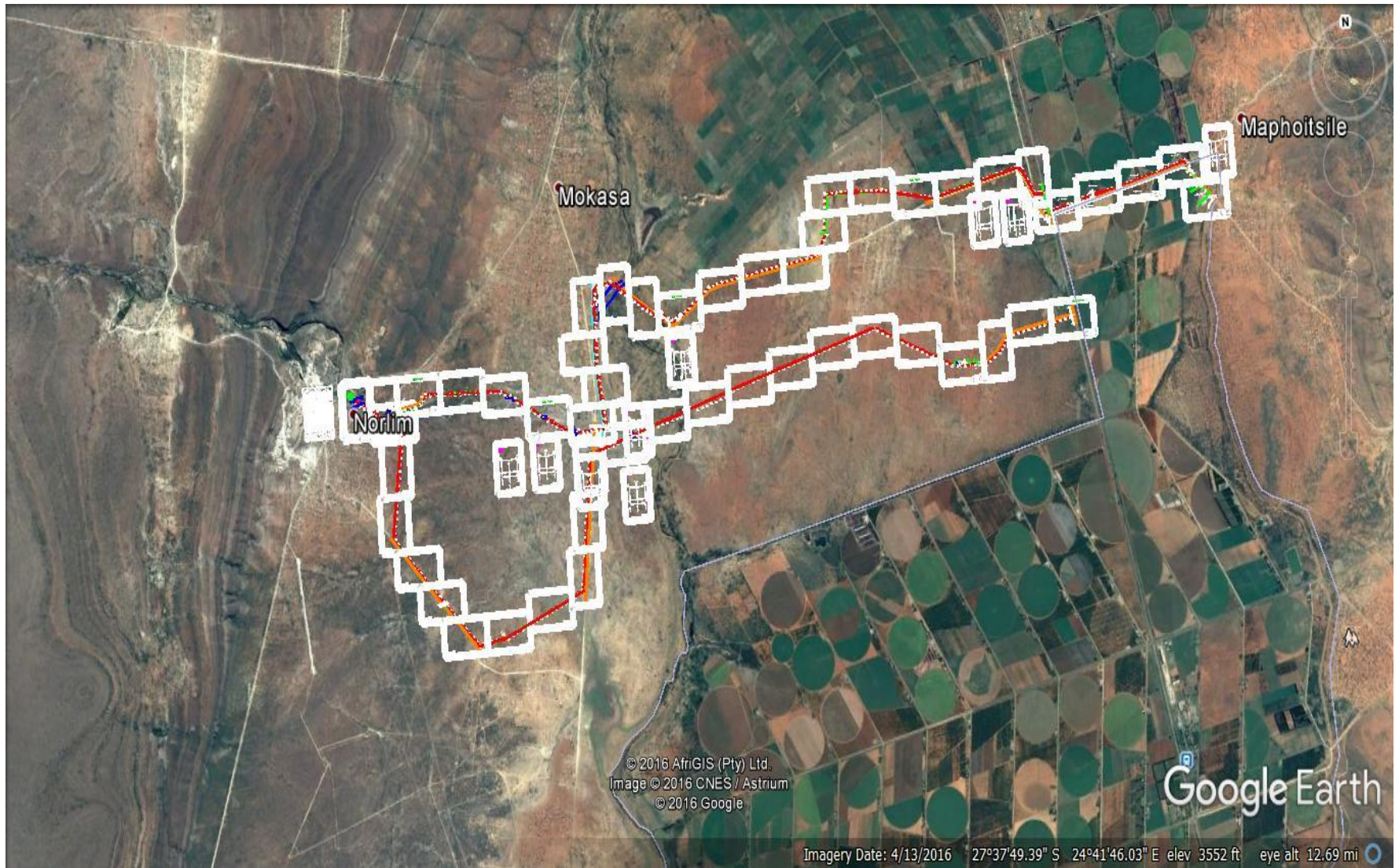


Figure 24: Proposed power lines

19 Description of the Proposed Development

Eskom proposes to add two smaller (22kv) power lines to the existing Norlim Substation that will run to Taung and Dikhuting. The power lines are all overhead. The full project descriptions are attached separately as Annexes).

20 Assessment of the Overall Impact of the Proposed Development

The proposed power lines will enhance the quality of life for the communities around the Taung Skull Fossil World Heritage Site, without compromising (directly or indirectly) the attributes that convey OUV of the site. However, the construction of underground power lines is likely going to impact directly on the cultural material of the sensitive area and must be avoided. Additionally, digging for pylons in buffer zone must be monitored and carefully managed. Most of the cultural and paleontological materials in this area occur below the surface, making the general area very sensitive. With careful supervision, the impact of overhead power lines can be managed and minimised but underground power lines may pose a challenge and therefore should not be considered at all.

21 Impact on the Cultural Setting of the Broader Taung Skull Fossil Cultural Landscape

The fossil cultural landscape is much broader than the listed area and as already acknowledge by the serial nomination of this site, also occur much further afield in different provinces of South Africa. Within the immediate area of the Taung Skull Fossil Site, other forms of heritage also occur and these should not be tempered with. Given the small-scale nature (22kv lines are classified under minor reticulation projects) of the proposed power lines facilities addition, the visual impact is very low together with the negative impact on the sense of place. In fact, the construction these two power lines will enhance service delivery and improve the quality of life of the local communities (immediate users) of this world heritage site. The subsequent completion and construction of other interpretive centres and state-of-the-art museums will also benefit from this improved electrification, thereby enhancing the OUVs of this important site and its associated sites.

22 Impact survey assessment results

Based on the literature and reconnaissance surveys, it was noted that the area under study has a substantial number of archaeological and paleontological sites covering millions of years well. However, surveys on the development foot print only produced three sites with isolated lithic scatters (Figure 26):

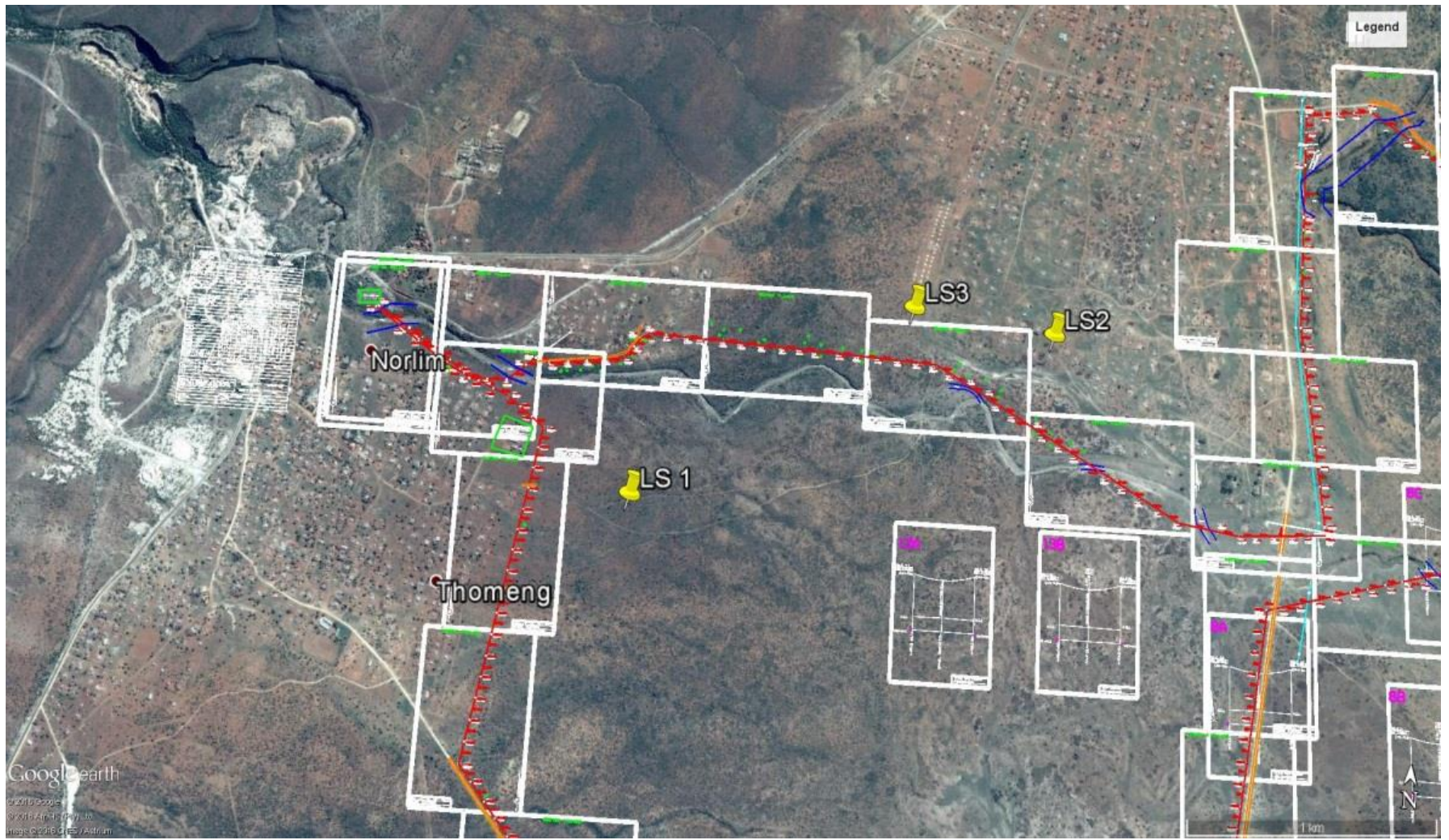


Figure 25: The location of the three Lithic Scatters (LS) reported during surveys.



Figure 26: ESA/MSA lithics reported during surveys. Scale in centimeters.

The lithics consists of unifacial and bifacial points, cleavers, scrapers and blades belong to the ESA and the MSA. Stone tools recorded in the project area and not necessarily along the powerline routes

23 Statement of significance

The general landscape on which the proposed development will be situated is associated with archaeological and paleontological sites associated with numerous values ranging from cultural, scientific, aesthetic and historical. Due to minimal research on other elements, the archaeology and paleontology of some aspects remain unexplored but those related to the Taung Skull itself are now well known. It is this find and its associated contexts that have essential attributes that convey the OUV of the Taung Skull Fossil site, not isolated lithic scatters identified in the present study. Nonetheless, any proposed development on and around the site and its buffer zone must have a low impact. The overhead power lines options of the present study qualify under this banner but the underground power line options do not. Thus, although the proposed

development will ultimately enhance the attributes that convey the value of this site, it must not be implemented carelessly, especially when there is a potential of damaging irreplaceable archaeological and paleontological material. As the discovery of the Taung skull fossil has already shown, sometimes we only have one shot at finding unique discoveries and that chance (no matter how small) must not be risked with underground power lines when there is an option of a safer overhead one. This visual impact of overhead power lines may be negligible when compared to the risk of destroying underground archaeological and paleontological materials that have given this area world heritage recognition.

24 Summary of findings

Table 2: A tabulated summary of the findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None exists within the development footprint itself.
Areas to which oral traditions are attached or which are associated with intangible heritage	Exist not within the scope of the study
Historical settlements and townscapes	Exists and part of the proposed area.
Landscapes and natural features of cultural significance	None exist within the development footprint
Archaeological and paleontological sites	None exist but Taung Skull Fossil Site's buffer zone is within the development footprint
Graves and burial grounds	None exists or are identifiable on the basis of a surface survey
Movable objects	Nine ESA/MSA artefacts
Overall comment	The surveyed area has no identifiable heritage resources on the surface but sub-surface chance finds are still possible.

Because there are no archaeological sites on the development footprint and the heritage materials in the adjacent areas are of low significance, there is no archaeological ground that the proposed overhead power line should not go ahead. However, the underground options for this project should be discarded in favour of the overhead one because the general sub-surface area is very sensitive.

25 Chance findings procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees,

its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- The senior on-site Manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing SAHRA/PHRA.
- If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency exhumation permit may be issued by SAHRA for an archaeologist to exhume the remains.

26 Conclusions

For compliance with South African heritage law and other environmental legislation, Eskom contracted Trans-Africa Projects (TAP) who then subcontracted MuTingati E.H.S to carry out a HIA of the proposed 22kv power lines in Taung. The proposed development does not lie on pristine ground but originates from within the buffer zone of the Taung Skull Fossil Site. Desktop research suggested that the general area is archaeologically and paleontologically rich and but no sites were reported on the development footprint itself, except for three lithic scatters that occur in the general area. The potential for chance finds, still remains and the developer and his contractors are requested to be diligent and observant during construction. The procedure for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA, then there are no archaeological reasons why construction cannot proceed.

Based on this study, the following conclusions and recommendations apply:

1. No archaeological sites of all periods were recovered on the development footprint during the impact assessment of the area proposed for new powerlines.
2. Only the nine ESA/MSA lithics from three scatters were identified during the surveys.
3. No negative direct, indirect or cumulative impacts of the proposed overhead power lines on known heritage sites were noted.

4. Underground power lines have the potential to encounter and harm the physical fabric of archaeological and paleontological remains in this generally sensitive area.
5. Because of the sensitivity of the area within the buffer zone, the Eskom ECO must be vigilant and must report any unfamiliar discovery to the Project Manager who will in turn inform the project archaeologist.
6. The ECO must inform the South African Heritage Resources Agency (SAHRA) and contact the responsible archaeologist and/or palaeontologist, depending on the nature of the find, to assess the importance and rescue them if necessary (with the relevant SAHRA permit). No work may be resumed in this area without the permission from the ECO and SAHRA.
7. The visual impact of overhead 22kv power lines is much less than the already existing 66kv and 33kv power lines in the area and does not have a high negative cumulative impact on the known sites.
8. Though very low on visual impact, the underground power lines must not be implemented because of the potential for encountering and destroying sub-surface sites.
9. There are no archaeological grounds to stop the proposed 22kv overhead power lines
10. It is also advised that the Archaeology, Palaeontology and Meteorites Unit is alerted when construction commences.
11. In the event that any material is discovered during excavation, work should cease immediately and the APM unit duly advised.

27 References

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