

PHASE 1 CULTURAL HERITAGE IMPACT ASSESSMENT REPORT

PROPOSED ESKOM ALOE 132KV SUBSTATION AND LILO POWERLINES POLOKWANE LOCAL MUNICIPALITY CAPRICORN DISTRICT LIMPOPO PROVINCE

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June 2020



Executive Summary

This report addresses the development of the proposed Eskom Aloe 132kv Substation and Lilo Power lines located on the farms Kalkfontein 1001 LS and Majebeskraal 1002 LS, about 18km east of the Polokwane CBD along the R71 to Tzaneen.

- A literature study and pedestrian survey of the project area was undertaken;
- The report identified a number of Late Iron Age and early historical period sites within the buffer zone of the proposed development;
- The positional placement of the proposed infrastructure development, namely, the substation and power lines, will not directly impact on any heritage site.

From a heritage resources management perspective there is no objection towards the proposed development on condition that the recommendations are implemented.

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1. INTRODUCTION AND TERMS OF REFERENCE

1.1 Introduction

The author was contracted by GA Environment to undertake a Phase 1 Heritage Impact Assessment of the proposed Eskom Aloe 132kv Substation and Lilo Power lines. A desktop study and field survey was undertaken for the study.

1.2 Project description and location

The proposed development is located on the farms Kalkfontein 1001 LS and Majebeskraal 1002 LS, about 18km east of the Polokwane CBD along the R71 to Tzaneen within the Polokwane Local Municipality in the Capricorn District. The project consists of a proposed Electrical Substation at coordinates S23° 53.975' E29° 37.363', with an alternative site at coordinates S23° 54.087' E29° 37.396'. From here an overhead 132kv power line will extend southwards for approximately 3.8km where it links up with an existing overhead power line (Figures 1 – 3).

1.3 Terms of reference and scope of work

Undertake a Heritage Impact Assessment and submit a specialist report, which addresses the following:

- A desktop and field assessment to gather information on Heritage resources within the proposed development site;
- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance; and
- Identifying key uncertainties and risks.

1.4 Terrain description

The landscape of the northern part of the proposed terrain is characterized by low granite hills through which the R71 passes. The Nobody Townships' industrial park has been established east of the northernmost hill and north of the R71, where factories have been established. The current ESKOM Aloe Substation already exists here just south of the R71 where a municipal water pipeline also passes through. The hilly area is traversed by at least three power lines. Some type of township development was initiated in the area east of the southbound road leading from the R71, where long strips of land resembling roads were cleared of vegetation. This area covers about 50ha and the proposed substation will be located here.

The original vegetation type is the Pietersburg false grassland but the area is increasingly being pioneered by acacia species due to past and present farming practices. Typical of the hills and outcrops in the Polokwane area, the species *Aloe marlothii* is abundant as they thrive in the ashy soils caused by human occupation. Quartzite outcrops occur in the area.

2. RELEVANT LEGISLATION

Two sets of legislation are relevant for this study with regard to the protection of heritage resources and graves.

2.1 The National Heritage Resources Act (25 of 1999) (NHRA)

This Act established the South African Heritage Resources Agency (SAHRA) and makes provision for the establishment of Provincial Heritage Resources Authorities (PHRA). The Act makes provision for the undertaking of heritage resources impact assessments for various categories of development as determined by Section 38. It also provides for the grading of heritage resources (Section 7) and the implementation of a three-tier level of responsibilities and functions for heritage resources to be undertaken by the State, Provincial authorities and Local authorities, depending on the grade of the Heritage resources (Section 8).

In terms of the National Heritage Resources Act (1999) the following is of relevance in terms of the general protection of heritage resources:

Historical remains

Section 34(1) No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Archaeological remains

Section 35(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority or to the nearest local authority or museum, which must immediately notify such heritage resources authority.

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

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist with the detection or recovery of metals or archaeological material or objects, or use such equipment for the recovery of meteorites.

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

- (a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
- (b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;

- (c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and
- (d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

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

Burial grounds and graves

Subsection 36(3)

- (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-
- (c) 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
- (d) 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 detection or recovery of metals.

Subsection 36(6) Subject to the provision of any 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 content of such grave or, in the absence of such person or community, make any such arrangement as it deems fit.

Culture Resource Management

Subsection 38(1) Subject to the provisions of subsection (7), (8) and (9), any person who intends to undertake a development* ...

must at the very earliest stages of initiating such development notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

***‘development’** means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including-

- (a) construction, alteration, demolition, removal or change of use of a place or a structure at a place;
 - (b) carry out any works on or over or under a place*;
 - (e) any change to the natural or existing condition or topography of land, and
 - (f) any removal or destruction of trees, or removal of vegetation or topsoil;
- *"place means a site, area or region, a building or other structure* ..."
- *"structure means any building, works, device or other facility made by people and which is fixed to the ground ..."

2.2 The Human Tissues Act (65 of 1983)

This Act protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

3. METHODOLOGY

3.1 Sources of information

The main sources of information are a literature review, a pedestrian reconnaissance of the proposed project area and the SAHRIS database. In addition, Google earth and the Topocadastral map 2329 DC was studied.

3.2 Limitations

No serious limitations were experienced with regard to the field survey, although vegetation cover was dense in some places. It must be noted that most archaeological material is subterranean and may have been missed. Chance finds may occur.

3.3 Categories of significance

The significance of heritage sites is ranked into the following categories.

No significance: sites that do not require mitigation.
Low significance: sites, which <i>may</i> require mitigation.
Medium significance: sites, which require mitigation.
High significance: sites, which must not be disturbed at all.

The significance of specifically an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

3.4 Terminology

- Early Stone Age: Predominantly the Oldowan artefacts and Acheulian hand axe industry complex dating to + 1Myr yrs – 250 000 yrs. before present.
- Middle Stone Age: Various lithic industries in SA dating from ± 250 000 yrs. - 22 000 yrs. before present.

Late Stone Age:	The period from ± 22 000-yr. to contact period with either Iron Age farmers or European colonists.
Early Iron Age:	Most of the first millennium AD
Middle Iron Age:	10 th to 13 th centuries AD
Late Iron Age:	14 th century to colonial period. <i>The entire Iron Age represents the spread of Bantu speaking peoples.</i>
Phase 1 assessments:	Scoping surveys to establish the presence of and to evaluate heritage resources in a given area
Phase 2 assessments:	In depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling could be undertaken.
Sensitive:	Often refers to graves and burial sites, as well as ideologically significant sites such as ritual / religious places. <i>Sensitive</i> may also refer to an entire landscape / area known for its significant heritage remains.
NHRA	National Heritage Resources Act (Act 25 of 1999)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

4. BASELINE INFORMATION

Except for the general historical research by Changuion (1986) and Loubser (1994) who researched the Ndebele archaeology of the area, no other significant research was conducted in the project area. The baseline information is therefore generic.

4.1 The Stone Age

The Stone Age covers most of southern Africa and the earliest consist of the Oldowan and Acheul artefacts assemblages. Oldowan tools are regularly referred to as “choppers”. Oldowan artefacts are associated with Homo *habilis*, the first true humans. In South Africa definite occurrences have been found at the sites of Sterkfontein and Swartkrans. Here they are dated to between 1.7 and 2 million years old. Bearing in mind the proximity of the Makapans Valley palaeontological site about 50km south-east of the project area it is possible that they may occur here. This was followed by the Acheulian technology from about 1.4 million years ago which introduced a new level of complexity. The large tools that dominate the Acheulian artefact assemblages range in length from 100 to 200 mm or more. Collectively they are called bifaces because they are normally shaped by flaking on both faces. In plan view, they tend to be pear-shape and are broad relative to their thickness. Most bifaces are pointed and are classified as handaxes, but others have a wide cutting end and are termed cleavers. The Acheulian design persisted for more than a million years and only disappeared about 250 000 years ago. Here, too the Makapans Valley Site is referenced; especially the Cave of Hearths.

The change from Acheulian with their characteristic bifaces, handaxes and cleavers to Middle Stone Age (MSA), which are characterized by flake industries, occurred about 250 000 years ago and ended about 30 000 – 22 000 years ago. For the most part the MSA is associated with modern humans; Homo sapiens. MSA remains are found in open spaces where they are regularly exposed by erosion as well as in caves. Characteristics of the MSA are flake blanks in the 40 – 100 mm size range struck from prepared cores, the striking platforms of the flakes reveal one or more facets, indicating the preparation of the platform before flake removal (the prepared core technique), flakes show dorsal preparation – one or more ridges or arise down the length of the flake – as a result of previous removals from the core, flakes with convergent sides (laterals) and a pointed shape, and flakes with parallel laterals and a rectangular or quadrilateral shape: these can be termed pointed and flake blades respectively. Other flakes in MSA assemblages are irregular in form. The Cave of Hearths in the Makapans Valley Site is referenced.

The change from Middle Stone Age to Later Stone Age (LSA) took place in most parts of southern Africa little more than about 20 000 years ago. It is marked by a series of technological innovations or new tools that, initially at least, were used to do much the same jobs as had been done before, but in a different way. Their introduction was associated with changes in the nature of hunter-gatherer material culture. The innovations associated with the Later Stone Age “package” of tools include rock art – both paintings and engravings, smaller stone tools, so small that the formal tools less than 25mm long are called microliths (sometimes found in the final MSA) and Bows and arrows. Rock art is an important feature of the LSA and is abundant in the Waterberg and the Makgabeng. Rock art has been recorded on the nearby Bakone Malapa Museum and at Moletji, about to the west.

4.2 The Iron Age (Early Farming Communities)

According to the most recent archaeological cultural distribution sequences by Huffman (2007), this area falls within the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

Urewe Tradition:	Kwale branch	Mzonjani facies AD 450 – 750 (Early Iron Age)
	Moloko branch	Icon facies AD 1300 - 1500 (Late Iron Age)
Kalundu Tradition:	Happy Rest sub-branch	Doornkopfacies AD 750 - 1000 (Early Iron Age)
		Eilandfacies AD 1000 – 1300 (Middle Iron Age)
		Klingbeil facies AD 1000 - 1200 (Middle Iron Age)
		Letaba facies AD 1600 - 1840 (Late Iron Age)

The Letaba facies is associated with the Ndebele people of the Polokwane area (Loubser 1994).

Stone walled sites are common in the Polokwane area. Three different types of sites associated with stone walling are found in the area, which Loubser (1994:76) numbered as Group I, II and III sites. Stonewalled sites were normally situated on or close to rocky outcrops, due to the need for stone (Huffman 2007:33). No stonewalling is associated with the Early Iron Age (EIA) and all the stonewalled sites on the Polokwane plateau date to the Late Iron Age (LIA), from the 17th century onwards.

Group I

These sites are situated on prominent hilltops and consist of an array of sporadic walls, forming terraces, surrounding an area of relatively large enclosures in the centre. Walls were constructed of equal-sized granite blocks, or overturned builders forming a single line. Walls were inventively incorporated into the natural topography and they often appear discontinuous from above. Some

terraces were formed by middens heaped up against the rocks, while others were purposefully quarried (Loubser 1994:76). This type of site appears to have been inhabited by Melora Nguni, as similar walling on the saddle of Bambo Hill, at the Bakoni Malapa Museum, is regarded as characteristic of Melora walling (Huffman. pers. comm., 2007).

Group II

This group of sites is located at the base of hills or on gradual rises between valleys, generally facing north. Each site consists of orderly concentric units, with a perimeter wall around a corridor leading to a central enclosure, with smaller ones around it. Walls are mostly of quartzite with granite and milky quartz was also used. Walls comprise two outer faces with stone and rubble infill. Large ashy deposits and dense patches of vegetation are diagnostic of this type of site (Loubser 1994:76).

Similar sites are associated with Kone along the Eastern Plateau. These sites were most likely situated there due to the fact that the area falls in the mist belt and would offer some additional moisture. These sites are named Badfontein sites by Huffman (2007:444) in reference to work conducted by Collett and there are a number of these sites depicted in rock engravings in the Lydenburg area (Maggs 1995:138).

The earliest of the Group II sites, situated along the base of hills, were built in the seventeenth century and were inhabited by Ndebele and Kone people. The first such sites that were built on rises between the valleys date to AD 1838, when chief Mungali and others started to settle in these areas. Most of the Group II sites in the area lasted till 1855 when they were abandoned after the Voortrekkers moved into the area (Loubser 1994:141). These sites, which occur on the gradual rises, are bigger and contain more units than the sites along the hills. It would seem that the population of the area increased, as reflected in the size of the larger settlements. There is also evidence that the sites along the hills were still occupied after the construction of the other sites by incoming groups. This area, as elsewhere in Iron Age Africa, settlement size is linked to the power of the chief, the larger the settlement and the more units, the more powerful the chief or headman (Loubser 1994:142).

Group III

These sites are an imploded and random version of Group II sites, with the perimeter wall being scalloped and linked to a series of central enclosures by straight walls. These sites are found at the base of hills and on rises such as Group II sites. Some, however, have also been located on the top of hills. Walls are similarly constructed to Group II walls, with sparse cultural deposits such as middens (Loubser 1994:76). These Group III sites appear to have been built after 1855 when the Voortrekkers took control of the area. Areas where Group II sites were located were seldom reoccupied, most likely out of reverence for the ancestral spirits. These Group III sites were occupied by minor headman with little real power and the site layout reflects the socio-economic situation of these groups during this time (Loubser 1994:143).

4.3 The historical landscape

Polokwane (Pietersburg) was ultimately established in 1886, although people of European descent occupied the area since 1848 and especially after 1867 with the collapse of Schoemansdal, which was located at the base of the Soutpansberg. By then most of the organised Ndebele chieftainships had relocated away from the Polokwane area to the Mokopane area. From 1867 the general area was subdivided into farms and as the town developed, so did the need for industrialisation and the development of the local mining infrastructure (Changuion 1986).

5. RESULTS OF THE SURVEY

5.1 Palaeontology

The area falls within the green and blue colour code of the SAHRIS Palaeontological Sensitivity Map. A separate palaeontological desktop study and a protocol for finds was prepared for the client.

5.2 Stone Age remains

Recorded feature **12** is a single Earlier Stone Age hand axe, which was recorded in the embankment of the Diep Rivier at coordinates S23° 55.856' E29° 37.761' (Figures 4-5). It is at a depth of approximately 2.5 meters. Middle Stone Age material is abundant in the Polokwane area; however, none were recorded in the project area and neither was any Late Stone Age material observed. The study terrain is not suitable for Rock Art as there are no suitable large loose-standing boulders or rock overhangs which would facilitate rock art.

5.3 Late Iron Age (Early Farming Communities)

As mentioned under Heading 4, BASELINE INFORMATION, Loubser (1994) recorded a large number of stone walled settlements in the Polokwane area, but his study did not extend as far east as this project study. A number of stone walled sites occur along the bases of the hills and in the saddle between the peaks in the buffer zone of the study area (mapped heritage features 1, 2, 4, 5, 6, 7, 8, 9, 10 and 11). These fall into Loubser's Group II and III sites (Figures 6-9). The sites were not definitively differentiated within the scope of this study as that would entail a much more in depth study. However, it should be noted that there is evidence of continuity from Iron Age Farming Community settlements into the historic period, and the division must be understood as largely artificial. For example, recorded features 1, 2 and 4 are most likely Group III walled settlements where the historical continuity and link with descendants is clear in the presence of the cemetery at recorded feature 3.

The Stone walled sites with coordinates are listed below:

Feature 1: S23° 54.312' E29° 37.477'. Probable Group III settlement approximately 100m in diameter.

Feature 2: S23° 54.294' E29° 37.719'. Probable Group III settlement approximately 50m in diameter.

Feature 4: S23° 54.360' E29° 37.650'. Probable Group III settlement approximately 70m in diameter.

Feature 5: S23° 54.310' E29° 37.275' & 23° 54.312'S 29° 37.220'E. Probable Group II settlement approximately 140m in diameter.

Feature 6: S23° 54.158' E29° 37.278'. Probable Group III settlement approximately 75m in diameter.

Feature 7: S23° 54.003' E29° 37.053'. Undetermined and largely disturbed by an ESKOM Substation and municipal water pipeline.

Feature 8: S23° 54.473' E29° 36.770'. Probable Group II settlement approximately 130m in diameter - most of it lays west of buffer zone.

Feature 9: S23° 54.449' E29° 36.813'. Stone walled enclosure linked to some other secondary stone walls and probable historical features.

Feature 10: S23° 54.257' E29° 37.055'. Large stone walled settlement linked to numerous walls in the neck between the hills.

Feature 11: S23° 53.666' E29° 37.355'. Probable Group III settlement approximately 120m in diameter.

The area consisting of recorded features 7, 8, 9 and 10 forms a continuous settlement area at the base and on the saddle of the hills dating from the 17th century up to early historical times.

5.4 Graves and burials sites

5.4.1 An informal cemetery recorded as feature 3 exists at coordinates S23° 54.289' E29° 37.747' (Figures 13-14). It is probably linked to stone walled settlements; feature 2.

5.4.2 Graves have been recorded by Pelsler (2018) just west of the present Aloe Substation at coordinates S23° 53.950' E29° 37.031' (Figure 15).

5.4.3 The stone walled settlements recorded above will all contain obscured human burials.

The graves are regarded as highly significant.

5.5 The built environment

No historical structure that is provisionally protected by Section 34 of the NHRA exists in the study area. Nevertheless, the following structures were recorded:

Feature 13: A weir or dam wall consisting of a 5-lobbed structure at coordinates S23° 56.023' 29° E37.591' (Figure 10).

Feature 14: A modern abandoned farmhouse at coordinates S23° 55.167' E29° 36.936' (Figure 11).

Feature 15: A concrete reservoir and livestock drinking troughs at coordinates S23° 54.773' E29° 37.202' (Figure 12).

None of these structures are significant and will not be impacted by the development.

6. DISCUSSION

The locations of the proposed infrastructure development, namely, the substation and power lines will not directly impact on any heritage site. A number of Late Iron Age and early historical period sites have been observed elsewhere in the buffer zone of the proposed project area. Some of the sites have previously been degraded by ESKOM power lines; the most recent being the Tabor Witkop power line as well as the municipal water pipeline. These sites form a continuous cultural landscape in the Polokwane area that has not been adequately researched. The heritage sensitive areas are indicated on the Google map.

7. EVALUATION AND STATEMENT OF SIGNIFICANCE

7.1 Significance criteria in terms of Section 3(3) of the National Heritage Resources Act.

Table 1: Significance criteria and rating

Significance		Rating
1.	The importance of the cultural heritage in the community or pattern of South Africa's history (Historic and political significance)	Medium (buffer zone)
2.	Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage (Scientific significance).	Low (buffer zone)
3.	Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage (Research/scientific significance)	Medium (buffer zone)
4.	Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects (Scientific significance)	None
5.	Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group (Aesthetic significance)	None
6.	Importance in demonstrating a high degree of creative or technical achievement at a particular period (Scientific significance)	None
7.	Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (Social significance)	Low (buffer zone)
8.	Strong or special association with the life and work of a person, group or organization of importance in the history of South Africa (Historic significance)	None
9.	The significance of the site relating to the history of slavery in South Africa.	None

7.2 **Section 38(3) (c) An assessment of the impact of the development on such heritage resources.**

The development will have an indirect negative impact on the cultural landscape and unfortunately add to the impacts caused by previous developments.

7.3 **Section 38(3) (d) An evaluation of the impact of the development on heritage resources relative to the sustainable economic benefits to be derived from the development.**

This development will draw on the existing electrical distribution network. The sustainable economic benefits most likely outweigh the significance of the heritage resources for local community development.

7.4 **Section 38(3) (e) The results of consultation with the communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources.**

The development will have no direct impact on local communities.

7.5 **Section 38(3)(f) If heritage resources will be adversely affected by the proposed development the consideration of alternatives.**

No heritage resources will directly be impacted.

7.6 Section 38(3)(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

No mitigation measures are recommended other than the avoidance of recorded heritage features.

8. RECOMMENDATIONS

In view of the above it is recommended that;

- All construction work must be limited to the localities detailed in the Google earth KMZ files provided to the heritage consultant;
- The recorded features and the heritage sensitive areas must be avoided during development.

From a heritage resources management perspective, there is no reason why the development may not proceed.

9. REFERENCES

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10. MAPS AND IMAGES (Figures 1 – 15)

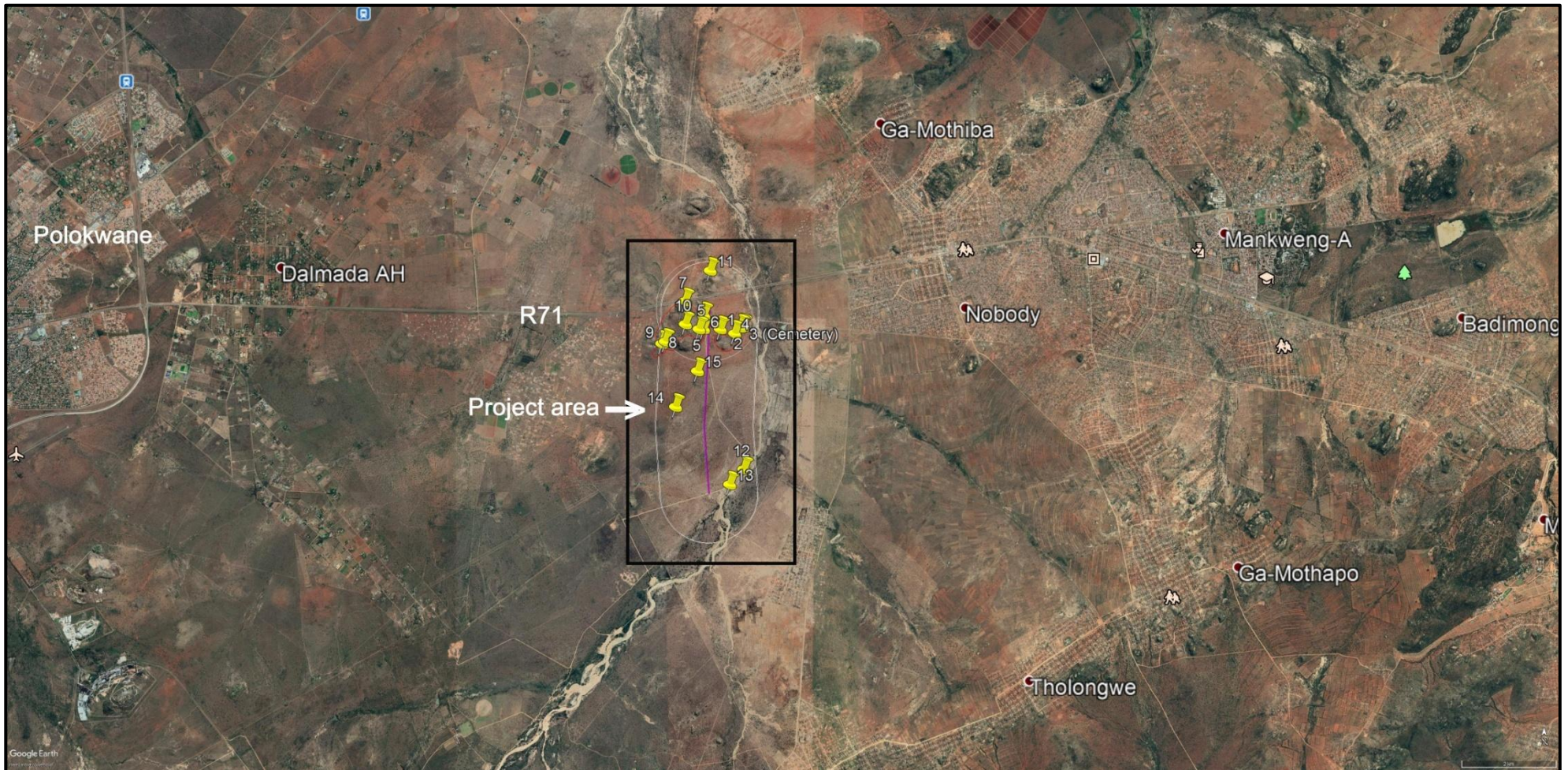


Figure 1. Google image of the project location in relation to Polokwane.

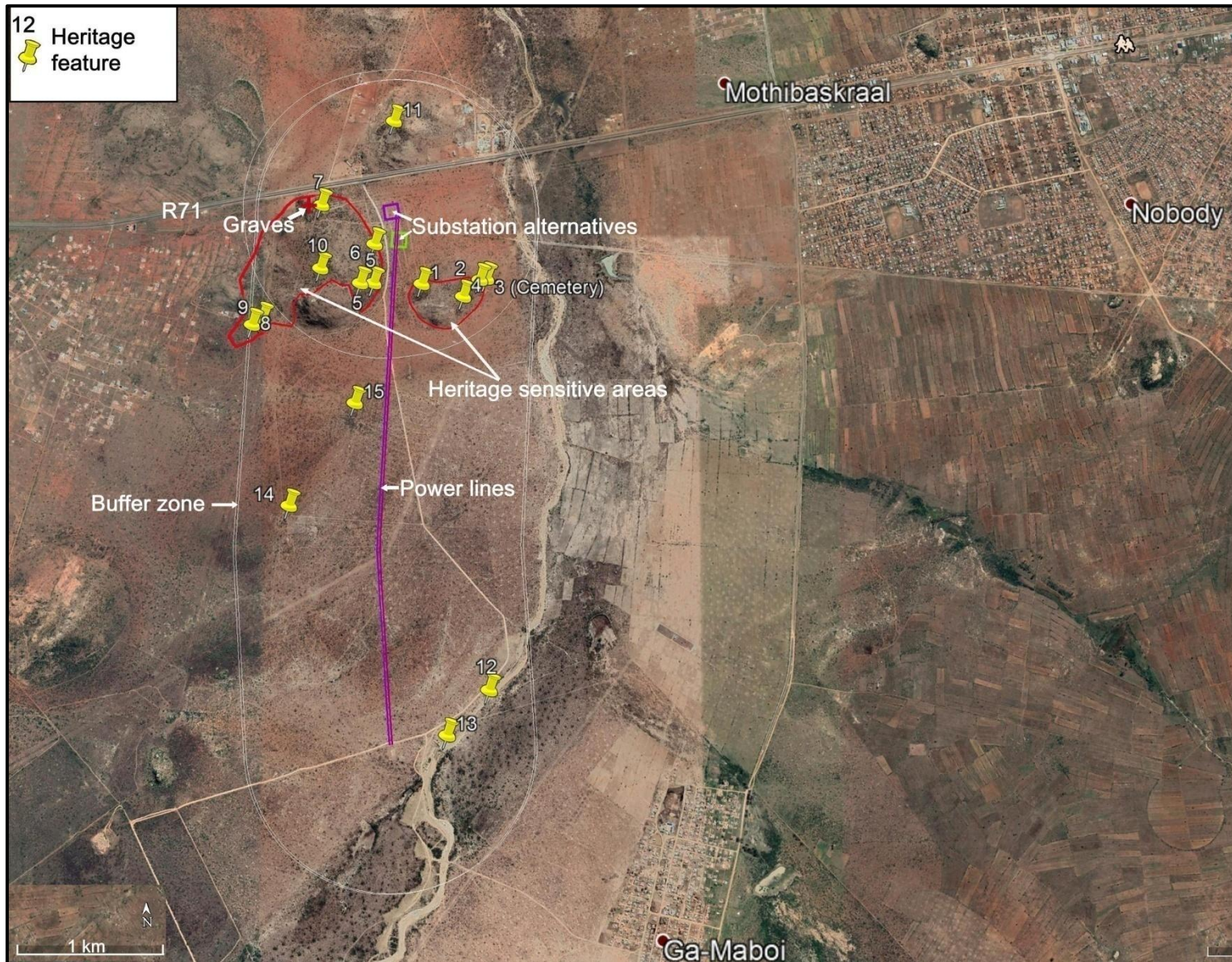


Figure 2. Google earth image of the project location with recorded heritage features.

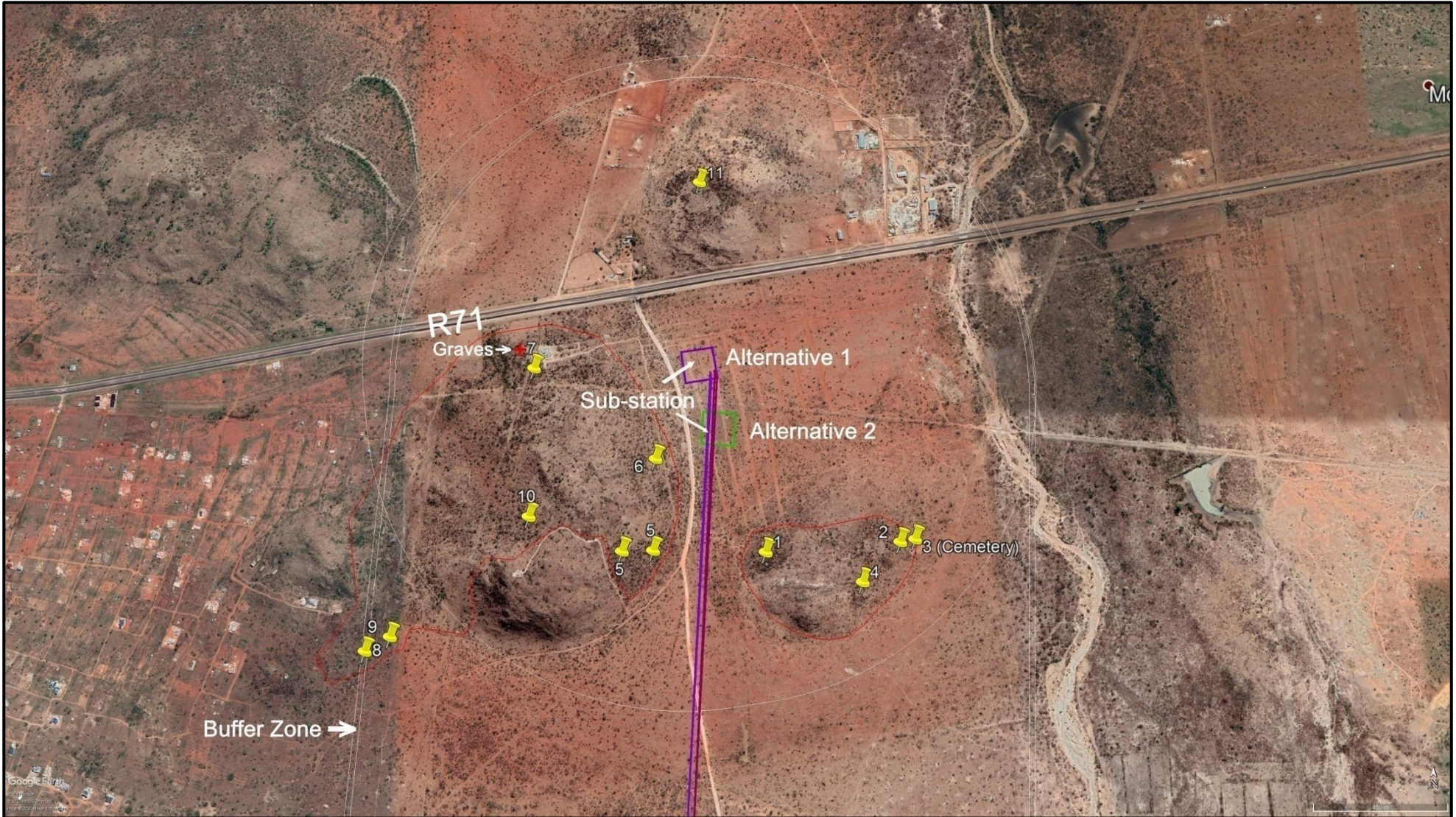


Figure 3. Google earth image of northern area with location of the substation alternatives and power line.



Figure 4. River bank with ESA hand axe protruding.



Figure 5. Full view of ESA hand axe.



Figure 6. View of stone walling at feature 2.



Figure 7. View of stone walling at feature 6.



Figure 8. View of stone walling at feature 7.



Figure 9. View of stone walling at feature 8.



Figure 10. View of weir at feature 13.



Figure 11. View of house at feature 14.



Figure 12. View of reservoir at feature 15.



Figure 13. View of cemetery at feature 3.



Figure 14. View of a single grave at feature 3.



Figure 15. View of graves at near Aloe substation as recorded by Pelsler.

DESKTOP PALAEOLOGICAL HERITAGE IMPACT ASSESSMENT REPORT ON THE FARMS KALKFONTEIN 1001 LS AND MAJEBES KRAAL 1002 LS, LIMPOPO PROVINCE, SOUTH AFRICA.

Background

This study follows a proposal by Eskom to develop a 132KV substation and associated powerlines on the farms Kalkfontein 1001 LS and Majebes Kraal 1002 LS, Limpopo Province, South Africa. The farms are located on the R71 highway, some 25 km east of Polokwane near Mankweng. It falls within the BLUE category of SAHRA's Palaeontological Sensitivity Map, indicating LOW sensitivity, thus no palaeontological studies are required, but a protocol for finds is required.

Regional Geology

The 1:250 000 geological map of Pietersburg (Polokwane) (sheet 2328) shows the farms and surrounding area to be underlain by the Mothiba Formation, the lowest unit of the Pietersburg Group, which is intruded by the Turfloop Granite. An ephemeral drainage system with associated Quaternary fluvial deposits runs through the eastern part of the area.

Pietersburg Group

This consists of a sequence of highly altered volcanoclastic rocks and upper sedimentary unit of the Archaean Pietersburg Greenstone Belt.

Mothiba Formation

In the study area, only the lowermost unit, the Mothiba Formation is present, consisting of highly altered ultramafics with minor amphibolite, quartzite schist and quartz-feldspar porphyry. A Banded Iron Formation is also present in this location but is not laterally extensive.

Turfloop Granite

The Turfloop granite is a light grey to pinkish grey batholith which intrudes the Pietersburg Greenstone Belt. Its composition varies from granodiorite to monzogranite, which suggests that it is likely a composite body of a number of geochemically distinct plutons. Radiometric dating indicates a Neoproterozoic age, between about 2777 and 2674 Ma.

Quaternary Deposits

An ephemeral drainage channel, part of the Limpopo River system runs approximately north south. The channel is prone to flooding and the river bed consists of coarse sand, gravel and sub-rounded clasts of quartz, derived from the surrounding Turfloop granite together with greenstone fragments.

Palaeontological potential

The metamorphosed ultramafics, schist and Banded Iron Formation of the Mothiba Formation, and the Turfloop Granite are unfossiliferous and therefore have no palaeontological potential. There are no reports of any palaeontological finds in the Quaternary cover of this area.

Recommendations

This study does not identify any palaeontological reason to prejudice the progression of the proposed development by Eskom of a substation on the farms Kalkfontein 1001 LS and Majebees Kraal 1002 LS.

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Jones, MG. The geology of the Mt Maré area, Pietersburg Greenstone Belt, South Africa. PhD (Unpul) 298pp, University of London, Imperial College, 1990.

A handwritten signature in cursive script that reads "C. Jones". The signature is written in dark ink and is positioned above a horizontal line.

Specialist:

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29 June 2020

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CHANCE FOSSIL FINDS PROTOCOL: Proposed development of Eskom Aloe 132kv Substation and Lilo Power lines.

Province & region:	Polokwane Local Municipality of Capricorn District, Limpopo Province Farms: Kalkfontein 1001 LS & Mejebeskraal 1002 LS.	
Responsible Heritage Management Authority	SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Phone: +27 (0)21 462 4502. Fax: +27 (0)21 462 4509. Web : www.sahra.org.za	
Rock unit(s)	<ul style="list-style-type: none"> The area is underlain by the Mothiba Formation, the lowest unit of the Pietersburg Group, which is intruded by the Turfloop Granite. An ephemeral drainage system with associated Quaternary fluvial deposits runs through the eastern part of the area 	
Potential fossils	<ul style="list-style-type: none"> The metamorphosed ultramafics, schist and Banded Iron Formation of the Mothiba Formation, and the Turfloop Granite are unfossiliferous and therefore have no palaeontological potential. There is an unlikely possibility of fossiliferous material in isolated quaternary deposits. 	
Environmental officer	<p>1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately, safeguard site with security tape / fence / sand bags for support if necessary.</p>	
	<p>2. Record key data while fossil remains are still in situ:</p> <ul style="list-style-type: none"> Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo / GPS Context – describe position of fossils within stratigraphy (rock layering) and depth below surface Photograph fossil(s) in situ with scale, from different angles, including images showing context (e.g. rock layering) 	
	<p>3. If feasible to leave fossils in situ:</p> <ul style="list-style-type: none"> Alert Heritage Management Authority and project palaeontologist who will advise on any necessary mitigation Ensure fossil site remains safeguarded until clearance is given by the Heritage Management Authority for work to resume 	<p>3. If not feasible to leave fossils in situ (emergency procedure only):</p> <ul style="list-style-type: none"> Carefully remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) Photograph fossils against a plain, level background, with scale Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist

		<ul style="list-style-type: none"> Alert Heritage Management Authority and project palaeontologist who will advise on any necessary mitigation
	<p>4. If required by Heritage Management Authority, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.</p>	
	<p>5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Management Authority</p>	
Specialist palaeontologist	<p>Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Authority. Adhere to best international practice for palaeontological fieldwork and Heritage Management Authority minimum standards.</p>	

Compiled by: Chris Jones. B.ScHons, FGSSA, FLS, Pr.Sci.Nat