HERITAGE IMPACT ASSESSMENT REPORT

PROPOSED FILLING STATION AND CONVENIENCE CENTRE ON THE FARM NEKEL 45MS VHEMBE DISTRICT MUNICIPALITY: LIMPOPO

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EXECUTIVE SUMMARY

The Mapesu Private Game Reserve intends to develop a filling station, small shop, restaurant, etc., as a tourist convenience adjacent to the R572 road on a Portion of the Farm NEKEL 45. The proposed development is located within the buffer zone of the Mapungubwe Cultural Landscape and World Heritage Site. The Mapungubwe Cultural Landscape is represented by the 400 heritage sites in the core (defined by the boundaries of the National Park), and is summarised as *a landscape containing evidence for an important interchange of human values that led to far-reaching cultural and social changes in southern Africa between AD 900 and 1300*. The buffer zone and adjacent areas also host numerous heritage places dating to the Mapungubwe period as well as the Stone Age, other Iron Age sites and historical homesteads and burials.

The heritage survey recorded no heritage sites in the proposed development area. The proposed development will thus have no direct impact on any heritage site. However, infrastructure developments for the purpose of tourism and associated activities such as the proposed development, fences, access roads, power lines, etc., will convey negative visual changes to the cultural landscape, and may indirectly impact on the Outstanding Universal Value and sense of place.

Mapungubwe holds the promise of practical benefits for expanding the tourist industry and the accompanying developmental infrastructure in the Limpopo valley. This is the intention of the proposed development. In the light of this and by comparing existing infrastructure developments in the Mapungubwe National Park, this heritage assessment is of the opinion that the proposed development will only have a negligible impact on the sense of place and Outstanding Universal Value of Mapungubwe.

ABBREVIATIONS

MCL	Mapungubwe Cultural Landscape
MCLWHS	Mapungubwe Cultural Landscape and World Heritage Site
OUV	Outstanding Universal Value
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SanParks	South African National Parks Board

1. INTRODUCTION AND TERMS OF REFERENCE

1.1 Background

The Mapesu Private Game Reserve intends to develop a filling station, small shop, restaurant, etc., as a tourist convenience adjacent to the R572 road on a Portion of the Farm NEKEL 45 (Refer to map, South Africa 1:50 000 2229 BA).

1.2 Project location

The proposed development is located approximately 4km east of the main entrance to the Mapungubwe National Park, south of the R572 and directly opposite the fenced core area of the Park. It is located within the buffer zone of the Mapungubwe Cultural Landscape and World Heritage Site (MCLWHS) (Figures 1 – 2).

1.3 Terms of reference and scope of work

Although the demarcated area is small (2.46ha) the development may impact on the Outstanding Universal Value (OUV) of the MCLWHS. Therefore the Heritage Impact Assessment and specialist report, must address the following:

- A survey of the proposed development footprint;
- Compile an HIA report in which the following is addressed -
  - Assessment of the cultural significance of any identified heritage resources;
  - Assessment of impact on identified heritage resources;
  - Assessment of the impact on the OUV of the MCLWHS;
  - Develop mitigation measures to avoid and / or reduce negative impacts and enhance positive ones;
  - Submission of the HIA report to SAHRA for Statutory Comment.

The scope of work consisted of undertaking a desk top study and field survey to identify possible heritage sites and resources within the proposed development area. Since the proposed development falls within the MCLWHS buffer zone, the criteria for assessment are guided by the undermentioned legislation and guidelines:

- World Heritage Convention and Operational Guidelines, 2012;
- World Heritage Convention Act, 1999 (Act 49 of 1999);
- Guidelines for Assessing Impact near World Heritage Properties (ICOMOS 2011),
- National Heritage Resources Act (Act No. 25 of 1999).
- National Environment Management Act (Act No. 107 of 1998) [NEMA]; and probably the -
- National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003);

1.4 Terrain description

The demarcated terrain is sandy and densely covered with grass and Mopane trees, with grewia sp. and shepherd's trees. The gate and road leading to the farm house runs through the terrain and the boundary fence has a well-travelled gravel road.

2. MAPUNGUBWE NATIONAL PARK AND WORLD HERITAGE SITE

The Mapungubwe Cultural Landscape (MCL) achieved world heritage status in 2003 based on the following criteria:

- ***Criterion (ii)***: The MCL contains evidence for an important interchange of human values that led to far-reaching cultural and social changes in Southern Africa between AD 900 and 1300.

- ***Criterion (iii)*****:** The remains in the MCL are a remarkably complete testimony to the growth and subsequent decline of the Mapungubwe State which at its height was the largest kingdom in the African subcontinent.

- ***Criterion (iv)*****:** The establishment of Mapungubwe as a powerful state, trading through the East African ports with Arabia and India, was a significant stage in the history of the African sub-continent.

- ***Criterion (v)*****:** The remains in the Mapungubwe cultural landscape graphically illustrate the impact of climate change and record the growth and then decline of the Kingdom of Mapungubwe as a clear record of a culture that became vulnerable to irreversible change.

The recognition of these criteria has lead the MCL to be regarded as of OUV as defined by the Operational Guidelines for the Implementation of the World Heritage Convention; 2012, paragraph 49:

> *Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole.*

Another attribute that needs clarification with regard to the MCL is that of "*sense of place*". This is addressed in paragraph 83 of the Operational Guidelines for the Implementation of the World Heritage Convention:

> *Attributes such as spirit and feeling do not lend themselves easily to practical applications of the conditions of authenticity, but nevertheless are important indicators of character and sense of place, for example, in communities maintaining tradition and cultural continuity.*

The MCL is represented by the 400 heritage sites in the core (defined by the boundaries of the National Park), while the buffer zone and adjacent areas also host numerous heritage places dating to the Mapungubwe period as well as the Stone Age, other Iron Age sites and recent homesteads and burials. There is also the natural landscape surrounding the historically occupied places. The whole MCL is an associative landscape. It has intangible values which are as significant as the settlement areas. Furthermore, there are remains of succeeding generations, such as the Khami period, and the ancestral and historical Venda. This entire heritage is associated with the living traditions of the descendent

communities. The MCL therefore is associated with spiritual, scientific, educational, political, economic and social values - the entire landscape must be considered as significant.

3. METHOD

3.1 Sources of information

Literature sources such as academic and heritage assessment reports and published sources are abundant. Surveys of the surrounding farms and core area have mapped heritage resources such as Stone Age and Iron Age sites as well as historical sites. These sources include research conducted by Mr EOM Hanisch (Archaeological Resource Management, Archaeological Department, University of the Witwatersrand), a long-term project called "Origins of Mapungubwe" lead by Prof TN Huffman. SanParks' Environmental Management Framework (EMF) for the Mapungubwe Cultural Landscape World Heritage Site. Additionally, published sources on Rock Art and Stone Age as listed as well as a recent 2017 HIA study for the proposed construction of visitor orientation infrastructure and conservation facilities and hostels for Mapungubwe National Park by Siyathembana Trading edited by Dr's Shadreck Chirikure and Foreman Bandama were consulted

The author undertook a pedestrian survey of the demarcated area for detailed site information, the SAHRIS was consulted and Google earth was used to identify possible archaeological sites on the farm Nekel 45 MS.

3.2 Limitations

The field reconnaissance was thorough and it is unlikely that any significant archaeological sites were overlooked on the demarcated terrain.

3.3 Categories of significance

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

No significance: sites that do not require mitigation.
Low significance: sites that *may* require mitigation.
Medium significance: sites that require mitigation.
High significance: sites that must not be disturbed at all.

The significance of an archaeological site is based on the volume and kind of deposit, the integrity of the context, 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.

> *A crucial aspect in determining the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake.*

There are many aspects that must be taken into consideration when determining significance, such as rarity, national significance, scientific importance, cultural and religious significance, and not least, community preferences.

3.4 Terminology

Early Stone Age: Predominantly the Acheulean hand axe industry complex dating to ± 1 Myr – 250 000 yrs. before present.

Middle Stone Age: Various lithic industries in SA dating from ± 250 000 yrs. - ± 30 000 yrs. before present.

Late Stone Age: The period from ± 30 000 yrs. to contact period with either Iron Age farmers or European colonists.

Early Iron Age: Most of the first millennium AD.

Middle Iron Age: 10th to 13th centuries AD.

Late Iron Age: 14th century to colonial period. *The entire Iron Age represents the spread of Bantu speaking peoples.*

Historical: Mainly cultural remains of the colonial period, as well as structures older than 60 years in terms of Section 34 of the NHRA.

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.

Sensitive: Often refers to graves and burial sites as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

4. BACKGROUND INFORMATION

The study area falls within what is best known as the Mapungubwe Cultural Landscape. Apart from the Mapungubwe related sites, this landscape includes the Stone Age from the Earlier Stone to the Late Stone Age of the San and Khoe groups, as well as heritage resources post-dating the Mapungubwe period. Until recently, up to about 1999, research emphasis was mainly on the core area on the farm Greefswald and to a certain extent the neighbouring farms Samaria and Schroda. The late Mr EOM Hanisch of the University of Venda, formerly from the National Culture History Museum in Pretoria, had also

systematically surveyed areas to the west and south of the Mapungubwe core area. Since 1999, the Archaeological Department of the University of the Witwatersrand engaged in an ongoing long-term project called “Origins of Mapungubwe”, involving extensive surveys, test excavations and postgraduate studies into the ethno-archaeology and archaeology of rainmaking in the Limpopo Basin.

The Stone Age in the Limpopo Valley has been studied under the leadership of Prof Kuman of Wits. Kuman and colleagues (2005) suggested that the earliest occupation of the sites was during the ESA, either in the Acheulean or the post-Acheulean Sangoan Industry. Further, they indicated that the sites bear resemblance to industries that are transitional between the ESA and Middle Stone Age (MSA), especially those found north of the Limpopo in Zimbabwe. Middle Stone Age sites were also studied as part of the project. During the last two millennia the valley was occupied by the San hunter-gathers and Khoe herders/hunter-gatherers who left behind their paintings and implements. Eastwood and Cnoops (1998) addressed the rock art of the Limpopo Basin, while Hall and Smith (2000) attended to the interaction between Hunter-gatherers and farming communities during the first and early second millennia AD.

The first Early Iron Age farmers in this part of the Limpopo valley were of the Kalundu Tradition (the western stream of migration into South Africa); known as Happy Rest, dating to the 5^{th} – 7^{th} centuries AD. From about AD 700 to 900 the climate became colder and drier and no Early Iron Age sites from this period have been recorded in the Shashe-Limpopo basin.

At about AD 900 when the climate improved at the beginning of the Mediaeval Warm Epoch the basin was again settled by the next Early Iron Age inhabitants who belonged to the Zhizo archaeological facies, a ceramic phase of the Nkope Branch of the central stream of migration. The Zhizo capital at Schroda, a central cattle pattern settlement, is the earliest Iron Age site in Southern Africa to yield a substantial amount of ivory objects and imported glass beads. It seems that the Shashe-Limpopo basin, through the Zhizo group, was probably the first area in the interior to be integrated directly with the Indian Ocean trade network.

According to the archaeological record, Schroda lost control of the interior portion of the trade at about AD 1000 to a new group of people known as Leopard’s Kopje. They established their capital at K2 (on the farm Greefswald), also a central cattle pattern settlement, while commoner K2 sites are spread throughout the Basin. K2 produced a great number of ivory objects and an even greater quantity of glass beads showing that the Leopard’s Kopje people had clearly taken over the interior portion of the east coast trade. The people at K2 melted down some of the imported beads in clay moulds and produced large cylindrical beads known as “garden rollers”, which they in turn traded into present day Botswana to where the Zhizo leadership had moved. The wide distribution of the “garden rollers” and limited distribution of other types of beads demonstrates the pivotal role K2 played in the trade network. Recent work by Calabrese at Little Muck indicates that the K2 chiefdom incorporated some Zhizo people who remained in the basin. The Zhizo derived pottery, called Leokwe, shows that they maintained their separate identity.
The great number of trade goods at K2 shows that the trade had enhanced the leader’s status: K2 was two to three times the size of the Zhizo capital at Schroda. The general

population of the basin increased during K2 times. This increase, in combination with the control of the east coast trade, helped to intensify social ranking and contributed to the development of a bureaucratic class and its associated worldview, which manifested itself at Mapungubwe.

At AD 1220 the K2 leader shifted the capital to the flat hill called Mapungubwe about 2 km from K2. Wealth accrued by its leaders, through trade from the Indian Ocean network, resulted in the social organisation changing to a situation in which the ruling elite lived separately from commoners and was physically separated from their followers. At Mapungubwe the leader moved to the hilltop while the majority of his people lived below. This led to the final transformation of the central cattle pattern into the Zimbabwe Pattern. Due to a combination of political and climate change, the people of the kingdom dispersed after AD 1300, with the centre of regional power shifting to Great Zimbabwe, north of the Limpopo River.

It is now known that the Zimbabwe culture evolved in the Shashe-Limpopo basin and that Mapungubwe was the first Zimbabwe capital. Consequently, archaeologists divide the culture into three chronological periods named after the important capitals;

(1) Mapungubwe (AD 1220-1290)
(2) Great Zimbabwe (AD 1290-1450), and
(3) Khami (AD 1450-1820

Mapungubwe is known for its gold objects although it is not clear how gold was first discovered. Presumably Swahili traders recognised alluvial gold in the basin as it washed down the Shashe River and placed a value on it. At the beginning of the trade, gold was probably more of a means to wealth than wealth itself. However, by AD 1220 gold objects had been locally manufactured and Mapungubwe produced unique items such as the golden rhinos, sceptre and bowl that were made from thin gold sheet tacked onto wooden cores. Gold was also produced from reef mining as far as West Nicholson and the Gwanda district of Zimbabwe.

Mapungubwe's power and territorial sovereignty increased and gained control over approximately 30 000 km^2. At its peak in the 13th century, Mapungubwe's own population probably counted between 3 000 and 5 000 people, making it the first urban centre and capital of the first state in Southern Africa.

At the end of the 13th century the climate changed throughout Southern Africa, apparently brought on by the spread of the Little Ice Age, and it became colder and drier in the interior. In some areas it was no longer possible to cultivate traditional grain crops. As a consequence, Mapungubwe was abandoned, the entire basin depopulated and the state disintegrated. Great Zimbabwe became Mapungubwe's economic, cultural and political successor.

Khami sites, dating to after AD 1450, are found in the Basin. Prior to this and shortly after the demise of Mapungubwe, the first Sotho/Tswana people moved into this part of the interior from East Africa. This early facies of the pottery tradition, namely Icon, is named after the farm south-west of Mapungubwe. Icon pottery occurs on Khami sites north of the

Zoutpansberg and similarly Khami pottery occurs on Icon sites south of the Zoutpansberg. Khami and Icon merge to form the Letaba style that is associated with Venda-speaking people today.

Huffman (2007) proposed the under-mentioned cultural sequence for the Mapungubwe Cultural Landscape.

- Zhizo (AD 750-1050)
- Leokwe (AD 1050-1220)
- K2 (AD 1000-1200)
- K2 Transitional (AD 1200-1250)
- Mapungubwe (AD 1250-1300)
- Great Zimbabwe (AD 1300-1700)
- Icon (AD 1300-1500)
- Khami (AD 1400-1820)

Archaeological sites of the Mapungubwe Cultural Landscape have been recorded at Skutwater 115 MS (Van Ewyk: 1987), Bismarck 116 MS (Roodt: 2001), Bergen-Op-Zoom 124 MS, Overvlakte 125 MS and Semple 119 MS (Roodt: 2009) immediately east of the core area.

5. RESULTS OF THE SURVEY

5.1 Palaeontology

The area falls within the yellow colour code of the SAHRIS Palaeontological Sensitivity Map, which means that there is a high probability for fossil finds. A desktop study is required and based on the outcome of the desktop study, a field assessment is likely. The desktop study is attached as **Appendix 1**.

5.2 Stone Age remains

Two out of context crude MSA flakes were noted on the demarcated terrain, but no primary concentration or knapping sites were observed. The demarcated terrain is not suitable for rock art as there are no suitable large loose-standing boulders or rock overhangs. However, I was shown an unrecorded rock art site approximately 1km southwest of the demarcated terrain. This small rock shelter contains two panels with black painted images. This is one of two rock art sites know by staff at Mapesu (Figures 5 – 6).

5.3 Iron Age (Early Farming Communities)

No Iron Age material was observed on the demarcated terrain. However, discussions with Mapesu staff, observations on Google earth and mapped heritage surveys clearly indicated that there are numerous Iron Age and historical contact period sites on Mapesu Private Game Reserve. I visited two of these sites – the first approximately 2km from the proposed development (Figure 7). No diagnostic pottery was seen, but this site has some stone-walling and could be either Khami or Birwa. The other stone-walled site is located

approximately 3.5km south of the development area. A colonial period brass button and hexagonal blue beads was noted. This is probably a Venda site (Figure 8).

5.4 Graves and burials sites

No marked graves or burial sites exist on the demarcated terrain.

5.5 The built environment

The pedestrian survey revealed no evidence of any historical structures in the project area.

6. POTENTIAL IMPACT

The proposed development will have no direct impact on any heritage site. However, infrastructure developments for tourism and associated activities, such as the proposed development, fences, access roads, power lines, etc., will convey negative visual changes to the cultural landscape, and may impact on the OUV and sense of place.

7. DISCUSSION

Mapungubwe holds the promise of practical benefits when expanding the tourist industry and the accompanying developmental infrastructure in the Limpopo valley. This is the intention of the proposed development. The question is; how will it impact on the OUV and sense of place of the MCLWHS?

This question can be answered by comparing existing modifications along the R572. The road itself, fencing and power line has already severely modified the quality of sense of place. Add to this the nearby infrastructure development of the Mapungubwe National Park, such as the main entrance, cultural complex, etc., which remains highly visible despite its sensitive design. Additionally, the access roads, power lines and water pipelines supplying Venetia Mine, and the construction of lodges and dams in and around the MCL also impact on the sense of place, although it is minimal to negligible (Pikirayi et al, 2012). Pikirayi et al (2012) states that some places in a landscape have a deeper sense of place when compared to others. For example, former capitals such as at Mapungubwe Hill may evoke a deeper sense of place than the smaller sites. Thus the concept of sense of place is inextricably linked with significance. This proposed infrastructure development will have a negligible impact on the sense of place of Mapungubwe.

The last consideration is the OUV of the MCLWHS. Bearing in mind that the OUV is being preserved inside the core area of the National Park by protecting its main archaeological sites, namely Schroda, K2 and Mapungubwe Hill, and the unique physical ecological landscape of sandstone formations, this proposed infrastructure development will have a negligible impact on the OUV of Mapungubwe.

The proposed development will assist in promoting the development of the MCLWHS to the benefit of the local economy, resident communities and tourists. From a heritage management perspective there is no objection to the proposed development, on condition

that all structures are sensitive to the values of the Mapungubwe Cultural Landscape and World Heritage Site.

8. SIGNIFICANCE RATING

8.1 Significance criteria and rating

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

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

The development will have no negative impact on specific heritage remains, but will have a negligible impact on the sense of place of the MCLWHS.

8.3 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.

The development will facilitate tourism development in the Limpopo valley.

8.4 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.

Public participation and stakeholder consultation is in progress.

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

There are no alternatives. Since the facilities at Dongola Ranch was closed, there are no other similar facilities between Musina and Pont Drift.

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

Monitoring of deep excavation of fuel tanks for palaeontological chance finds.

9. RECOMMENDATIONS

It is recommended that any physical structure, including signposting, should be treated with sensitivity towards the landscape:

- Not to have a strong visual impact, and
- Be modified to an acceptable height, which will not result in any prominent features on the landscape.

10. REFERENCES

Department of Environmental Affairs and Tourism 2001. Mapungubwe Cultural Landscape, World Heritage Nomination Dossier. RSA.

Edward B Eastwood & Cathelijne Cnoops 1998. *The Rock Art of the Vhembe Game Reserve*. Paleo-Art Field Services. Louis Trichardt.

Henning, D & Beater, J 2014. *Mapungubwe Cultural Landscape World Heritage Site*. Environmental Management Framework. Status Quo Report. Nemai Consulting.

Huffman, T.N 1999. *The Archaeology of Precolonial Farming Societies in the Shashe-Limpopo Basin.* A review report for DeBeers Consolidated Mines Limited. Archaeological Resource Management, Archaeology Department. Wits, Johannesburg.

Huffman, T.N 2007. *Handbook to the Iron Age. The archaeology of Pre-colonial Farming Societies in Southern Africa.* University of KwaZulu-Natal Press.

Huffman, T.N 2011. *Origins of Mapungubwe Project Progress Report*. 2009-2010. Archaeological Resources Management. University of the Witwatersrand.

Huffman, T.N 2012. *Historical archaeology of the Mapungubwe area*: Boer, Birwa, Sotho-Tswana and Machete. Southern African Humanities 24: 33–59. Pietermaritzburg.

Hanisch, E.O.M 1980. An archaeological interpretation of certain Iron Age sites in the Limpopo/Shashi Valley. Unpublished MA dissertation. Pretoria: University of Pretoria.

Le Baron, J.C; Kuman, K; & Grab, S.W 2010. *The landscape distribution of Stone Age artefacts on the Hackthorne plateau, Limpopo River valley, South Africa*. South African Archaeological Bulletin 65: 123-131.

Pikirayi, I; Chirikure, S; Manyanga, M; Mothulatshipi, S; & Ntsoane, O 2012. *Heritage impact assessment report and management plan relating to the establishment of the Vele Colliery near Mapungubwe World Heritage Site, Musina, Limpopo Province: South Africa*. Report prepared for Limpopo Coal Company for submission to the South African Department of Environmental Affairs. Unpublished specialist report.

Simon Hall & Ben Smith 2000. *Empowering Places*: Rock Shelters and Ritual Control in Farmer-Forager Interactions in the Northern Province. *South African Archaeological Society Goodwin Series* 8: 30-46, 2000.

Republic of South Africa 1999. South African Heritage Resources Act (Act 25 of 1999). Pretoria: Government Printer.

Roodt, F 2001. Phase 1 Archaeological Impact Assessment. Proposed Construction of a Dam on the Farm Bismarck. Weipe. Northern Province. Unpublished report.

Roodt, F 2009. Heritage Impact Assessment Report. Proposed Vele Colliery. Weipe, Vhembe District Municipality: Limpopo. Unpublished specialist report.

United Nations Educational, Scientific and Cultural Organisation Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage. World Heritage Centre. WHC. 12/01 July 2012.

Siyathembana Trading 2017. HIA Study for the Proposed Construction of Visitor Orientation Infrastructure and Conservation and Accommodation Facilities, Mapungubwe Cultural Landscape World Heritage Site. Unpublished specialist report.

Van Ewyk, J.F 1987. The Prehistory of an Iron Age site on Skutwater. Unpublished MA thesis. Pretoria: University of Pretoria.

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11. MAPS AND IMAGES

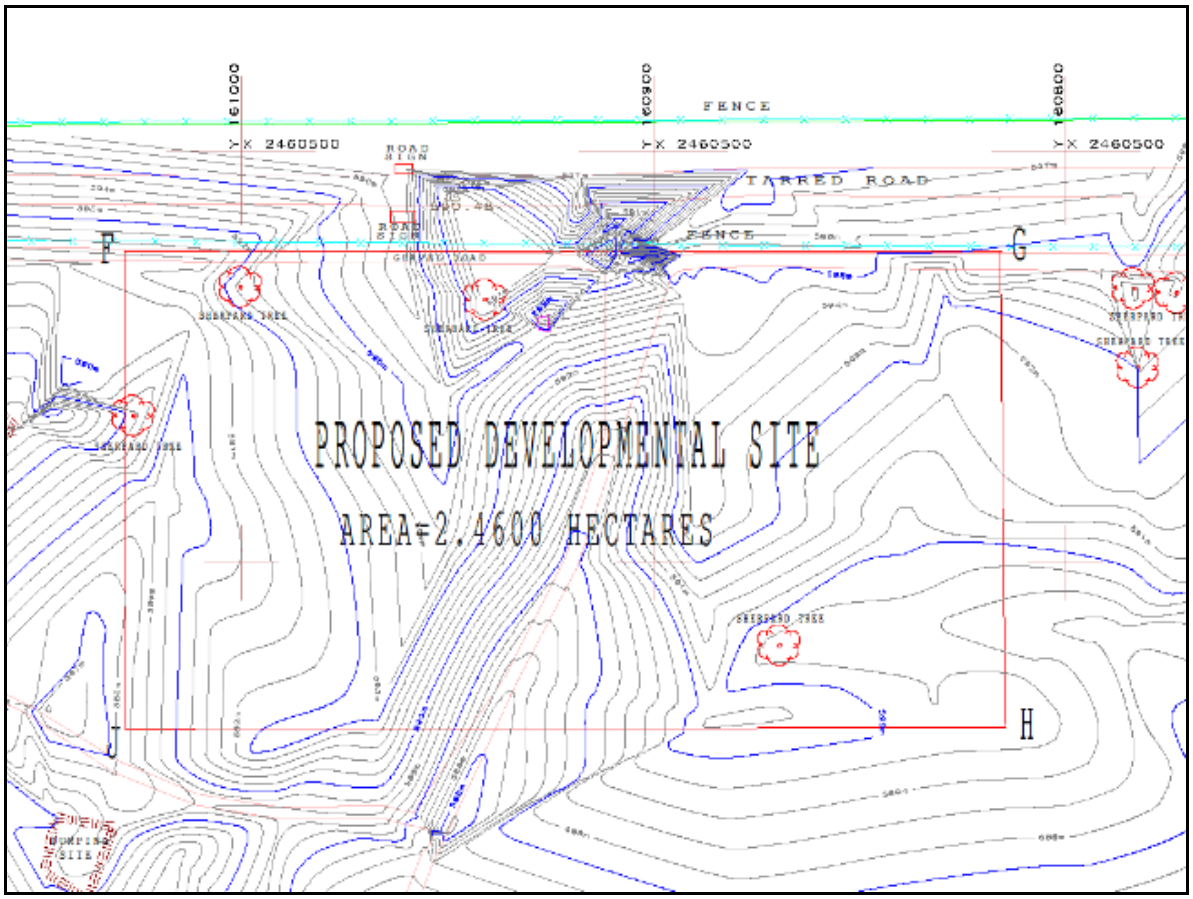

Figure 1. *Map of the demarcated terrain.*

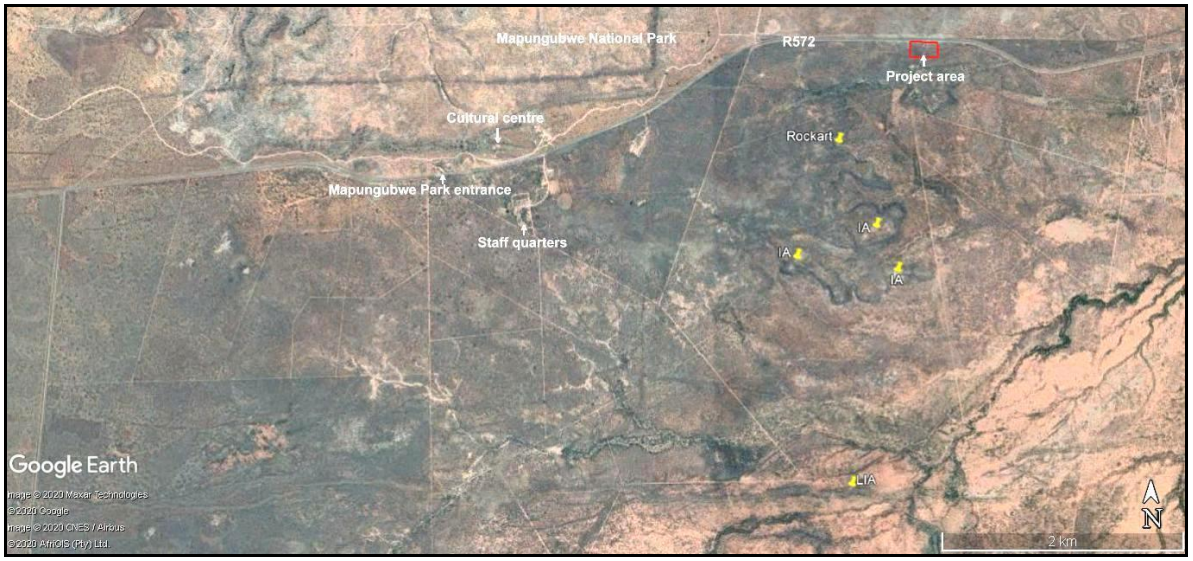

Figure 2. *Google image of the proposed development in relation to Mapungubwe National Park.*

Figure 3. *General view of the demarcated terrain.*

Figure 4. *View of the inner gravel road, the fence of Mapesu and the R572 at right.*

Figure 5. *View of the first rock art panel in the rock shelter.*

Figure 6. *View of the second rock art panel in the same rock shelter as above.*

Figure 7. *View of one archaeological site – unidentified, but probably Khami or Birwa.*

Figure 8. *View of historical period Venda site – marked LIA on the Google image.*

APPENDIX 1

PALAEONTOLOGICAL ASSESSMENT OF THE FARM NEKEL 45 MS, LIMPOPO PROVINCE.

DESKTOP STUDY AND PROTOCOL FOR PALAEONTOLOGICAL FINDS

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18/02/2020

EXECUTIVE SUMMARY

This study was carried out to assess the potential palaeontological impact of proposed industrial development on the farm Nekel 45 MS, part of Mapesu Game Reserve, adjacent to Mapungubwe on the R572 road, Limpopo Province. The regional 1:250 000 geological map shows the rocks underlying the farm to be Upper Karoo-age aeolian sandstones forming part of the Clarens Formation. This report indicates strong likelihood of finding fossils in these rocks. It is important that at least one SACNASP-registered palaeontologist visit the area to identify the fossils in situ and to retrieve those exposed during excavation. If a skeleton of a dinosaur such as Massospondylus is discovered, construction and excavation work should cease until a qualified palaeontologist from a recognised institution visits the site.

DESKTOP STUDY

The 1:250 000 geological map Sheet 2230 (Musina) was consulted to establish the regional and local geology. The map indicates the farm is mainly underlain by aeolian sandstones of the Clarens Formation of the Karoo Supergroup. In the extreme south of the farm, the geological map indicates a small portion to be underlain by conglomerates, sandstones and siltstones which likely belong to the underlying Bosbokpoort Formation.

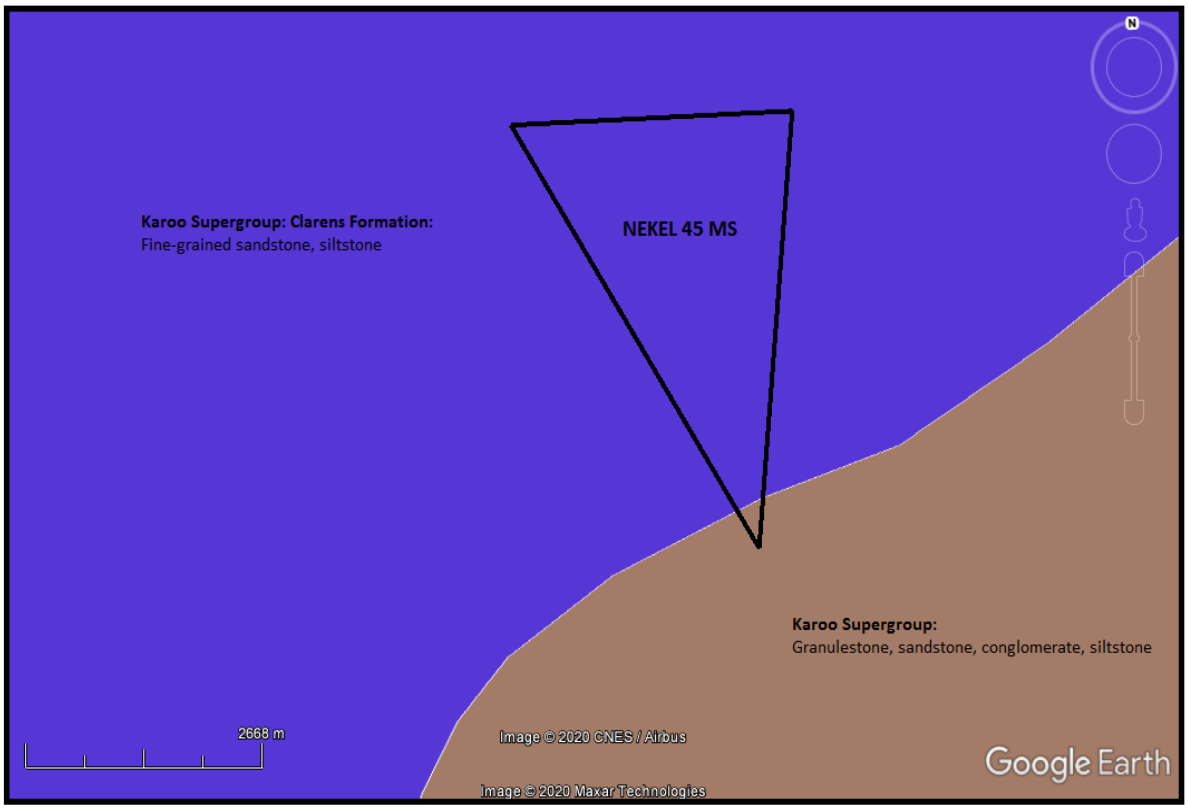


Fig 1. - Underlying geology of the farm Nekel 45 MS

GEOLOGY

The region is underlain by sedimentary rocks of the Karoo Supergroup.

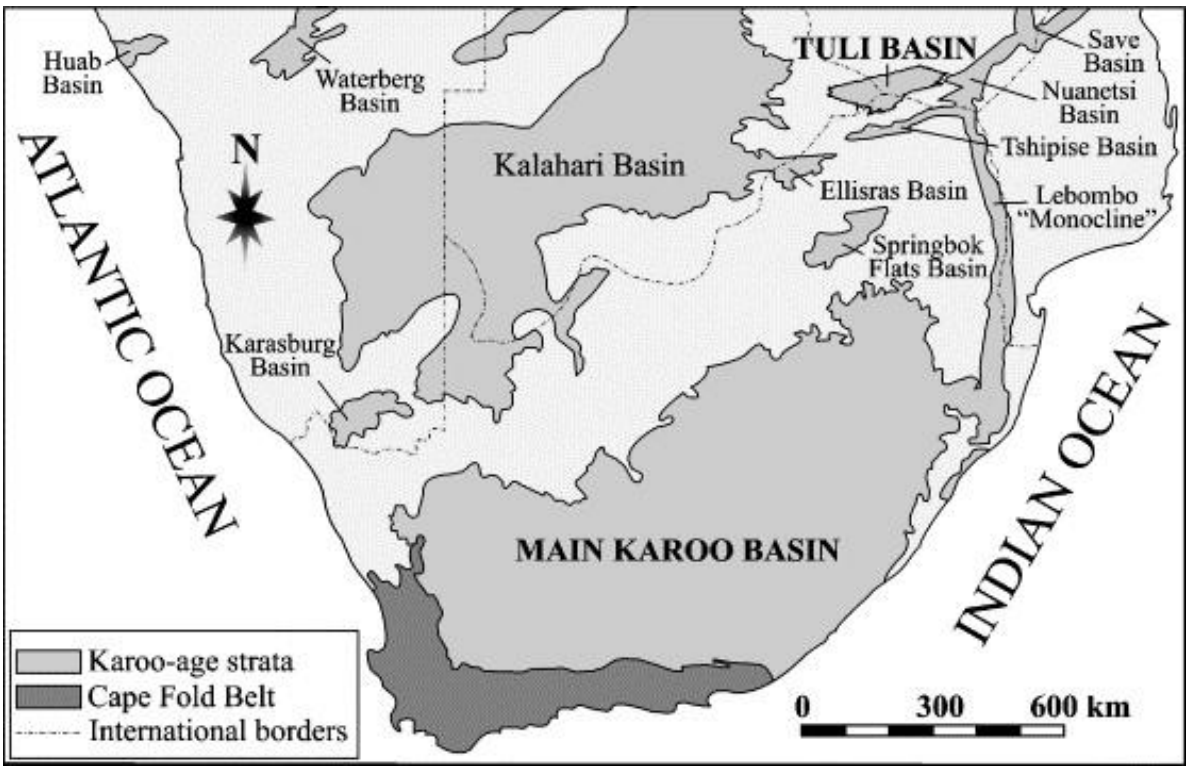


Fig. 2 - Location of Karoo rocks in southern Africa

The Karoo Supergroup

Rocks of Karoo age were laid down between the late Carboniferous and mid Jurassic. Deposition was on a stable floor, the Kaapvaal Craton to the north and the Namaqua-Natal Metamorphic Belt to the south. Approximately 50% of South Africa is covered by Karoo rocks. The Karoo Supergroup reflects changing sedimentary environments, from glacial, fluvial, lacustrine, through to aeolian. Sedimentation abruptly ceased with the extrusion of extensive basaltic lavas, heralding the break-up of the Gondwana landmass.

The main Karoo Basin covers much of the Free State, KwaZulu Natal and Northern Cape, but smaller depositories, developed in the north. Towards the end of Karoo times, these basins became blanketed by aeolian deposits of the Clarens Formation. The study area is underlain by such a depositary, the Tuli Block, which extends over the Limpopo River into both Botswana and Zimbabwe.

The Tuli Basin

Only the uppermost Karoo sedimentary rocks are represented in the study area, the fine aeolian desert sands of the Clarens Formation, although older fluvial sediments perhaps of

Bosbokpoort age, similar to the upper Elliot Formation of the Main Karoo Basin may be present in the extreme south of the farm.

Bosbokpoort Formation

The 1:250 000 geological map indicates a succession of sandstone, conglomerates and siltstone in the far south of the farm which is not typical of the mainly aeolian sandstone of the Clarens Formation and may instead form part of the Bosbokpoort Formation. These sediments form a thickness of up to 60m comprising mainly mudstones and siltstones. They are interpreted as meandering streams and flood plains in an increasingly arid environment. This arid to semi-arid environment would have caused oxidation of sediments and the formation of calcareous nodules.

Clarens Formation

Towards the end of Karoo times, increasing aridity caused southern Africa to become an extensive desert, with aeolian sand blanketing the entire Karoo Basin. Barchan dunes with cross bedding are common. Small playa lakes developed, with ephemeral rivers in places. In the Tuli Basin, the Clarens Formation is subdivided into the older Red Rocks member and the younger Tshipise Member.

The Red Rocks Member is about 20 m thick and consists mainly of argillaceous sandstones deposited in distal floodplain overbank environments of meandering streams. At the top of the sequence, a 1 – 3 m calcareous layer with dinosaur bone fragments is present in places.

The **Tshipise Member** lies unconformably above the Red Rocks Member and consists of cross-bedded aeolian sand, barchan dunes and occasional lacustrine deposits from playa lakes. The unit varies from 5 m to 140 m.

Letaba Formation

These tholiitic basaltic lavas signal the end of Karoo sedimentation and the breakup of Gondwana. However they are not present in the study area, having likely been eroded.

PALAEONTOLOGY

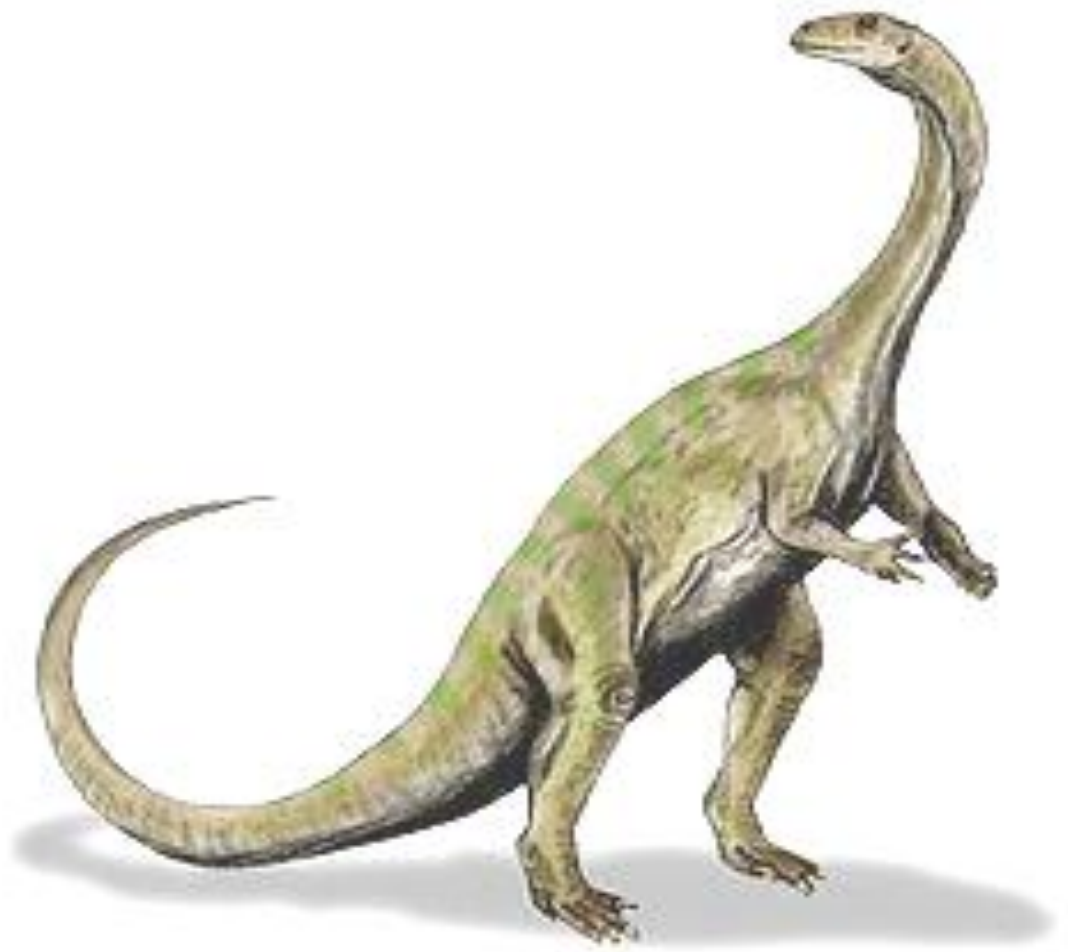
Rocks of the Karoo Supergroup are internationally acclaimed for their rich palaeontological heritage. In particular the Karoo documents the catastrophic End Permian Extinction and subsequent proliferation of life, early dinosaurs and the emergence of mammals. Since the Karoo hosts a number of coal seams, and coal is formed from plant remains it follows that these rocks host a well-documented palaeoflora. Fossil plants offer an opportunity to study palaeoecology and have been allocated a very high palaeontological sensitivity by the South African Heritage Resource Agency (SAHRA). In the Tuli Basin, the rocks are exceptionally fossiliferous. There are two groups: mainly plants from the Lower Karoo, including coal measures, and dinosaur fossils from the Upper Karoo. Only the Upper Karoo outcrops in this area, although the Lower Karoo biota is known to occur at depth.

Clarens Formation

The Red Rocks Member has yielded a death assemblage of assorted dinosaur bones. The prosauropod dinosaur Massospondylus was discovered in the Vhembe Reserve, adjacent

to the study area and across the border in Zimbabwe at Sentinel Ranch. There is a very strong likelihood that it could be found in the study area also.

The Clarens palaeolandscape exposed by the Limpopo River at Pontdrift, a short distance away from the study area, contains unique dinosaur trackways.



Massospondylus reconstruction

South African Palaeontology Legislation:

SOUTH AFRICAN NATIONAL HERITAGE RESOURCE ACT NO 25/1999

This Palaeontological Assessment forms part of the Heritage Impact Assessment (HIA) and complies with the requirements of the South African National Heritage Resource Act No 25 of 1999. A HIA is required under Section 38 (Heritage Resources Management) to assess any potential impact to the palaeontology of the area by a proposed development. The term palaeontological in this context is defined by the NHRA as "…any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rocks intended for industrial use and any site which contains

such fossilised remains or traces" (NHRA, 1999, p.10). The following clauses detailed below are relevant to palaeontological aspects for a terrain suitability assessment.

Subsection 35 (4)

- No person may, without a permit issued by the responsible heritage resource authority:
- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological of palaeontological site or 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 assists 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.

RECOMMENDATIONS

In mitigation, at least one recognised palaeontologist should be on site to monitor and if necessary collect fossils that may be exposed during deep excavation for building work. Any fossils such obtained should be deposited with a recognised authority such as the Council for Geoscience, Bernard Price Institute for Palaeontology or the Department of Geology and Mining, University of Limpopo. Should dinosaur bones be exposed it is essential that work cease immediately and an appropriate institution such as those listed above, should also direct excavation.

CONCLUSION

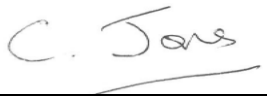
This desktop study indicates that there is a very high likelihood of the occurrence of fossils, typically assorted dinosaur bones from the Red Rocks Member or even complete life assemblage skeletons of the codont dinosaurs such as Massospondylus.

REFERENCES

Bordy, EM, 2000. Sedimentology of the Karoo Supergroup in the Tuli Basin (Limpopo River area), South Africa. Unpubl. PhD thesis, Rhodes University. 545p.

Johnson, M.R.; Van Vuuren, C.J.; Hegenberger,W.F.; Key, R. & Shoko, U. (1996) Stratigraphy of the Karoo Supergroup in southern Africa: an overview. J. Afr. Earth Sci., 23(1), 3-15.

Smith, R.H.M.; Eriksson, P.G. & Botha, W.J. (1993) A review of the stratigraphy and sedimentary environments of the Karoo-aged basins of Southern Africa. J.Afr. Earth Sci., 16, 143-169.



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