Archaetnos Culture & Cultural
Resource Consultants
BK 98 09854/23

A DRAFT REPORT ON AN ARCHAEOLOGICAL IMPACT ASSESSMENT OF BOKONI PERMITTING PROJECT LIMPOPO PROVINCE

For:

SRK Consulting (South Africa) (Pty) Ltd.
SRK House, 265 Oxford Road,
Illovo,
Johannesburg, South Africa 2198

REPORT NO.: 02303V

By:

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19 January 2023

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SUBMISSION OF REPORT

Please note that the South African Heritage Resources Agency (SAHRA) or one of its subsidiary bodies needs to comment on this report.

It is the client's responsibility to do the submission via the SAHRIS System on the SAHRA website. Arrangements can however be made if necessary.

Clients are advised not to proceed with any action before receiving the necessary comments from SAHRA.

DISCLAIMER

Although all possible care is taken to identify all sites of cultural importance during the survey of study areas, the nature of archaeological and historical sites is as such that it always is possible that hidden or subterranean sites could be overlooked during the study. Access to certain areas is also sometimes limited. Archaetnos and its personnel will not be held liable for such oversights or for costs incurred as a result thereof. Any additional sites identified can be visited and assessed afterwards and the report amended, but only upon receiving an additional appointment.

EXECUTIVE SUMMARY

Archaetnos cc was requested by SRK Consulting (South Africa) (Pty) Ltd. to conduct an Archaeological Impact Assessment (AIA) for the proposed Bokoni Permitting Project. The project will include underground mining, surface mining, processing development and supporting infrastructure. The underground mining includes new infrastructure as well as alterations and changes to the existing infrastructure. Surface mining consist of, open pits, waste rock dumps, Return of Mine (RoM) Stockpiles and Pollution Control Dams (PCDs). The processing development includes, new concentrator, utilisation of the existing concentrator and Tailing Storage Facility (TSF). Linear infrastructure comprises of conveyors, roads, pipelines and powerlines. Other activities include water treatment plants, package plants, ventilation shafts as well as potential demolition.

The mine located on the following farms: Diamand 422 KS, Zeekoegat 421 KS, Middelpunt 420 KS, Umkoanesstad 419 KS, Wintersveld 417 KS, Brakfontein 464 KS, Moeijelyk 412 KS,Klipfontein 465 KS, and Zwartkoppies 413 KS in the jurisdiction of the Fetakgomo Tubatse Local Municipality in the Sekhukhune District Municipality, Limpopo Province. This study was only done at the areas for the processing plant and associated conveyor, the explosives magazine and Klipgat section of the mine.

The project is done as part of mine expansion and infrastructure development as part of existing mine. The client indicated the area to be surveyed. It was surveyed via foot and off-road vehicle.

A survey of literature was undertaken in order to obtain background information regarding the area. The field survey was conducted according to generally accepted HIA practices and was aimed at locating all possible objects, sites, and features of cultural significance in the area of proposed development.

One site of cultural heritage importance was identified.

The following is recommended:

1. The site identified (no. 1) receives a field rating of Local Grade IIIB: The site should be included in the heritage register and may be mitigated (high/ medium significance). Mitigation is subject to a permit application lodged with the relevant heritage authority. See Appendix F for potential impact and mitigation measures.

2. Stone tools sites and Iron Age sites have been identified in a previous study within and close to the proposed development, and care should be taken during construction not to disturb these sites.

3. The proposed project may therefore continue, but only after implementation of mitigation measures and receiving comments from SAHRA.

4. It should be noted that the subterranean presence of archaeological and/or historical sites, features or artefacts is always a distinct possibility. Care should therefore be taken when development commences that if any of these are discovered, work on site immediate cease and a qualified archaeologist be called in to investigate the occurrence.

It is also important to take cognizance that it is the client's responsibility to do the submission of this report via the SAHRIS System on the SAHRA website. No work on site may commence before receiving the necessary comments from SAHRA.

CURRICULUM VITAE
Prof. Anton Carl van Vollenhoven

PERSONAL INFORMATION

- Born: 20 January 1966, Pretoria, RSA
- Address: Archaetnos, PO Box 55, Groenkloof, 0027
- Cell phone: 083 291 6104
- Nationality: RSA
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TERTIARY EDUCATION

- BA 1986, University of Pretoria
- BA (HONS) Archaeology 1988 (cum laude), University of Pretoria
- MA Archaeology 1992, University of Pretoria
- Post-Graduate Diploma in Museology 1993 (cum laude), University of Pretoria
- Diploma Tertiary Education 1993, University of Pretoria
- DPhil Archaeology 2001, University of Pretoria.
- MA Cultural History 1998 (cum laude), University of Stellenbosch
- Management Diploma 2007 (cum laude), Tshwane University of Technology
- DPhil History 2010, University of Stellenbosch

EMPLOYMENT HISTORY

Current:

- *August 2007* – present – Managing Director for Archaetnos Archaeologists.
- *Since 2012*: Archaeologist and heritage official, Department of Environment and Agriculture, City of Tshwane
- *Since 2015*: Extraordinary Professor of History at the North-West University

Previous:

- *1988-1991:* Fort Klapperkop Military Museum - Researcher
- *1991-1999:* National Cultural History Museum. Work as Archaeologist, as well as Curator/Manager of Pioneer Museum (1994-1997)
- *1999-2002:* City Council of Pretoria. Work as Curator: Fort Klapperkop Heritage Site and Acting Deputy Manager Museums and Heritage.
- *2002*-2007: City of Tswhane Metropolitan Municipality. Work as Deputy Manager Museums and Heritage.
- *August 2007* – present – Managing Director for Archaetnos Archaeologists.
- *1988-2003*: Part-time lecturer in Archaeology at the University of Pretoria and a part-time lecturer on Cultural Resources Management in the Department of History at the University of Pretoria.
- *2014-2015*: Part-time lecturer for the Honours degree in Museum Sciences in the Department of History and Heritage Studies at the University of Pretoria
- *2020-2022*: Part-time lecturer in History at the North-West University

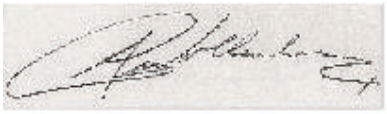
OTHER

- NRF C2 Research rating.
- Has published 42 peer-reviewed and 56 popular articles.
- Hs written 13 books/book contributions/conference proceedings .
- Has been the author and co-author of over 1 118 unpublished reports on cultural resources surveys and archaeological work.
- Has delivered more than 84 papers and lectures at national and international conferences.
- Member of SAHRA Council for 2003 – 2006.
- Member of the South African Academy for Science and Art.
- Member of Association for South African Professional Archaeologists. (Council member since 2022).
- Member of the South African Society for Cultural History (Chairperson 2006-2008; 2012-2014; 2018-2021).
- Has been editor for the SA Journal of Cultural History 2002-2004.
- Editorial member of various scientific journals.
- Member of the Provincial Heritage Resources Agency, Gauteng's Council.
- Member of Provincial Heritage Resources Agency, Gauteng's HIA adjudication committee (Chairperson 2012-2024).

A list of reports can be viewed on www.archaetnos.co.za.

DECLARATION OF INDEPENDENCE

I, Anton Carl van Vollenhoven from Archaetnos, hereby declare that I am an independent specialist within the field of heritage management.

Signed:  Date: 19 January 2023

LIST OF ACRONYMS:

AIA – Archaeological Impact Assessment
CMP – Cultural Management Plan
EAP – Environmental Assessment Practitioner
EIA – Environmental Impact Assessment
HIA – Heritage Impact Assessment
PIA – Palaeontological Impact Assessment
SAHRA –South African Heritage Resources Agency

CONTENTS

1. INTRODUCTION

Archaetnos cc was requested by SRK Consulting (South Africa) (Pty) Ltd. to conduct an Archaeological Impact Assessment (AIA) for the proposed Bokoni Permitting Project. The project will include underground mining, surface mining, processing development and supporting infrastructure. The underground mining includes new infrastructure as well as alterations and changes to the existing infrastructure. Surface mining consist of, open pits, waste rock dumps, Return of Mine (RoM) Stockpiles and Pollution Control Dams (PCDs). The processing development includes, new concentrator, utilisation of the existing concentrator and Tailing Storage Facility (TSF). Linear infrastructure comprises of conveyors, roads, pipelines and powerlines. Other activities include water treatment plants, package plants, ventilation shafts as well as potential demolition.

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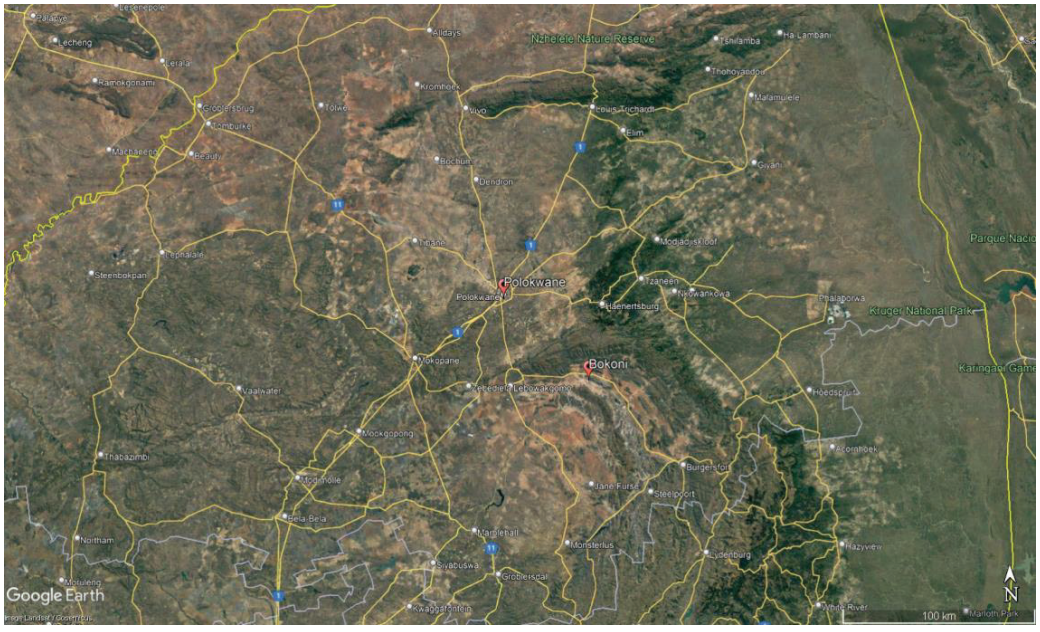

Figure 1: Location of Bokoni Mine in relation to Polokwane in the Limpopo Province.

Figure 2: Location of Bokoni Mine in relation to surrounding towns and settlements in the Limpopo Province.

Figure 3: The proposed development for the Bokoni Platinum Mine existing and proposed infrastructure expansion project.

2. TERMS OF REFERENCE

The Terms of Reference for the survey were to:

1. Identify objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in the surveyed area (see Appendix A).

2. Study background information on the area to be developed.

3. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, and aesthetic and tourism value (see Appendix B).

4. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions.

5. Recommend suitable mitigation measures to minimize possible negative impacts on the cultural resources by the proposed development.

6. Review applicable legislative requirements.

3. CONDITIONS & ASSUMPTIONS

The following conditions and assumptions have a direct bearing on the survey and the resulting report:

1. Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity (Appendix A). These include all sites, structure and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development. Graves and cemeteries are included in this.

2. The significance of the sites, structures and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects.

3. Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural

significance may or may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation (see Appendix C).

4. The latitude and longitude of any archaeological or historical site or feature, is to be treated as sensitive information by the developer and should not be disclosed to members of the public.

5. All recommendations are made with full cognizance of the relevant legislation.

6. It has to be mentioned that it is almost impossible to locate all the cultural resources in a given area, as it will be very time consuming. Developers should however note that this report should make it clear how to handle any other finds that might occur.

7. Large areas of the surveyed areas have been disturbed by recent human activity. This includes exiting mining infrastructure, housing, roads, office buildings and agricultural land, making it a low-risk area for finding heritage sites.

8. Most of the surveyed area had low and open vegetation cover, which had a positive effect on both the vertical and the horizontal archaeological visibility.

9. Due to active mining is some areas were not surveyed, but a visual assessment determined that the area is entirely disturbed.

4. LEGISLATIVE REQUIREMENTS

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

4.1 The National Heritage Resources Act

According to the above-mentioned act the following is protected as cultural heritage resources:

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years

f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites or scientific or technological value.

The national estate (see Appendix D) includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and paleontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment (AIA) only looks at archaeological resources. The different phases during the HIA process are described in Appendix E.

An HIA must be done under the following circumstances:

a. The construction of a linear development (road, wall, power line canal etc.) exceeding 300m in length
b. The construction of a bridge or similar structure exceeding 50m in length
c. Any development or other activity that will change the character of a site and exceed 5 000m^2 or involve three or more existing erven or subdivisions thereof
d. Re-zoning of a site exceeding 10 000 m^2
e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

Structures

Section 34 (1) of the mentioned act states that no person may demolish any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Alter means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or the decoration or any other means.

Archaeology, palaeontology and meteorites

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial):

a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite;
b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological 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 paleontological material or object, or any meteorite;
d. bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites, or
e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

Human remains

Graves and burial grounds are divided into the following:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries

f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

a. destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
b. destroy, damage, alter, exhume 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; or
c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

Human remains that are less than 60 years old are subject to provisions of the **National Health Act (Act 61 of 2003)** and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Exhumations** (**Ordinance no. 12 of 1980**) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place. Human remains can only be handled by a registered undertaker or an institution declared under the **National Health Act** (**Act 61 of 2003**).

4.2 The National Environmental Management Act

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made.

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

5. THE INTERNATIONAL FINANCE CORPORATIONS' PERFORMANCE STANDARD FOR CULTURAL HERITAGE

This standard recognizes the importance of cultural heritage for current and future generations. It aims to ensure that clients protect cultural heritage in the course of their project activities.

This is done by clients abiding to the law and having heritage surveys done in order to identify and protect cultural heritage resources via field studies and the documentation of such resources. These need to be done by competent professionals (e.g. archaeologists and cultural historians). Possible chance finds, encountered during the project development, also needs to be managed by not disturbing it and by having it assessed by professionals.

Impacts on the cultural heritage should be minimized. This include the possible maintenance of such sites in situ, or when impossible, the restoration of the functionality of the cultural heritage in a different location. When cultural historical and archaeological artefacts and structures need to be removed is should be done by professionals and by abiding to the applicable legislation.

The removal of cultural heritage resources may however only be considered if there are not technically or financially feasible alternatives. In considering the removal of cultural resources, it should be outweighed by the benefits of the overall project to the effected communities. Again, professionals should carry out the work and adhere to the best available techniques.

Consultation with affected communities should be engaged in. This entails that access to such communities should be granted to their cultural heritage if this is applicable. Compensation for the loss of cultural heritage should only be given in extra-ordinary circumstances.

Critical cultural heritage may not be impacted on. Professionals should be used to advise on the assessment and protection thereof. Utilization of cultural heritage resources should always be done in consultation with the effected communities in order to be consistent with their customs and traditions and to come to agreements with relation to possible equitable sharing of benefits from commercialization.

6. METHODOLOGY

6.1 Survey of literature

A survey of literature was undertaken in order to obtain background information regarding the area. This includes reports identified on the SAHRIS Database. Sources consulted in this regard are indicated in the bibliography. Four other studies in the adjacent area were noted with various others having been done in and around the proposed development area (SAHRIS database; Archaetnos database).

6.2 Field survey

The survey was conducted according to generally accepted HIA practices and was aimed at locating possible objects, sites, and features of cultural significance in the area of proposed development. Since one sometimes looks a bit wider than the demarcated area, as the surrounding context needs to be taken into consideration.

Where required, the location/position of any site was determined by means of a Global Positioning System (GPS)[1], while photographs were also taken where needed. The survey was undertaken by doing a physical survey via off-road vehicle and on foot and covered as much as possible of the area to be studied (Figure 4). Certain factors, such as accessibility, density of vegetation, etc. may however influence the coverage. Due to active mining and the slopes of the hills being extremely steep, some areas were not surveyed, but a visual assessment determined that the areas being entire disturbed. Accordingly, it is extremely unlikely to contain any heritage sites, making it a low-risk area.

The surveyed area was largely disturbed due to recent human activity, in the form of mining, related mining infrastructure, agriculture and housing of local communities. The agricultural activity in the area seems to be relatively old as many old agricultural fields were found. The size of the proposed development is approximately 55 Ha, and the survey took approximately 3 hours to complete.

6.3 Oral histories and social consultation

People from local communities are interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography.

[1] A Garmin Oregon 550 with an accuracy factor of a few meters.

Figure 4: Track route of the survey (In light blue).[2]

6.4 Documentation

All sites, objects, features, and structures identified were documented according to the general minimum standards accepted by the archaeological profession. Co-ordinates of individual localities were determined by means of the Global Positioning System (GPS). The information was added to the description in order to facilitate the identification of each locality.

6.5 Evaluation of Heritage sites

The evaluation of heritage sites is done by giving a field rating of each (see Appendix C) using the following criteria:

- The unique nature of a site
- The integrity of the archaeological deposit
- The wider historic, archaeological and geographic context of the site
- The location of the site in relation to other similar sites or features
- The depth of the archaeological deposit (when it can be determined or is known)
- The preservation condition of the site
- Uniqueness of the site and

[2] The survey was done together with another survey on the larger area and thus the track route is also outside of the surveyed area. The other survey is discussed in a separate report.

• Potential to answer present research questions.

7. DESCRIPTION OF THE ENVIRONMENT

The surveyed area is largely disturbed by mining, and mining related infrastructure, roads, housing, and animal husbandry (Figure 5-9). The vegetation growth in the surveyed area was low to medium in hight, varying from less dense to dense as the vegetation gets closer to the river (Figure 10). The under footing for the surveyed area was open which had a positive effect on both the vertical and the horizontal archaeological visibility (Figure 11).

The topography of the surveyed area varied form steep mountainous terrain in the north and flatter more even terrain to the south (Figure 12-13). The seasonal Rapholo river is to the south of the surveyed area (Figure 14).

Figure 5: Old mining dump in the surveyed area.

Figure 6: Mining related infrastructure in the surveyed area.

Figure 7: Existing roads in the surveyed area.

Figure 8: View of contemporary abandoned buildings in the surveyed area.

Figure 9: View of over grazed terrain in the surveyed area.

Figure 10: General view of vegetation growth in the surrounding area.

Figure 11: View of dense vegetation growth close to the river in the surveyed area.

Figure 12: Mountainous terrain in the northern parts of the surveyed area.

Figure 13: Flat terrain in the southern parts of the surveyed area.

Figure 14: View of Rapholo riverbed in the surveyed area.

8. HISTORICAL CONTEXT

One site of cultural heritage significance was located during the survey. Some background information is given in order to place the surveyed area in a broad

historical and geographical context and to contextualize possible finds that could be unearthed during construction activities.

A large number of heritage reports were completed around the towns of Steelpoort and Burgersfort previously (SAHRA's SAHRIS database; Archaetnos database). These are included in the discussion below.

8.1 Stone Age

The Stone Age is the period in human history when lithic material was mainly used to produce tools (Coertze & Coertze 1996: 293). In South Africa the Stone Age can be divided in three periods. It is, however, important to note that dates are relative and only provide a broad framework for interpretation. The division for the Stone Age according to Korsman & Meyer (1999: 93-94) is as follows:

Early Stone Age (ESA) 2 million – 150 000 years ago
Middle Stone Age (MSA) 150 000 – 30 000 years ago
Late Stone Age (LSA) 40 000 years ago – 1850 - A.D.

No Stone Age sites are indicated in a historical atlas of this area. However, one needs to take note that this may only indicate a lack of research in the area. The closest Stone Age sites indicated in the atlas is Middle and Late Stone Age sites close to Ohrigstad (Bergh 1999: 5).

Stone Age material was however found during various surveys in and around Burgersfort and Steelpoort. This includes rock paintings at the Two Rivers Mine (Archaetnos database). Higgitt et.al. (2015: 21-22) did identify MSA tools on the farm De Grooteboom. These were however found in eroded areas, an indication that it likely were in a secondary context. It also was located towards the south of the current surveyed area.

The environment definitely would be supportive to Stone Age activities. The nearby mountains give natural shelter and material to make stone tools from. The streams would lure animals to the area and these people would therefore have hunted here. The natural rock mostly includes shale, which is a soft stone, meaning that that there are very limited resources from which to make stone tools. This would most likely be limited to the mountain tops. One should therefore be on the lookout for stone tools during construction work on the site.

In fact, some stone tools were found during the survey (Figure 15). These date to the Middle and Late Stone Age but were found scattered and out of context along the river or in the eroded area.

Figure 15: MSA and LSA Stone tools found during the survey.

8.2 Iron Age

The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artifacts (Coertze & Coertze 1996: 346). In South Africa it can be divided in two separate phases according to Van der Ryst & Meyer (1999: 96-98), namely:

Early Iron Age (EIA) 200 – 1000 A.D.
Late Iron Age (LIA) 1000 – 1850 A.D.

Huffman (2007: xiii) however, indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

Early Iron Age (EIA) 250 – 900 A.D.
Middle Iron Age (MIA) 900 – 1300 A.D.
Late Iron Age (LIA) 1300 – 1840 A.D.

The nearest Early Iron Age site to the surveyed area is the sites at Lydenburg and Klingbeil to the south-east of the surveyed area. A large number of Late Iron Age sites have previously been identified in an area roughly stretching between Lydenburg, Nelspruit and Badplaas (Bergh 1999: 6-7).

Other sites have also been identified by Archaetnos during surveys in the area (Archaetnos database). Iron Age potshards and features have been located at the farm De Grooteboom by Higgitt et.al. (2015: 22-24). These were towards the south of the current area being investigated.

During the current survey lower and upper grinding stones (Figure 16) were found close to the river. Pottery, with and without decoration was also found in the eroded area, thus being out of context (Figure 17). It therefore serves as proof that these people did utilize the area.

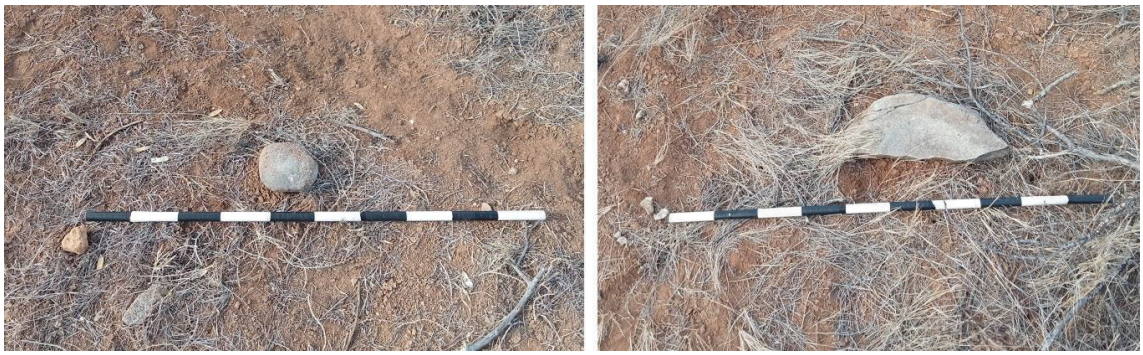

Figure 16: Upper grinding stone (Left) and broken lower grinding stone (right).

Figure 17: Pottery found during survey in the eroded area.

The general broader environment around the surveyed area is suitable for Iron Age people. The mountains would give shelter and building material and the valleys good grazing and ample water sources. One would therefore expect that Iron Age people may have utilized the area. The white settlers moved into this environment later on for the same reason.

8.3 Historical Age

The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write. This era is sometimes called the Colonial era or the recent past.

Due to factors such as population growth and a decrease in mortality rates, more people inhabited the country during the recent historical past. Therefore and because less time has passed, much more cultural heritage resources from this era have been left on the landscape. It is important to note that all cultural resources older than 60 years are potentially regarded as part of the heritage and that detailed studies are needed in order to determine whether these indeed have cultural significance. Factors to be considered include aesthetic, scientific, cultural and religious value of such resources.

It is known that one of the early trade routes passed along the Steelpoort River (Bergh 1999: 9). At the beginning of the 19th century the area was inhabited by the Koni, Tau, Pedi and Roka who are all of Sotho origin. During the Difaquane, in ca.1822, the Ndebele of Mzilikazi entered this area from the south. In 1825 a Zulu group under

Zwide attacked the Ndebele here. As a result these other groups fled to the north. They returned later on (Bergh 1999: 10-11).

None of the early travellers who visited the old Transvaal visited this area. In 1836 the Voortrekker groups of Tregardt and Van Rensburg passed to the west of the Steelpoort River (Bergh 1999: 13-14). The land around Lydenburg, including the Steelpoort River Valley was traded from the Swazi in 1846 and the first white settlers then started farming here (Bergh 1999: 16, 130-132).

Historical structures, such as farm houses and infrastructure may therefore be found in the area. Such buildings have been identified on neighboring farms during past surveys (Archaetnos database). Signs of the earliest historical mining activities were also identified on adjacent farms (Archaetnos database; Stegmann & Roodt 2012). Many graves from this period are also known from other nearby farms (Archaetnos database).

One Provincial Heritage site is known from the area. About 10 km towards the south of the study area the Tšate Valley site is situated (Figure 18-19). It commemorates the rise of the Pedi Kingdom.

Figure 18: Commemorative stone for British soldiers who died in the war against the Pedi State.

Figure 19: Statue of Chief Sekhukhune.

9. DISCUSSION OF HERITAGE RESOURCES IDENTIFIED DURING THE SURVEY

One site was identified during this survey. Database research showed various sites in the greater geographical area. The closest to the study area are those found by Coetzee (2017, 2022) and Pelser (2021, 2022). The nearest site identified by Coetzee (2017, 2022) is the ruins of old building about 0,5 km from the investigated area (Figure 20). Pelser (2021, 2022) identified scattered Stone Age and Iron Age remains along the Rapholo River (Figure 21).

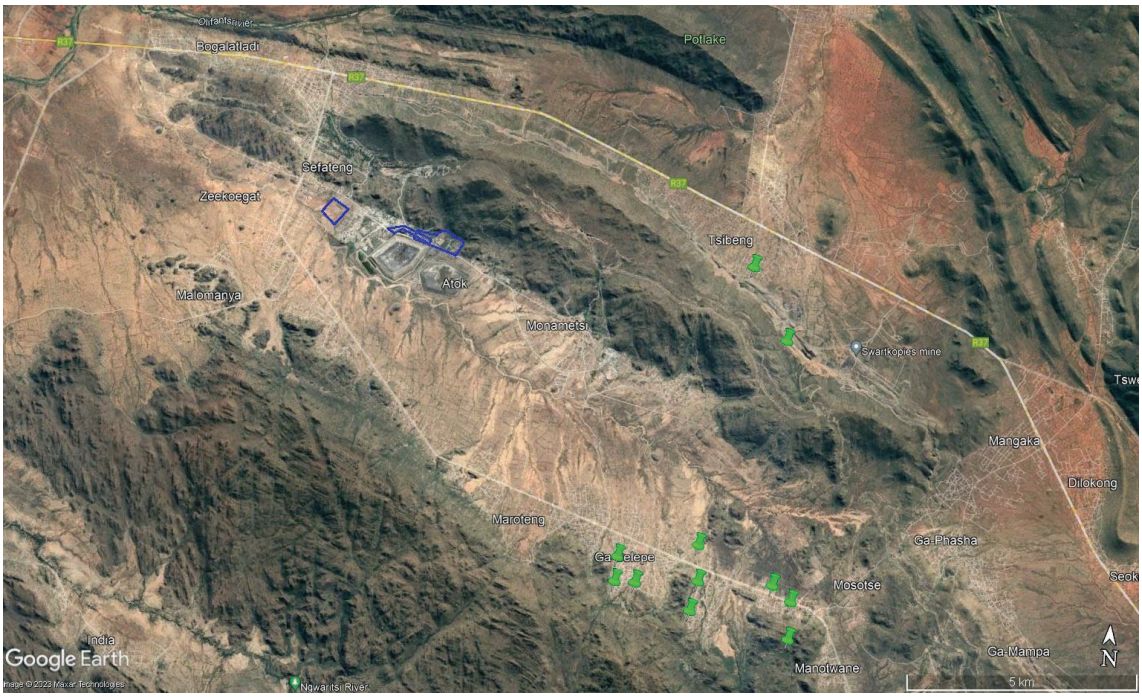

Figure 20: Location of the heritage sites identified by Coetzee (2017, 2022).

Figure 21: Location of heritage sites identified (Blue: Stone stools, Red: Iron Age remains) by Pelser (2021, 2022).

9.1 Site 1 – Stone Terraces

This site consists of the remains of at least 19 stone terraces, spanning an area of about 300 x 100 m. The site is located inside the proposed development and will be affected by the development. The site likely is older than 60 years, but without artefactual evidence this is difficult to tell (Figure 22-23).

GPS: 24°17'33.35"S 29°53'2.38"E

Figure 22: View of stone structure at Site 1.

Figure 23: View of dirt road cutting through structure at Site 1.

Cultural significance Table: Site 1

A place is considered to be part of the national estate if it has cultural significance because of -	**Applicable or not**	**Rating: 1=Negligible/ 2=Low/ 3=Low-Medium/ 4= Medium/ 5=Medium-High/ 6=High/ 7=Very High**
Its importance in the community or pattern of South Africa's history	**Y**	**Low-Medium**
Its possession of uncommon, rare, or endangered aspects of South Africa's natural or cultural history	**N**	
Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage	**Y**	**Low**
Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects	**Y**	**Low-Medium**
Its importance in exhibiting particular aesthetic characteristics valued by a community cultural group	**N**	
Its importance in demonstrating a high degree of creative or technical achievement at a particular period	**Y**	**Low-Medium**
Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons	**N**	
Its strong or special association with the life or work of a person, group or organization of importance in the history of South Africa	**N**	

Sites of significance relating to the history of slavery in South Africa	**N**	
Reasoned assessment of significance using appropriate indicators outlined above:		**3-Low-Medium**

Integrity scale:

1 – Bad state of preservation, but no contextual information
2 – Bad state of preservation and includes contextual information
3 – Reasonable state of preservation, but no contextual information
4 – Reasonable state of preservation and includes contextual information
5 – Good state of preservation, but no contextual information
6 - Good state of preservation and includes contextual information
7 – Excellent state of preservation, but no contextual information
8 – Excellent state of preservation and includes contextual information

Field-rating = Cultural significance x Integrity
= 3 (Low-Medium) x 3
= 9

The field rating therefore is Local Grade IIIB: The site should be included in the heritage register and may be mitigated (high/ medium significance). Mitigation is subject to a permit application lodged with the relevant heritage authority. See Appendix F for potential impact and mitigation measures.

10. CONCLUSION AND RECOMMENDATIONS

The heritage survey in the indicated area was completed successfully. One site was identified during the survey (Figure 24).

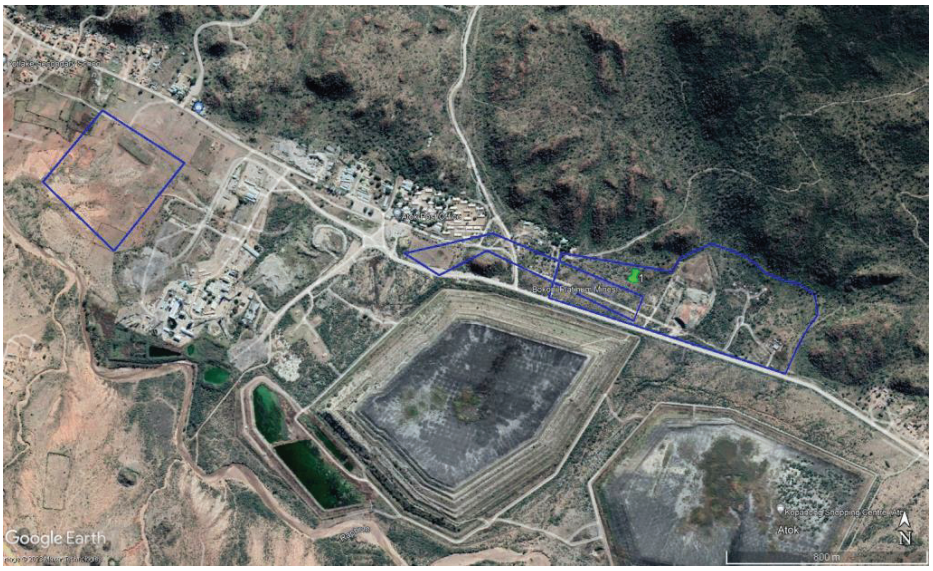

Figure 24: Location of the site identified during the survey (Green Pin).

The following is recommended:

1. The site identified (no. 1) receives a field rating of Local Grade IIIB: The site should be included in the heritage register and may be mitigated (high/ medium significance). Mitigation is subject to a permit application lodged with the relevant heritage authority. See Appendix F for potential impact and mitigation measures.

2. Stone tools sites and Iron Age sites have been identified in a previous study within and close to the proposed development, and care should be taken during construction not to disturb these sites.

3. The proposed project may therefore continue, but only after implementation of mitigation measures and receiving comments from SAHRA.

4. It should be noted that the subterranean presence of archaeological and/or historical sites, features or artefacts is always a distinct possibility. Care should therefore be taken when development commences that if any of these are discovered, work on site immediate cease and a qualified archaeologist be called in to investigate the occurrence.

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APPENDIX A

DEFINITION OF TERMS:

Site: A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artefacts, found on a single location.

Structure: A permanent building found in isolation or which forms a site in conjunction with other structures.

Feature: A coincidental find of movable cultural objects.

Object: Artefact (cultural object).

(Also see Knudson 1978: 20).

APPENDIX B

DEFINITION/ STATEMENT OF HERITAGE SIGNIFICANCE:

Historic value:	Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.
Aesthetic value:	Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.
Scientific value:	Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period
Social value:	Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
Rarity:	Does it possess uncommon, rare or endangered aspects of natural or cultural heritage.
Representivity:	Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province region or locality.

APPENDIX C

SIGNIFICANCE AND FIELD RATING:

Cultural significance:

- Low — A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.

- Medium — Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.

- High — Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

Heritage significance:

- Grade I — Heritage resources with exceptional qualities to the extent that they are of national significance

- Grade II — Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate

- Grade III — Other heritage resources of local importance and therefore worthy of conservation

Field ratings:

National Grade I significance	should be managed as part of the national estate
Provincial Grade II significance	should be managed as part of the provincial estate
Local Grade IIIA	should be included in the heritage register and not be mitigated (high significance)
General protection A (IV A)	site should be mitigated before destruction (high/ medium significance)
General protection B (IV B)	site should be recorded before destruction (medium significance)
General protection C (IV C)	phase 1 is seen as sufficient recording and it may be demolished (low significance)

APPENDIX D

PROTECTION OF HERITAGE RESOURCES:

Formal protection:

National heritage sites and Provincial heritage sites – grade I and II
Protected areas - an area surrounding a heritage site
Provisional protection – for a maximum period of two years
Heritage registers – listing grades II and III
Heritage areas – areas with more than one heritage site included
Heritage objects – e.g. archaeological, palaeontological, meteorites, geological specimens, visual art, military, numismatic, books, etc.

General protection:

Objects protected by the laws of foreign states
Structures – older than 60 years
Archaeology, palaeontology and meteorites
Burial grounds and graves
Public monuments and memorials

APPENDIX E

HERITAGE IMPACT ASSESSMENT PHASES

1. Pre-assessment or scoping phase – establishment of the scope of the project and terms of reference.
2. Baseline assessment – establishment of a broad framework of the potential heritage of an area.
3. Phase I impact assessment – identifying sites, assess their significance, make comments on the impact of the development and makes recommendations for mitigation or conservation.
4. Letter of recommendation for exemption – if there is no likelihood that any sites will be impacted.
5. Phase II mitigation or rescue – planning for the protection of significant sites or sampling through excavation or collection (after receiving a permit) of sites that may be lost.
6. Phase III management plan – for rare cases where sites are so important that development cannot be allowed.

APPENDIX F

POTENTIAL IMPACT ASSESSMENT TABLE

Potential Impact Assessment Table

Activity	Nature of the impact		Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation							Degree of mitigation (%)
			P	D	E	M	LoR	Significance			P	D	E	M	LoR	Significance		
Pre-Construction Phase																		
Surveyes and people movement	*Minor disturbances of structures*	-	2	1	1	2	1	8	Low	*All personal in the area needs to be aware of the site*	1	1	1	2	1	4	Low	50,0
Natural degradation	*Natural degradation of site*	+	5	5	1	2	4	40	Moderate	*None*	5	5	1	2	4	40	Moderate	0,0
Construction Phase																		
General construction activities	*Destruction of site due to infrastructure and vehicle activities*	-	5	2	1	10	5	65	High	*Recording of site and Observed destruction and artifact collection at the site*	5	2	1	6	3	45	Moderate	30,8
Operational Phase																		
General Operational actifies	*None as site is demolished in Construction Phase*	-	1	5	0	2	1	7	Low	*None*	1	5	0	2	1	7	Low	0,0
Closure/Rehabilitation Phase																		
General Closure/Rehabilitation	*None as site is demolished in Construction Phase*	-	1	5	0	2	1	7	Low	*None*	1	5	0	2	1	7	Low	0,0
Post-Closure Phase																		
General Post-Closure activities	*None as site is demolished in Construction Phase*	-	1	5	0	2	1	7	Low	*None*	1	5	0	2	1	7	Low	0,0

Exemption Letter – Proposed Bokoni Expansion Project, Limpopo Province

Heidi Fourie – Palaeontological Impact Assessment

Farm: Winterveld 417- KS, Middelpunt 420-KS, Zeekoegaat 421-KS

Protocol for a Chance Fossil Find is included.

The applicant, African Rainbow Minerals Limited (ARM) proposes the development of the Klipgat portal.

This study was only done at the areas for the processing plant and associated conveyor , the explosives magazine and Klipgat section of the mine

Additionally, a new water treatment plant, explosive magazine, ventilation shafts, post office, and package sewage treatment plants will be established. The approximate size of the site is 4400 hectares.

Landowners: BPM

Summary

This letter serves as a Letter of Exemption. It is in compliance with The Minimum Standards for Palaeontological Components of Heritage Impact Assessment Reports, SAHRA APMHOB, Guidelines 2012. The development is underlain by the rocks of mostly the Bushveld Complex, Vaalian in age, with a **VERY LOW** Palaeontological Sensitivity (Groenewald and Groenewald 2014*). This development will take place on igneous rocks, therefore, the impact will be **VERY LOW**.

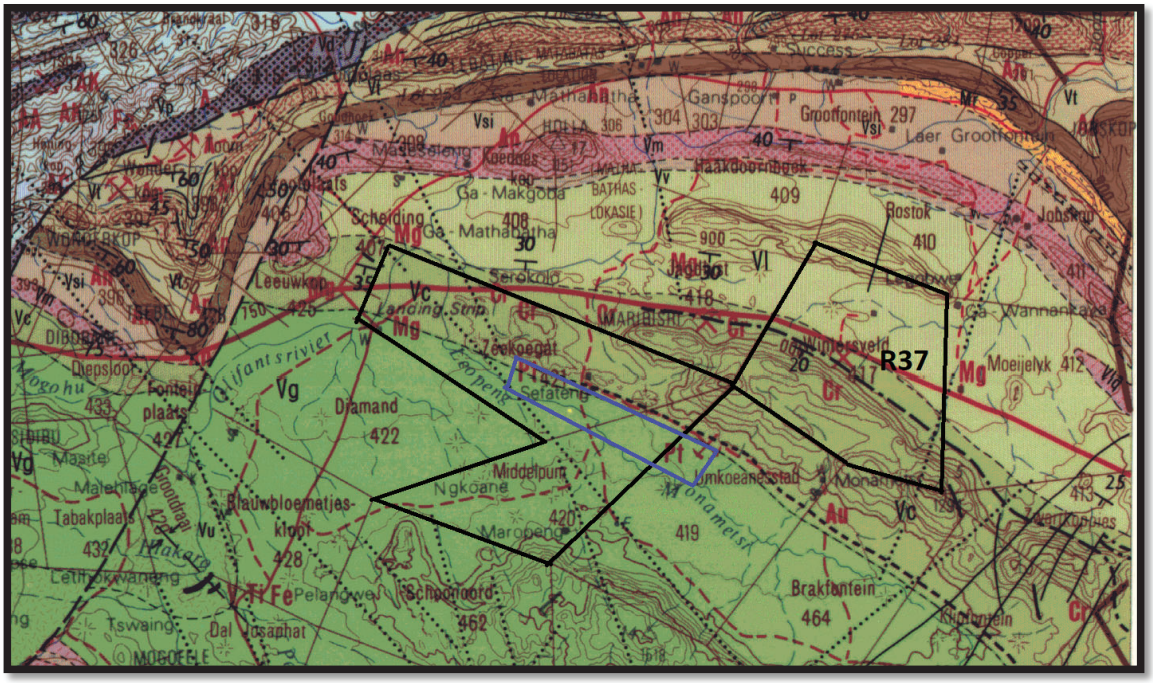


Figure 1: Geology of area (1:250 000 2428 Nylstroom).

Legend to Figure:

Vg – Gabbro, norite, anorthosite (green). Main Zone, Rustenburg Layered Suite, Bushveld Complex. Vaalian.

Vc – Pyroxenite, porphyritic pyroxenite, anorthosite, leuconorite, melanorite; chromitite layer (--) (khaki). Upper Zone, Rustenburg Layered Suite, Bushveld Complex. Vaalian.
Vl – Melanorite, pyroxenite, serpetinized hartzburgite, chromatite layer (--) (light green). Lower Zone, Rustenburg Layered Suite, Bushveld Complex. Vaalian.
----- - - Concealed geological boundary.
----f--- - Fault
⊥ 30˚ - Strike and dip.
□ – Approximate position of Expansion (blocked in blue).

Mining past and present:
Au – Gold Cr – Chrome Mg – Manganese Pt - Platinum
The mining past and present has an influence on the project.

The Bushveld Complex is a massive body of igneous origin and it is intrusive in the Transvaal Supergroup (Kent, 1980). The Bushveld Complex extends over 440 km east-west, from Burgersfort to Nietverdiend; and for nearly 350 km north-south from Villa Nora to Bethal. It covers an area of 65 000 km² and is chrome and platinum rich (Visser, 1989). The age is Vaalian (2,100 – 1,920 Ma). The layered rocks of the Bushveld Complex are generally believed to be the result of crystals settling out of magma during slow cooling. The magmatic events petrogenetically related to and generally considered part of the whole magmatic evolution of the Complex are, the diabase sills and the Rooiberg Group. The Complex consists of three main units or suites of which the Rustenburg Layered Suite is one (Kent, 1980), the other two are the Rashoop Granophyre Suite and Lebowa Granite Suite (Visser, 1989). The region will be covered by 'Bushveld' vegetation. The weathering product is known as 'black turf' (Kent, 1980; Visser, 1989). There is a presence of mining past and present with iron ore and the Merensky Reef. Magnesite mines provide magnesium carbonate for making heat-resistant bricks (Norman and Whitfield 2006). The Layered Suite is the source of an immense wealth of platinum, chrome and vanadium, and comprises six quite distinct zones.

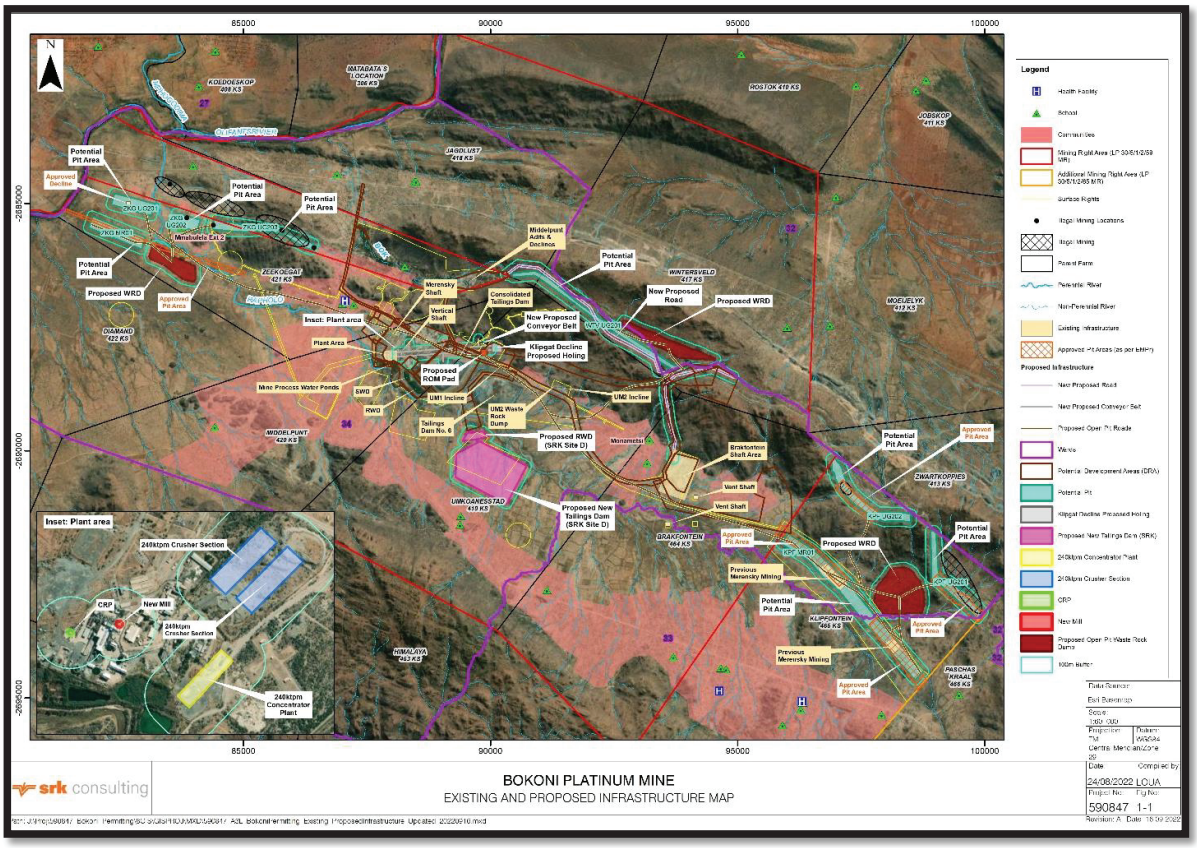


Figure 2a: Existing and Proposed Infrastructure map (SRK).

Figure 2b: Google Earth image showing new concentrator plant (SRK).

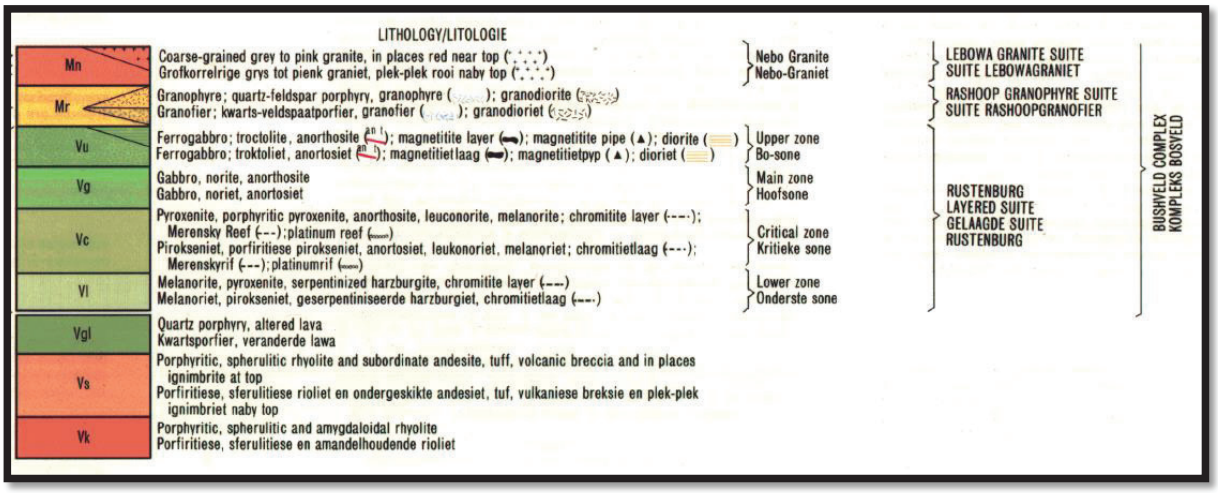


Figure 3: Lithostratigraphy (2428 Nylstroom).

Palaeontological Sensitivity

BUSHVELD MAGMATIC PROVINCE / BUSHVELD COMPLE diabase (Vdl) unnamed granophyre (VC) Rashoop Granophyre Suite (Vra) Croydon Subsuite (Vc) Dwars River Subsuite (Vdr) Dsjate Subsuite (Vds) Roossenekal Subsuite (Vrs) Lebowa Granite Suite (Vlg) Shelter Norite (Vsn)	Vdl; VC; Vra; Vc; Vdr; Vds; Vrs; Vlg; Vsh; Vsh1; Vmn; Vme; Vzo; Z; Z23; Z26; Vcr; Vdj; Vds; Vmt1;					Intrusive igneous rocks Late Vaalian / Early Proterozoic 2.06 Ga Mafic intrusives of Rustenberg Layered Suite Intrusive granites granophyres	No fossils recorded	Bushveld Complex has been described as "One of the great geological wonders of the world" – the largest layered igneous complex in the world with the richest reserves of platinum group metals known anywhere. Intruded between Magaliesberg Fm quartzites (Pretoria Group) and the Rooiberg Group volcanics.

*Groenewald, G. and Groenewald, D., 2014. SAHRA Palaeotechnical Report, South African Heritage Resources Agency.

No fossils recorded due to the igneous nature.

Recommendation

That Exemption from a Desktop Study for the proposed **Bokoni Expansion Project, Limpopo Province** be granted to the applicant taking into consideration all the above stated information.

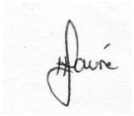
Declaration (disclaimer)

I, Heidi Fourie, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project for which I was appointed to do a palaeontological assessment. There are no circumstances that compromise the objectivity of me performing such work.

I accept no liability, and the client, by receiving this document, indemnifies me against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the use of the information contained in this document.

It may be possible that the Exemption Letter may have missed palaeontological resources in the project area as outcrops are not always present or visible on geological maps while others may lie below the overburden of earth and may only be present once development commences.

This report may not be altered in any way and any parts drawn from this report must make reference to this letter.



Heidi Fourie
2023/01/30

Protocol for Chance Finds and Management plan

This section covers the recommended protocol for a Phase 2 Mitigation process as well as for reports where the Palaeontological Sensitivity is **LOW;** this process guides the palaeontologist / palaeobotanist / ECO on site and should not be attempted by the layman / developer.

- As part of the Environmental Authorisation conditions, an Environmental Control Officer (ECO) will be appointed to oversee the construction/prospecting/mining activities in line with the legally binding Environmental Management Programme (EMPr) so that when a fossil is unearthed they can notify the relevant department and specialist to further investigate.
- All fossil finds must be placed in a safe place for further investigation.
- The ECO should familiarise him- or herself with the applicable formations and its fossils.
- Most Universities and Museums have good examples of fossils.
- The EMPr already covers the conservation of heritage and palaeontological material that may be exposed during construction/prospecting/mining activities. For a chance fossil find, the protocol is to cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation.
- It is recommended that the EMPr be updated to include the involvement of a palaeontologist when necessary, either for pre-construction training of ECO or for pre-determined site visits. The ECO must visit the site after clearing, drilling, excavations and blasting and keep a photographic record.
- The developer may be asked to survey the areas affected by the development and indicate on plan where the construction / development / mining will take place. Trenches may have to be dug to ascertain how deep the sediments are above the bedrock (can be a few hundred metres). This will give an indication of the depth of the topsoil, subsoil, and overburden, if need be trenches should be dug deeper to expose the interburden.

The palaeontological impact assessment process presents an opportunity for identification, access and possibly salvage of fossils and add to the few good localities. Mitigation can provide valuable onsite research that can benefit both the community and the palaeontological fraternity. A Phase 2 study is very often the last opportunity we will ever have to record the fossil heritage within the development area. Fossils excavated will be stored at a National Repository.