REF: 230HIA

9 October 2023

Att: **Ms Natasha Higgitt**
Archaeological Heritage Impact Assessor
South African Heritage Resources Agency
PO Box 4637
Cape Town
8000

By email: nhiggitt@sahra.org.za

Dear Ms Higgitt,

RECOMMENDATION FOR EXEMPTION FROM HERITAGE AND PALAEONTOLOGICAL IMPACT STUDIES: PROPOSED ALTERNATIVE POST-CLOSURE STRATEGY FOR THE TSHIPI BORWA MINE: AGRI-PROCESSING, NEAR HOTAZEL, NORTHERN CAPE PROVINCE - CASEID: 22297

Your interim comment dated 2 October 2023 refers.

1. Introduction

As noted in your letter and the submission by SLR Consulting regarding the need for an updated application specific Letter of Exemption regarding the change in the current closure commitments to the EMPr (**Figure 1**). Considering the proposed changes to the closure commitments:

- Concurrent backfill (in-pit dumping) during mining operations only;
- Backfilling and profiling of a portion of the waste rock back into the open pit as part of a partial backfill scenario;
- Sloping and rehabilitation of waste rock dumps remaining on surface, concurrent with mining operations;
- Removal of infrastructure and preparation of the site for final rehabilitation and closure;
- Cessation of dewatering activities to allow for the development of the proposed pit lake;

- Rehabilitation of any remaining WRDs (which did not form part of the operational phase concurrent rehabilitation);
- Maintenance, aftercare and monitoring of final landforms (rehabilitated areas, WRDs, partially backfilled pit and pit lake;
- Future access to readily available water supply in a pit lake; and
- Optimisation of the surface landforms and partially backfilled pit from an Environmental, Social and Governance (ESG) -focussed perspective,

It is evident that the main project component areas have already been assessed and included in previous heritage and palaeontological studies.

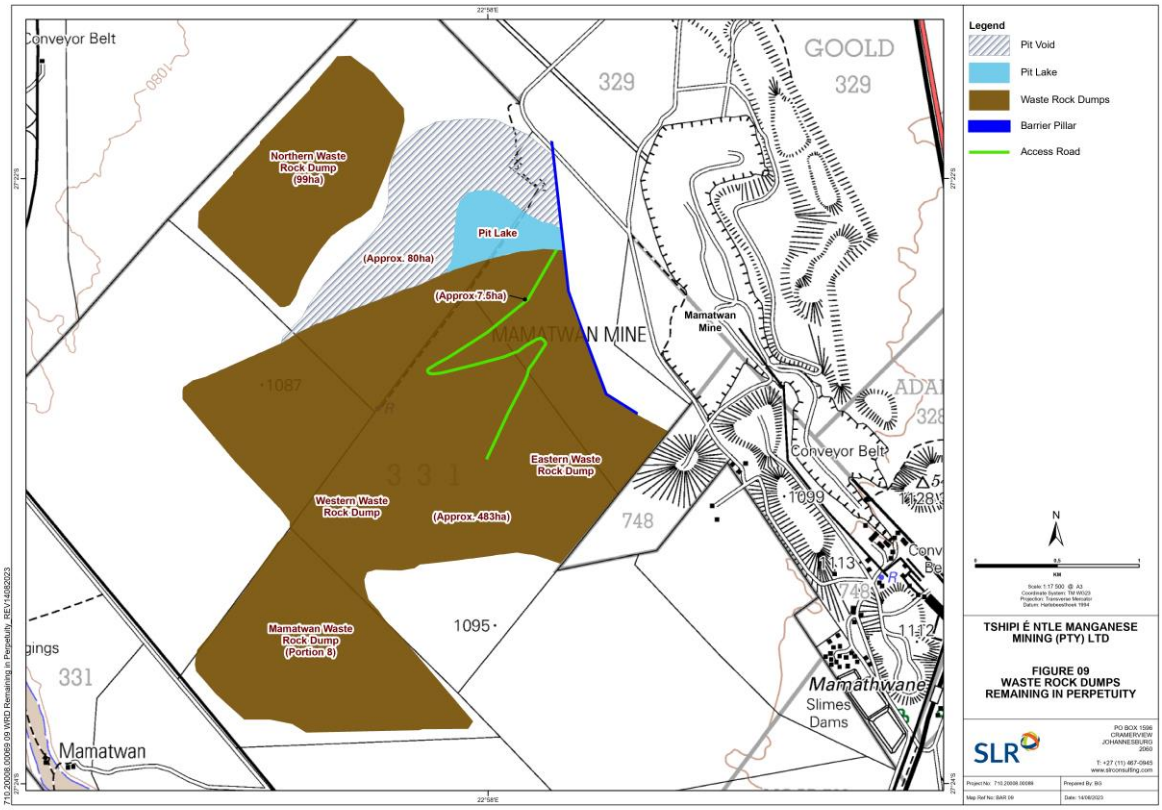


Figure 1 - Proposed closure layout

2. Previous heritage related studies

PGS Heritage and its specialist have conducted numerous HIA and PIA studies for the Tshipi Ntle Mine and surrounds. Listed below an extract of some of the studies conducted.

- 2009 - Heritage Impact Assessment: Ntsimbintle Mining (Pty) Ltd on Portions 1, 2, 3 and 8 of the Farm Mamatwan 331 and the Farm Moab 700 in the Kgalagadi District Municipality of the Northern Cape Province
- 2017 – Heritage Opinion - Heritage Impact Assessment for the Environmental Impact Assessment and Environmental Management Programme Amendment Report for the Tshipi Borwa Mine
- 2018 - Proposed Waste Rock Dump Project at Tshipi Borwa Mine, Near Hotazel, Northern Cape Province. Phase 1 – Heritage Impact Assessment.
- 2019 - Palaeontological Desktop Assessment for the Proposed Waste Rock Dump Project at Tshipi Borwa Mine, Near Hotazel, Sahra CaseID: 12573
- 2019 - Request for exemption from a Heritage Impact Study: Mamatwan Mine Waste Rock Dump Extension, Hotazel, Joe Morolong Local Municipality, Northern Cape Province.
- 2019 - An 18m Wide (On Surface) Boundary Is Located Between The Mamatwan Mine And The Tshipi Borwa Mine. Tshipi and Mamatwan Mine Have Approval to Mine the 18m Wide Boundary Pillar. Additional Capacity Is Required to Store Waste Rock Generated as part of Mining the Boundary Pillar. To cater for The Additional Storage, it is proposed that the Mamatwan Sinterfontein and the Tshipi eastern waste rock dumps are merged to fill the void between the two dumps. MMT is proposing on amending their approved EMP to cater for the merging of the waste rock dumps- Case Id: 13652

Our studies have concluded that no heritage resources were present in the development of the Tshipi mine and the current expansion into the highly disturbed mine infrastructure as well as the proposed changes to the rehabilitation activities as listed in the EMPr will not have impact heritage resources.

Our palaeontological desktop assessments did however identify the possibility of stromatolites present in the mining area. However, it was rated as having a very low possibility and mining activities will have a low probability of impacting on the palaeontological resources of the area.

3. Conclusions and Recommendations

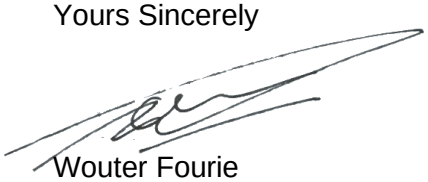
With regard to the proposed process, the following recommendations are made:

1. The findings of the HIAs concluded confirmed that no impacts on heritage resources are foreseen. Our observation and considered opinion on this remains.
2. The palaeontological studies conducted observed that, but it is considered that existing activities at the Tshipi Borwa Mine, near Hotazel, Northern Cape is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

It is thus our opinion and recommendation and opinion that the proposed amendments to the EMPr should be exempted from any further heritage or palaeontological studies.

Should you have any queries, please contact Wouter Fourie (email: wouter@pgsheritage.com; Tel: (012) 332 5305).

Yours Sincerely



Wouter Fourie
Accredited Professional Archaeologist (ASAPA)/Accredited Professional Heritage Practitioner (APHP)
PGS Heritage (Pty) Ltd

RECOMMENDATION FOR EXEMPTION FROM PALAEONTOLOGICAL IMPACT STUDIES: PROPOSED ALTERNATIVE POST-CLOSURE STRATEGY FOR THE TSHIPI BORWA MINE: AGRI-PROCESSING, NEAR HOTAZEL, NORTHERN CAPE PROVINCE

CASEID: 22297

Issue Date: **4 October 2023**
Revision No.: v0.02

Declaration of Independence

I, Elize Butler, declare that –

General declaration:

- I act as the independent palaeontological specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting palaeontological impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected a palaeontological specialist in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

PALAEONTOLOGICAL CONSULTANT: Banzai Environmental (Pty) Ltd

CONTACT PERSON: Elize Butler

Tel: +27 844478759

Email: elizebutler002@gmail.com

SIGNATURE: 

EXECUTIVE SUMMARY

Banzai Environmental was appointed by SLR Consulting (Africa) (Pty) Ltd to write an Exemption from Palaeontological Impact Studies: for the proposed Alternative Post-Closure Strategy for the Tshipi Borwa Mine: Agri-processing, near Hotazel, Northern Cape Province. This study was commissioned by SAHRA as no Palaeontological Impact Assessment has been conducted for the current project.

During the life of the Tshipi Borwa Mine numerous Environmental Impact Assessments (EIA's) were conducted, all of which obtained the necessary authorizations by relevant Departments. Palaeontological Assessments conducted as part of previous EIA processes all indicated that existing activities at the Tshipi Borwa Mine, near Hotazel, Northern Cape is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

This document is thus a recommended exemption from further Palaeontological studies as the greater Hotazel area is not fossiliferous.

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1 INTRODUCTION

Tshipi é Ntle Manganese Mining (Pty) Ltd (Tshipi) currently operates the Tshipi Borwa open pit manganese mine located on the farms Mamatwan 331 (mining right and surface use areas) and Moab 700 (surface use area), approximately 18 km south of Hotazel in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province. Tshipi is also located within the Gamagara Development Corridor, which is a Key Focus Area for economic growth, as outlined in the municipal Integrated Development Plan and Spatial Development Framework[1].

The approved EMPr commits Tshipi to restore the surface to pre-mining state of wilderness and grazing and requires that the open pit is completely backfilled with overburden placed on waste rock dumps during mining operations. Recent optimisation investigations indicate that when considering environmental, socio-economic, technical, commercial and legal factors, completely backfilling the open pit is sub-optimal as a closure solution and an alternative closure and rehabilitation strategy focusing on[1]:

- Managing the closure of mines in an integrated and sustainable manner, ensuring that mines located within the same geographical regions work together to achieve self-sustaining ecosystems and alternate land uses after closure.
- Ensuring mines do not impact negatively on the sustainability of adjacent mines.
- Making provision for post-closure stewardship and socio-economic sustainability, to continue monitoring the implementation of individual and regional mine closure plans.
- Integrating environmental management and related closure activities with socio-economic interventions and aligning these with development of a post-closure economy, by reducing duplication of efforts and spending and aggregating available funding for coordinated regional Projects.

Tshipi is therefore proposing to change the current closure commitment to achieve a more sustainable and optimised outcome. In this regard, the proposed project focusses on:

- Concurrent backfill (in-pit dumping) during mining operations only;
- Backfilling and profiling of a portion of the waste rock back into the open pit as part of a partial backfill scenario;
- Sloping and rehabilitation of waste rock dumps remaining on surface, concurrent with mining operations;
- Removal of infrastructure and preparation of the site for final rehabilitation and closure;
- Cessation of dewatering activities to allow for the development of the proposed pit lake;
- Rehabilitation of any remaining WRDs (which did not form part of the operational phase concurrent rehabilitation);

- Maintenance, aftercare and monitoring of final landforms (rehabilitated areas, WRDs, partially backfilled pit and pit lake;
- Future access to readily available water supply in a pit lake; and
- Optimisation of the surface landforms and partially backfilled pit from an Environmental, Social and Governance (ESG) -focussed perspective [1].

It follows that the proposed closure land use objective is to create a sustainable closure land use which is aimed at enhancing ESG factors through the repurposing of infrastructure and use of natural assets (water and land) to achieve a positive economic, social and environmental legacy [1].

SLR Consulting (Africa) (Pty) Ltd (SLR), an independent firm of environmental assessment practitioners (EAP), has been appointed by Tshipi to manage the environmental authorisation processes[1].

[1]SLR Consulting (Africa) (Pty) Ltd

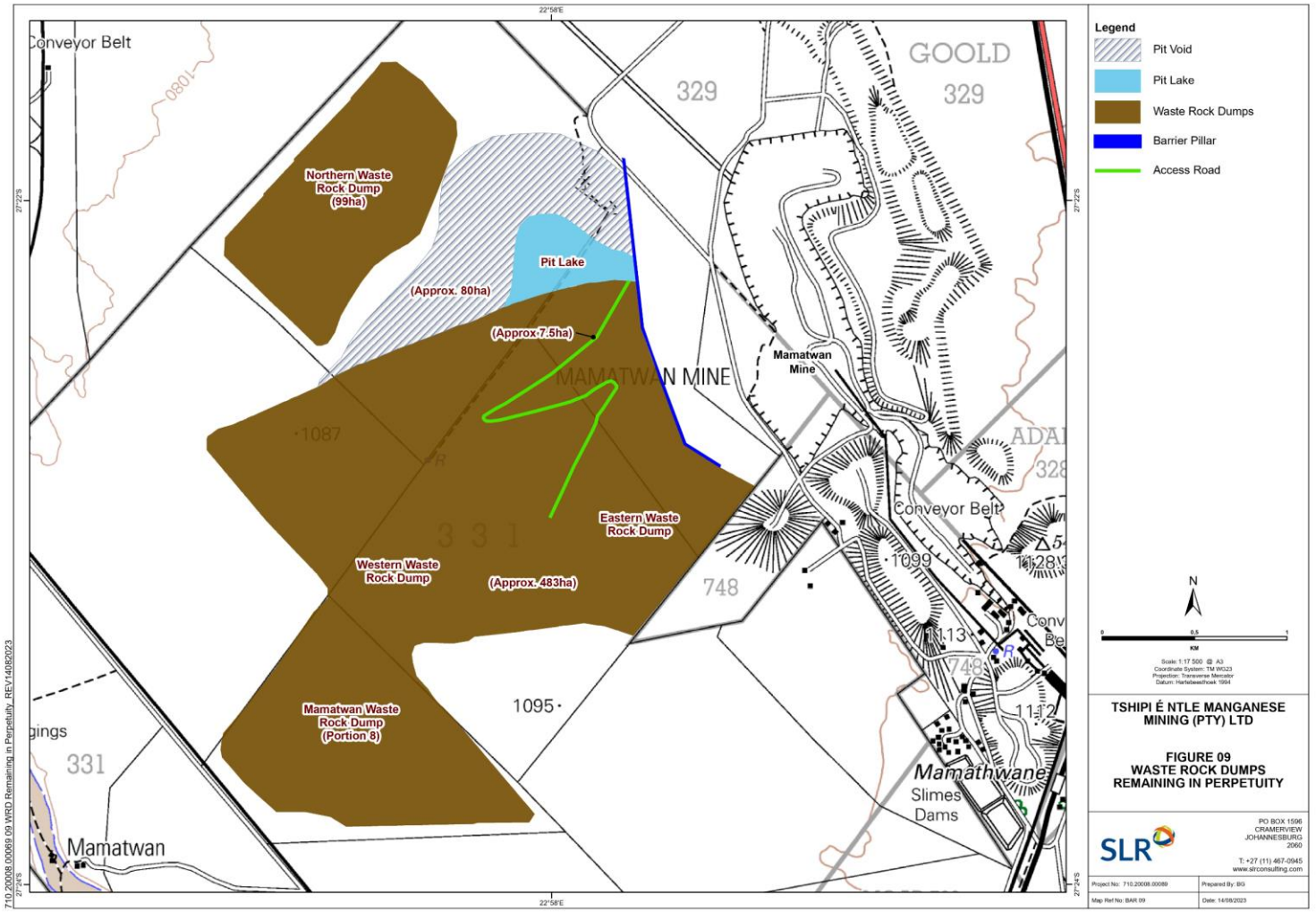
Legend
Pit Void
Pit Lake
Waste Rock Dumps
Barrier Pillar
Access Road
Northern Waste Rock Dump (99ha)
Pit Lake
(Approx. 80ha)
(Approx. 7.5ha)
Mamatwan Mine
MAMATWAN MINE
Eastern Waste Rock Dump
Western Waste Rock Dump
(Approx. 483ha)
Mamatwan Waste Rock Dump (Portion 8)
Conveyor Belt
GOOLD
329
331
748
1095
1099
1087
Mamatwan
Mamathwane Slimes Dams
N
TSHIPI É NTLE MANGANESE MINING (PTY) LTD
FIGURE 09
WASTE ROCK DUMPS REMAINING IN PERPETUITY
SLR
PO BOX 1596
CRAMERVIEW
JOHANNESBURG
2060
T: +27 (11) 467-0945
www.slrconsulting.com
Project No: 710.20008.00069
Prepared By: BG
Map Ref No: BAR 09
Date: 14/08/2023

Figure 1: Local setting of proposed project at the Tshipi Borwa open pit manganese mine, near Hotazel, Northern Cape. Map provided by SLR.

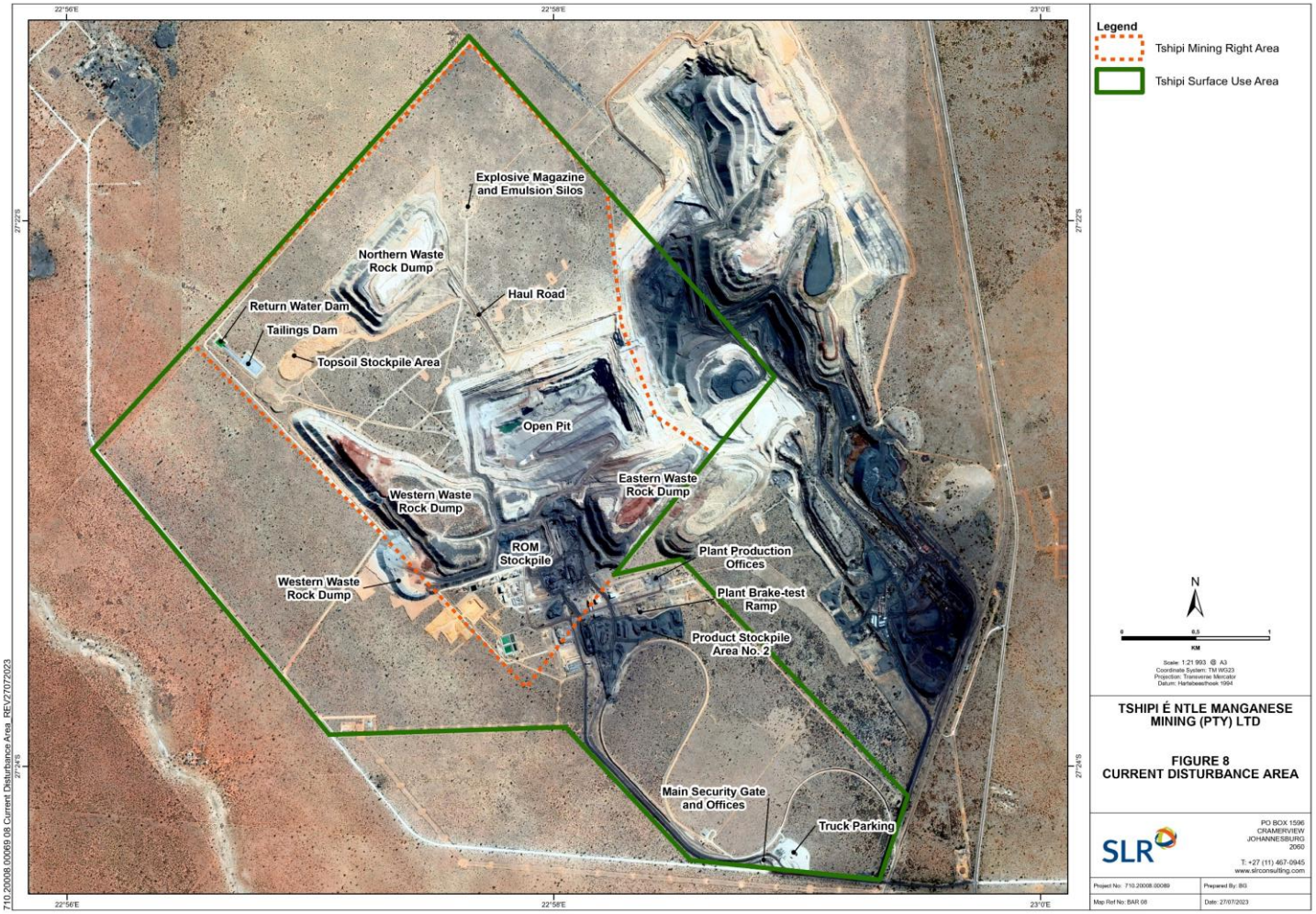

Figure 2: Current Disturbance Area of the Tshipi Borwa open pit manganese mine showing the surface use area, near Hotazel, Northern Cape

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2 QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

The author (Elize Butler) has an MSc in Palaeontology from the University of the Free State, Bloemfontein, South Africa. She has been working in Palaeontology for more than twenty-four years. She has extensive experience in locating, collecting and curating fossils, including exploration field trips in search of new localities in the Karoo Basin. She has been a member of the Palaeontological Society of South Africa for 12 years. She has been conducting PIAs since 2014.

3 LEGISLATION

3.1 National Heritage Resources Act (25 of 1999)

Cultural Heritage in South Africa, includes all heritage resources, is protected by the National Heritage Resources Act (Act 25 of 1999) (NHRA). Heritage resources as defined in Section 3 of the Act include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**".

Palaeontological heritage is unique and non-renewable and is protected by the NHRA. Palaeontological resources may not be unearthed, moved, broken or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

This Palaeontological Desktop Assessment forms part of the Heritage Impact Assessment (HIA) and adhere to the conditions of the Act. According to **Section 38 (1)**, an HIA is required to assess any potential impacts to palaeontological heritage within the development footprint where:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- the construction of a bridge or similar structure exceeding 50 m in length;
- **any development or other activity which will change the character of a site— (exceeding 5 000 m^2 in extent**; or
- involving three or more existing erven or subdivisions thereof; or
- involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- the re-zoning of a site exceeding 10 000 m² in extent;

- or any other category of development provided for in regulations by SAHRA or a Provincial heritage resources authority.

4 GEOLOGICAL AND PALAEONTOLOGICAL HISTORY

The Tshipi Borwa open pit manganese mine is completely underlain by the Cenozoic Kalahari Group as well underlying Griqualand West Basin rocks, Transvaal Supergroup. Various assessments have been conducted over the years in the Hotazel area and some is referenced in the reference list. According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Kalahari Group is low and the Griqualand West rocks of the Transvaal Supergroup is moderate.

The Cenozoic Kalahari Group is the most widespread body of terrestrial sediments in southern Africa. The Cenozoic sands and calcretes of the Kalahari Group range in thickness from a few metres to more than 180m (Partridge et al., 2006). The youngest formation of the Kalahari group is the Gordonia Formation which is generally termed Kalahari sand and comprises of red aeolian sands that covers most of the Kalahari Group sediments. The pan sediments of the area originated from the Gordonia Formation and contains white to brown fine-grained silts, sands and clays. Some of the pans consist of clayey material mixed with evaporates that shows seasonal effects of shallow saline groundwaters. Quaternary alluvium, aeolian sands, surface limestone, silcrete, and terrace gravels are also included in the Kalahari Group (Kent 1980).

Partridge *et al*., (2006) describes numerous types of superficial deposits of Late Caenozoic (Miocene to Pliocene to Recent) age throughout the Karoo Basin. Sands and gravel in the development footprint has a possible fluvial origin.

The fossil assemblages of the Kalahari are generally very low in diversity and occur over a wide range and thus the palaeontological diversity of this Group is low (SAHRIS website). These fossils represent terrestrial plants and animals with a close resemblance to living forms. Fossil assemblages include bivalves, diatoms, gastropod shells, ostracods and trace fossils. The palaeontology of the Quaternary superficial deposits have been relatively neglected in the past. Late Cenozoic calcrete may comprise of bones, horn corns as well as mammalian teeth. Tortoise remains have also been uncovered as well as trace fossils which includes termite and insect's burrows and mammalian trackways. Amphibian and crocodile remains have been uncovered where the depositional settings in the past were wetter.

Hotazel is located in the Griqualand West Basin, Northern Cape Province which consists of clastic sediments as well as volcanic rocks, diamictites and banded iron formations (Table 1). Manganese deposits is present in the Hotazel Formation, upper Postmasburg Group (approximately 2222 Ma). The Vryburg Formation is the basal unit and overlies unconformably

the granite and rocks of the Ventersdorp Supergroup. The Campbell Group overlies the Vryburg Formation and consists of the Schmidtsdrif Formation and the upper Ghaap Plateau Formation. The Griquatown Group is divided into two formations namely the Asbestos Hills and Koegas Formations.

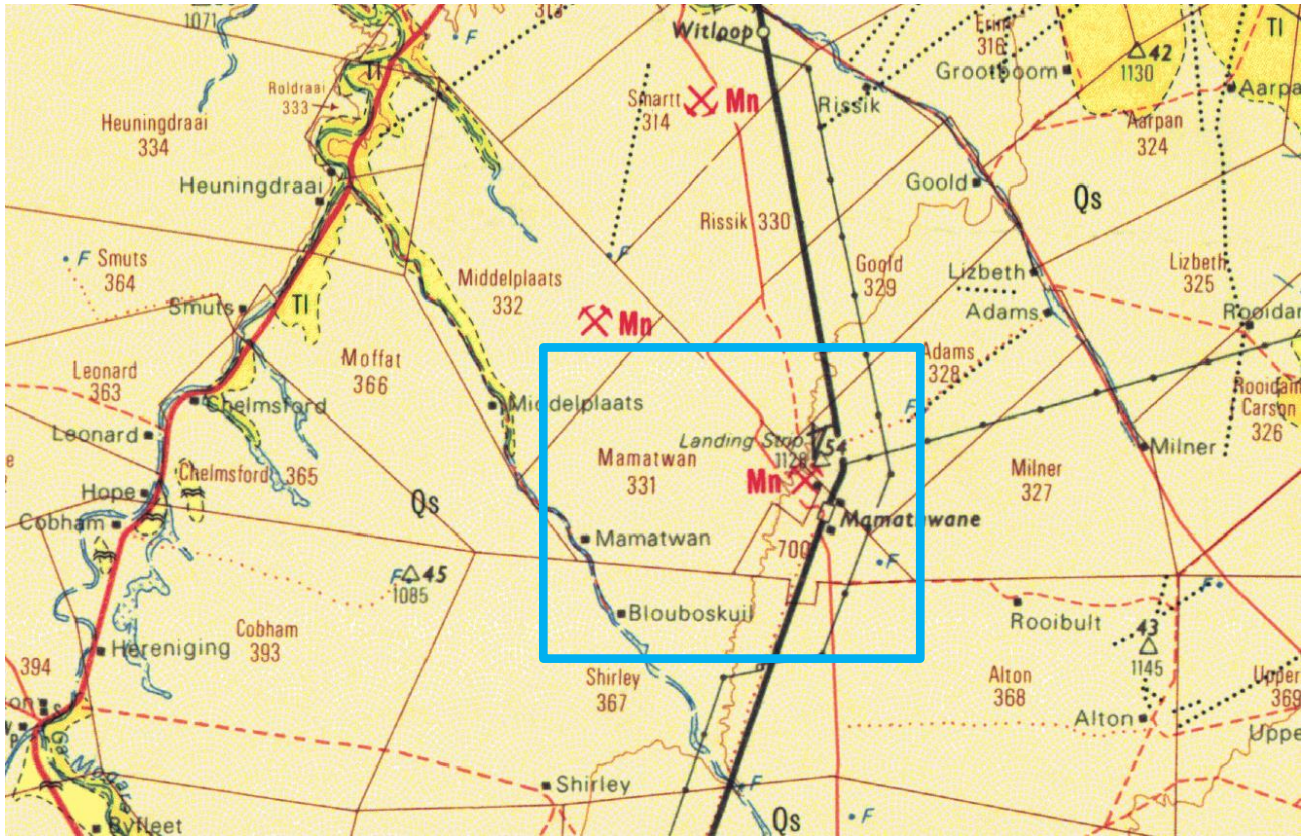

Figure 3: Extract of the 1:250 000 Kuruman geological map 2722 (Council for Geoscience, Pretoria) indicating the approximate position of the Tshipi Borwa open pit manganese mine, near Hotazel, Northern Cape (indicated in blue)*, in the John Taolo Gaetsewe District Municipality, Hotazel, Northern Cape.*

Legend to Map and short explanation.
Qs – Red to flesh-coloured wind-blown sand (beige). Kalahari Group. Quaternary.
Mining activity Manganese

The Gamagara Formation follows and is positioned on the Maremane Anticline, and is overlain by the Makganyene Formation. The Cox Group comprises of the lower Ongeluk Formation and the upper Voëlwater Formation. The Ongeluk Formation was deposited under water and reaches a thickness of between 400 and 900 m. This Formation is basal and is mainly volcanic (Visser 1989). Manganese is present in the upper Voëlwater Formation (Snyman 1996). According to Kent (1980) and Snyman (1996) Griqualand West Basin attains a maximum thickness of 4500 m.

Algal growth structures, also known as Stromatolites, are fossil structures described from the dolomites of the Transvaal Supergroup (Figure 3). Stromatolites are layered mounds, columns and sheet-like sedimentary rocks. These structures were originally formed by the growth of layer upon layer of cyanobacteria, a single-celled photosynthesizing microbe. Cyanobacteria are prokaryotic cells (simplest form of modern carbon-bases life). Stromatolites are first found in Precambrian rocks and are known as the earliest known fossils. The oxygen atmosphere that we depend on was generated by numerous cyanobacteria photosynthesizing during the Archaean and Proterozoic Era.

Figure 4: Example of a well-preserved stromatolite from the Archaean Era.

Almond & Pether 2008 allocated a low significance to the Kalahari Group because fossil assemblages are generally rare and low in diversity and occur over a wide-ranging geographic area. In the past palaeontologists did not focus on Cenozoic superficial deposits although they sometimes comprise of significant fossil biotas. However, Groenewald and Groenewald (2014) allocated a high palaeontological sensitivity to the Cenozoic aged terrestrial organisms which are important indicators of palaeoenvironmental conditions.

Table 1: Generalised Stratigraphic Column and Associated Geology

<table>
<tr><th colspan="3">Stratigraphy</th><th colspan="2">Lithology</th></tr>
<tr><td colspan="3">Kalahari Formation (Qs and Q)</td><td colspan="2">Clay, limestone and sand</td></tr>
<tr><td rowspan="8">Transvaal Supergroup</td><td rowspan="8">Postmansburg Group</td><td rowspan="8">Voëlwater Subgroup</td><td rowspan="7">Hotazel Formation</td><td>Iron Formation</td></tr>
<tr><td>Upper Mn ore body</td></tr>
<tr><td>Middle Mn ore body</td></tr>
<tr><td>Iron Formation</td></tr>
<tr><td>Lower Mn ore body</td></tr>
<tr><td>Mn-rich iron formation</td></tr>
<tr><td>Iron Formation</td></tr>
<tr><td>Ongeluk Formation</td><td>Basaltic lava</td></tr>
</table>

Table 2: Table modified from Palaeotechnical Report (Almond and Pether 2009).

Subgroup/ sequence	Group	Formation	Fossil Heritage	Comment
Tertiary-Quaternary	Kalahari		Terrestrial organisms	Trace fossils, ostracods, bivalves, gastropod shells, diatoms, bones horn corns, mammalian teeth, Tortoise shells
Griqualand West Super Group	Campbell	Ghaapplato (Vgh)	Stromatolites	Cyanobacterial microfossils are present
	Griquastad	Asbestos Hills	Stromatolites	Cynanobacterial microfossils are present

5 GEOGRAPHICAL LOCATION OF THE SITE

The Tshipi Borwa open pit manganese mine is located on the farms Mamatwan 331 (mining right and surface use areas) and Moab 700 (surface use area), approximately 18 km south of Hotazel in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

6 FINDINGS AND RECOMMENDATIONS

The Tshipi Borwa open pit manganese mine Northern Cape is completely underlain by the Cenozoic Kalahari Group as well underlying Griqualand West Basin rocks, Transvaal Supergroup. According to the PalaeoMap of South African Heritage Resources Information System, the Palaeontological Sensitivity of the Kalahari Group is low and the Griqualand West rocks of the Transvaal Supergroup are moderate.

During the life of the Tshipi Borwa Mine numerous Environmental Impact Assessments (EIA's) were conducted, all of which obtained the necessary authorizations by relevant Departments. Palaeontological Assessments conducted as part of previous EIA processes all indicated that existing activities at the Tshipi Borwa Mine, near Hotazel, Northern Cape is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area.

This document is thus a recommended exemption from further Palaeontological studies as the greater Hotazel area is not fossiliferous.

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