PALAEONTOLOGICAL EXEPMTION LETTER FOR THE PROPOSED DMS UPGRADE PROJECT AT THE SISHEN MINE, GAMAGARA LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

I

Issue Date: **03 February 2019**
Revision No.: v0.1
Client: EXM Advisory Services (Pty) Ltd
PGS Project No: 365 PIA

PGS HERITAGE
+ 27 (0) 12 332 5305 | +27 (0) 86 675 8077 | contact@pgsheritage.co.za | PO Box 32542, Totiusdal, 0134

Offices in South Africa, Kingdom of Lesotho and Mozambique

Head Office:
906 Bergarend Streets
Waverley, Pretoria,
South Africa

Directors: HS Steyn, PD Birkholtz, W Fourie

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: 

ACKNOWLEDGEMENT OF RECEIPT

Report Title	**Palaeontological Exemption Letter for the proposed DMS Upgrade Project at the Sishen Mine, Gamagara Local Municipality, Northern Cape Province**		
Control	**Name**	**Signature**	**Designation**
Author	Elize Butler		Palaeontologist
Reviewed			Principal Heritage Specialist
Client			

CLIENT: EXM Advisory Services (Pty) Ltd.

CONTACT PERSON: Ms. Kerry Colleen Fairley

EXECUTIVE SUMMARY

Heritage (Pty) Ltd was appointed by EXM Advisory Services (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment (HIA) for the proposed DMS Upgrade Project at the Sishen Iron Ore Mine, Sishen, Gamagara Local Municipality, Northern Cape Province.

The South African Heritage Resources Agency (SAHRA) requested a Letter of Recommendation for Exemption as part of the Environmental Assessment and thus Banzai Environmental was appointed by PGS Heritage (Pty) Ltd to conduct the Palaeontological Assessment. The Kathu region is mainly underlain by the continental sediments of the Late Cenozoic of the Kalahari Group. These deposits in the Kathu area are mostly low in palaeontological sensitivity although certain areas with a high sensitivity may occur.

The planned development is located in an area which has been utilized by mining and mining related activities since 1953 and is thus situated in a highly disturbed area. **It is therefore recommended that exemption from further specialist palaeontological studies and mitigation be granted for this development pending the discovery of new fossil remains.**

In the event that fossil remains are discovered during any phase of construction, either on the surface or unearthed by fresh excavations, the Environmental Control Officer (ECO) in charge of these developments ought to be alerted immediately. These discoveries should be protected, preferably *in situ,* and the ECO must report to South African Heritage Resources Agency (SAHRA) so that proper mitigation (recording, collection) can be carried out by a professional paleontologist.

.

TABLE OF CONTENT

1 INTRODUCTION 1

1.1 Technical Project Description 1

2 LEGISLATION 4

2.1 National Heritage Resources Act (25 of 1999) 4

3 GEOLOGICAL AND PALAEONTOLOGICAL HISTORY 4

4 GEOGRAPHICAL LOCATION OF THE SITE 7

5 FINDINGS AND RECOMMENDATIONS 7

6 REFERENCES 7

1 INTRODUCTION

1.1 Technical Project Description

Project description supplied by EXM Advisory Services (Pty) Ltd.

The Sishen Mine is an existing mining operation (Figure 1 and 2), which has been in operation since 1953 with the main focus being the beneficiation of A-grade ore (haematite containing >58% iron) by means of Dense Media Separation (DMS). Since 2006, the inclusion of a JIG plant has allowed for B-grade material (haematite containing >48% iron) also to be processed. All other material originating from the run of mine (low grade material) has been placed on site as residue dumps or stockpiles due to the absence of suitable beneficiation process available to process the low-grade ore.

The proposed project consists of the upgrading of the existing DMS processing plant at Sishen Mine to implement new technology (UHDMS) for the processing of lower grade ores (previously considered to be waste).

The infrastructure include:

- Upgrading to DMS Plant Buildings (no footprint change)
- Development by New Primary Crusher
- Development of a New Transfer Conveyor from the New Primary Crusher to an existing conveyor
- Upgrade or discard conveyor
- Development of a new conveyor t new emergency stockpile
- Development of new conveyor to link components within the existing buildings in the plant.

This report must be read in conjunction with the Heritage Impact Assessment conducted for the proposed development by PGS Heritage:

Birkholtz, P. 2018. Heritage Impact Assessment-Proposed DMS Upgrade Project at the Sishen Mine,

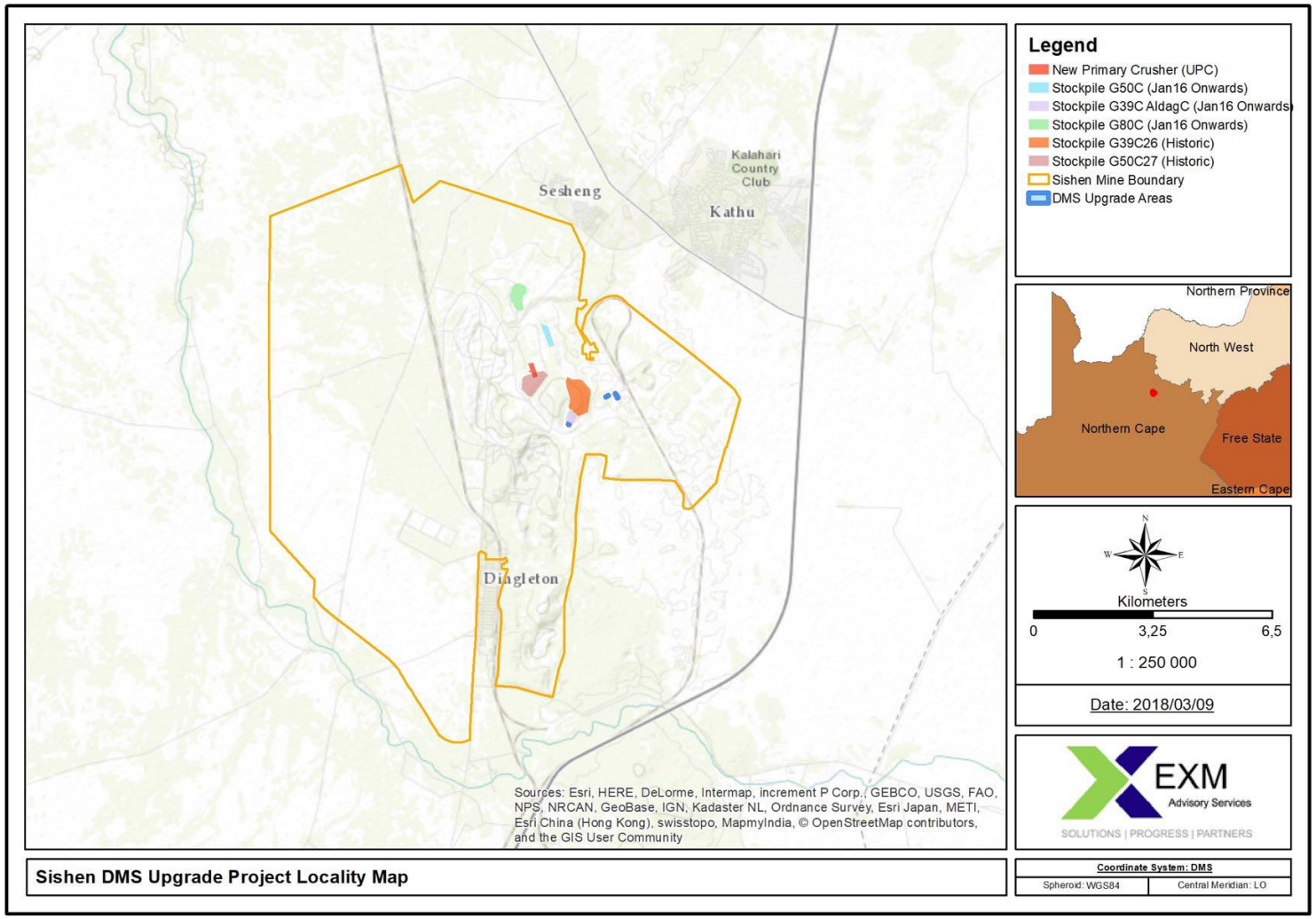

Figure 1 – Sishen Upgrade Project. (Map provided by EXM Advisory Services).

Figure 2. Google Earth Image (Image date, 2019) of the Sishen Upgrade Project. Scale bar represent 1173 m.

2 LEGISLATION

2.1 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 m^2 in extent;
- or any other category of development provided for in regulations by SAHRA or a Provincial heritage resources authority.

3 GEOLOGICAL AND PALAEONTOLOGICAL HISTORY

The Kathu region is mainly underlain by the continental sediments of the Late Cenozoic of the Kalahari Group (Figure 3). These deposits in the Kathu area are mostly low in palaeontological sensitivity although certain areas with a high sensitivity may occur.

Kalahari Group

The Cenozoic Kalahari Group is the most widespread body of terrestrial sediments in southern Africa. 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. Superficial deposits comprising gravels, clays, sandstone, silcrete, calcrete and aeolian sand. The poorly studied pan sediments of the Kalahari Group 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 ground waters.

Cenozoic Superficial Deposits of the Kalahari Group

The fossil assemblages of the Kalahari are generally very low in diversity, and occur over a wide range and thus the palaeontological diversity of the development area is low. It is important to note that the study area may contain Late Cenozoic calcrete which 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.

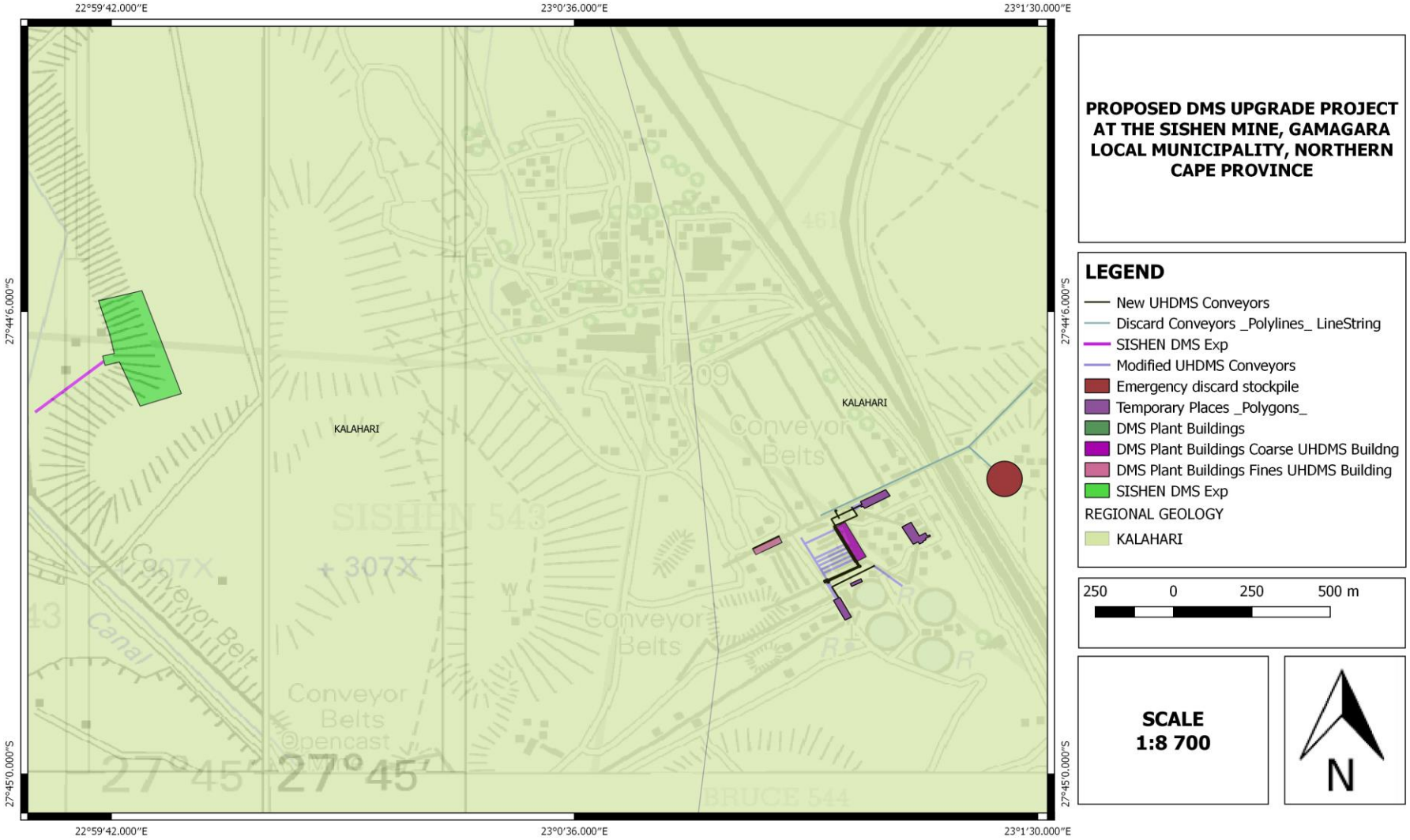

Figure 3. Surface geology of the proposed proposed DMS Upgrade Project at the Sishen Iron Ore Mine, Sishen, Gamagara Local Municipality, Northern Cape Province. The proposed development is entirely underlain by the Kalahari Group. Map drawn by QGIS Desktop 2.18.18.

4 GEOGRAPHICAL LOCATION OF THE SITE

The proposed DMS Upgrade Project at the Sishen Iron Ore Mine is located approximately 4.8 km south west of Kathu and approximately 5.5 north east of Dingleton.

5 FINDINGS AND RECOMMENDATIONS

The Kathu region is mainly underlain by the continental sediments of the Late Cenozoic of the Kalahari Group. These deposits in the Kathu area are mostly low in palaeontological sensitivity although certain areas with a high sensitivity may occur.

The planned development is located in an area which has been utilized by mining and mining related activities in the past and is a highly disturbed area. **It is therefore recommended that exemption from further specialist palaeontological studies and mitigation be granted for this development**

6 REFERENCES

ALMOND, J.E. 2014. Residential development on Remainder and portion 3 of Farm Bestwood RD 459 in Kathu, Gamagara Municipality, Northern Cape Province. Palaeontological specialist assessment, 33 pp. Cape Town. Natura Viva cc.

ALMOND, J.E. & PETHER, J. 2008. Palaeontological heritage of the Northern Cape. Interim SAHRA technical report, 124 pp. Natura Viva cc., Cape Town.

ALMOND, J., PETHER, J., and GROENEWALD, G. 2013. South African National Fossil Sensitivity Map. Fossil Heritage Layer Browser, SAHRA and Council for Geoscience.

BIRKHOLTZ, P. 2018. Heritage Impact Assessment-Proposed DMS Upgrade Project at the Sishen Mine.

DU TOIT, A. 1954. The geology of South Africa. xii + 611pp, 41 pls. Oliver & Boyd, Edinburg.

JOHNSON, M.R., VAN VUUREN, C.J., VISSER, J.N.J., COLE, D.I., De V. WICKENS, H., CHRISTIE, A.D.M., ROBERTS, D.L. & BRANDL, G. 2006. Sedimentary rocks of the Karoo Supergroup. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 461-499. Geological Society of South Africa, Marshalltown.

KENT, L. E., 1980. Part 1: Lithostratigraphy of the Republic of South Africa, South West Africa/Namibia and the Republics of Bophuthatswana, Transkei and Venda. SACS, Council for Geosciences, Pp 535-574.

MCCARTHY, T & RUBIDGE, B. 2005. *The Story of Earth Life: A southern African perspective on a 4.6-billion-year journey.* Struik. Pp 333

MACRAE, C. 1999. Life etched in stone. *Fossils of South Africa*. 305 pp. The Geological Society of South Africa, Johannesburg.

PATRIDGE, T.C., BOTHA, G.A. and HADDON, I.G. 2006. Cenozoic deposits of the interior. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J. (Eds). The geology of South Africa, pp 585-604. Marshalltown. Geological Society of South Africa.

SNYMAN, C.P. 1996. Geologie vir Suid-Afrika, Departement Geologie, Universiteit van Pretoria, Pretoria, Volume 1, Pp 513.