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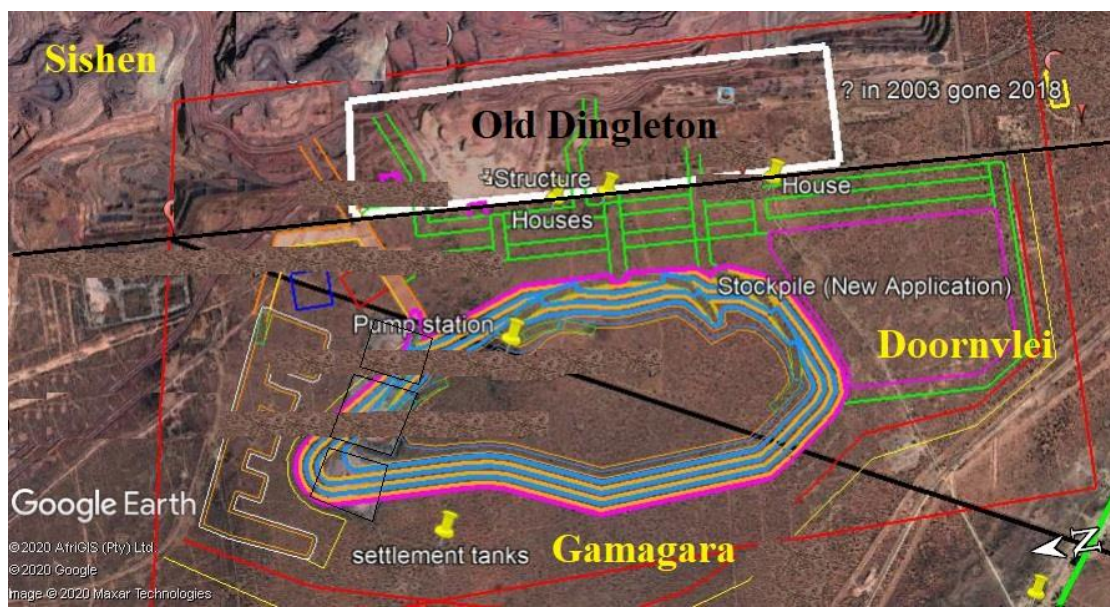
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**1<sup>st</sup> phase H.I.A. of a proposed extension and upgrading at Sishen Mine, also known as phase two of the Sishen Western Expansion Project that is located on portions of Gamagara and Doornvlei, Northern Cape**

For Sishen Mine

**Project ANG-SIS-20-02-24**



**Project coordinator:** - Shangoni management services. *(For contact details see page 4.)*



**Report prepared by: -**

**Date. November 2020.**

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### 1.1. Location and GPS Coordinates of the study area.



**Fig. 01.** This image shows the location of the study area. The red line indicates the extent of the area investigated. (Google Earth 2020.)

### 1.2. G.P.S. Coordinates of the limits of the site under assessment.

Beacon	Degrees south	Degrees east	Beacon	Degrees south	Degrees east
1	27°45'34.34"S	22°57'15.40"E	2	27°45'59.77"S	22°59'29.88"E
3	27°49'9.39"S	22°59'21.27"E	4	27°49'6.13"S	22°57'18.17"E

**Fig. 02.** Above table shows G.P.S. coordinates that are defining the study area. 1 being the top left corner and then in clockwise order. (GPS coordinates from Google Earth.)

### 1.3. Description of the site.



**Fig. 03.** Birds-eye image of the extent of the Sishen Mine. (Wikipedia.).

The Sishen Iron Ore Mine commenced in 1946, later to become part of an export project via a new railway line to Saldanha Bay. Initially it was located on the farm Sishen, but during its more than seventy years of existence it expanded to include Kathu, Sacha, Simms, Gamagara, Doornvlei Sekgame, Bruce and Lylyveld. Owing to the rich iron ore deposits other mines such as the one at Beeshoek as well as other smaller operations followed in the general region

The present project is not for ore extraction, but for a proposed new stockpile that is proposed to be located directly west of the old Sishen (Dingleton) town on the farms Doornvlei and Gamagara.

## 2. Contact Details.

### 2.1. Client.

**Sishen Mine**

Contact Person: Environmental Manager Sishen mine. Nadia Williams

E-mail address [nadia.williams@angloamerican](mailto:nadia.williams@angloamerican)

### 2.2. Consultants.

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**Shangoni Management Services.**

**Physical address.**

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**Postal address.** PO Box 74726, Lynnwood Ridge, Pretoria, 0040.

**Contact person.**

Minnette Le Roux.

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**Heritage.**

**Sidney Miller.**

**Physical address.**

328 Malherbe Street, Capital Park, 0084, Tshwane.

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**Contact person.**

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### 2.3. Type of Development.

Mining.

### 2.4. Zoning of Site.

Mining.

### **3. Executive Summary.**

#### **3.1. Mandate of Shangoni Management services.**

Shangoni's mandate is to procure a first phase heritage impact assessment of their client's proposed impact on the study area described above. The proposed impact is the placement of an extensive stockpile on the farms Doornvlei and Gamagara to the west of the old Sishen Town.

#### **3.2. Intent of Sishen Mine.**

It is the intent of the client to place an extensive stockpile on the farms Doornvlei and Gamagara to the west of the old Sishen Town.

#### **3.3 The project description.<sup>1</sup>**

The present project is not for ore extraction, but for a new stockpile that is proposed to be located directly west of the old Sishen (Dingleton) town on the farms Doornvlei and Gamagara.

#### **3.4. Historical milieu.<sup>2</sup>**

**A.** The general area is known to contain both Early as well as Later Stone Age sites as well as engraving sites. The nearby Kathu Pan is a good example of these early people's presence in the area under investigation. No significant assemblages of Stone Age (either Early, Middle or Later) artefacts were observed. Neither were there any engravings or other rock art panels observed.

*The proposed stockpile and associated infrastructure will have no impact on Stone Age archaeological sites or material.*

**B.** In the general area the only known Iron Age sites is those situated more to the north and east of Kuruman the area investigated revealed no indication of Iron Age settlement.

*The proposed stockpile and associated infrastructure will have no impact on Iron Age archaeological sites or material.*

**C.** On the area investigated the recycled remains of most of the old Sishen (Dingleton) Town was observed. The demolition process was initiated circa 2003 and a few final buildings are in the process of being demolished. On places located in the historical recording in section 8 remains of a pump station, sludge dams and settlement tanks were observed. The sludge dams have no heritage value, and the other two structures have long ago been stripped of machinery employed. Further recording will have no impact on their heritage value.

*The proposed stockpile and associated infrastructure will have no impact on historical sites or material.*

**D.** There are no sites of cultural/spiritual significance located on or near the property under investigation.

**E** There are no sites connected to slavery located on or near the property under investigation.

**F.** There are no people of importance connected to the history of the study area.

**G.** There is no special technological or scientific advancement of standing that can be linked to the property under investigation.

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<sup>1</sup> E-mail from Shangoni (Minnette le Roux). Monday 24<sup>th</sup> February 2020.

<sup>2</sup> For full description see chapter 8.



### **3.5. Environmental milieu.<sup>3</sup>**

**Geology.** The geology of the Northern Cape is possibly of the best known in the world owing to its diamondiferous nature especially around the Kimberley area and the Iron Ore deposits lying between Postmansburg, Kuruman and Kathu. The extended deposit of limestone in the general area is also well-known. These limestone deposits accrued from the leaching of dolomite structures and or the deposit from large masses of aquatic bodies caused either directly or indirectly by living organisms and their skeletal remains.

The tectonostratigraphy at Sishen reflects a fault-controlled basin or sub-basin, dominated by the Ghaap and Postmansburg Groups of the Transvaal Supergroup, the Gamagara/Mapedi Formation of the Olifantshoek Supergroup and the Karoo Supergroup.

**Vegetation.** The site under investigation is located at one veld type, namely zone 16. Acocks describes this as Kalahari Thornveld, (Acocks, 1988.)

### **3.6. Summary of findings.**

Owing to the character of the ecology (geology, vegetation and precipitation) of the region it has always been a harsh environment for humans to settle in on a long-term basis. Access to water was through drainage lines that were seldom permanent and through pans. This has limited the sparse settlement to the banks of larger perennial rivers and larger pans such as the Kathu Pan. This reality was then also reflected in the absence of archaeological and historical finds in the survey.

### **3.7. Recommendation.**

*According to the requirements of the National Heritage Act, there is no reason why the proposed stockpile cannot be placed as indicated on the site plan.*



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<sup>3</sup> *For full description see chapter 7.*

#### **4. Definitions.**

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of paleontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

#### **5. Protected Sites in Terms of the National Heritage Act, Act no 25 of 1999.<sup>4</sup>**

The following are the most important sites and objects protected by the National Heritage Act:

- a. Structures or parts of structures older than 60 years
- b. Archaeological sites and objects
- c. Paleontological sites
- d. Meteorites
- e. Shipwrecks
- f. Burial grounds
- g. Graves of victims of conflict
- h. Public monuments and memorials
- i. Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette
- j. Any other places or object which are considered to be of interest or of historical or cultural significance
- k. Geological sites of scientific or cultural importance
- l. Sites of significance relating to the history of slavery in South Africa
- m. Objects to which oral traditions are attached
- n. Sites of cultural significance or other value to a community or pattern of South African history

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<sup>4</sup> *For the present study the highlighted lines are applicable.*

## **6. Methodology.**

**6.1.** The study area was visited between the 28th of October and the 1<sup>st</sup> of November 2020.

**6.2.** Owing to the scale of mining operations, the intensity of safety regulations and the availability of personnel that is qualified and certified to escort visitors to the site, it is rather difficult to follow traditional methods of assessment. No private vehicles are allowed on the mining premises.

**6.3.** On the first day the consultant was accompanied by the engineer responsible for the design of the proposed new work, an assistant in the environmental office, and the safety officer/driver of the official vehicle.

The high ground to the northeast of the area was first visited and then the eastern side. As the vehicle was not equipped to enter the area to be impacted it was decided that a 4x4 vehicle will be made available on the following day.

**6.4.** On the second day the consultant was accompanied by the person responsible for land management and rehabilitation of stockpiles that will not be used again, and the safety officer/driver of the official vehicle.

With their normal access to and knowledge of the area under investigation the area was thoroughly investigated, especially the old slimes dams, and a disused pumping facility.

**6.5.** It was clear that the farm/s were in fact impacted upon in the past during mining, but no sign of farming or other human activities were found.

**6.6.** Finds were recorded by GPS readings and photography.

**6.7.** The above information was recorded and collated in section 9 of this report.

**6.8.** Background information concerning the geology and vegetation of the region was collected from reliable resources and is presented in section 7 of this report.

**6.9.** Background information concerning the archaeology and historical milieu of the region was collected from reliable resources (especially from previous heritage impact assessments available) and is presented in section 8 of this report.

**6.10.** In sections 10 and 11 field ratings (SAHRA minimum standards May 2007) and statements of significance (SAHRA minimum standards May 2007) were attributed as necessitated by situation.

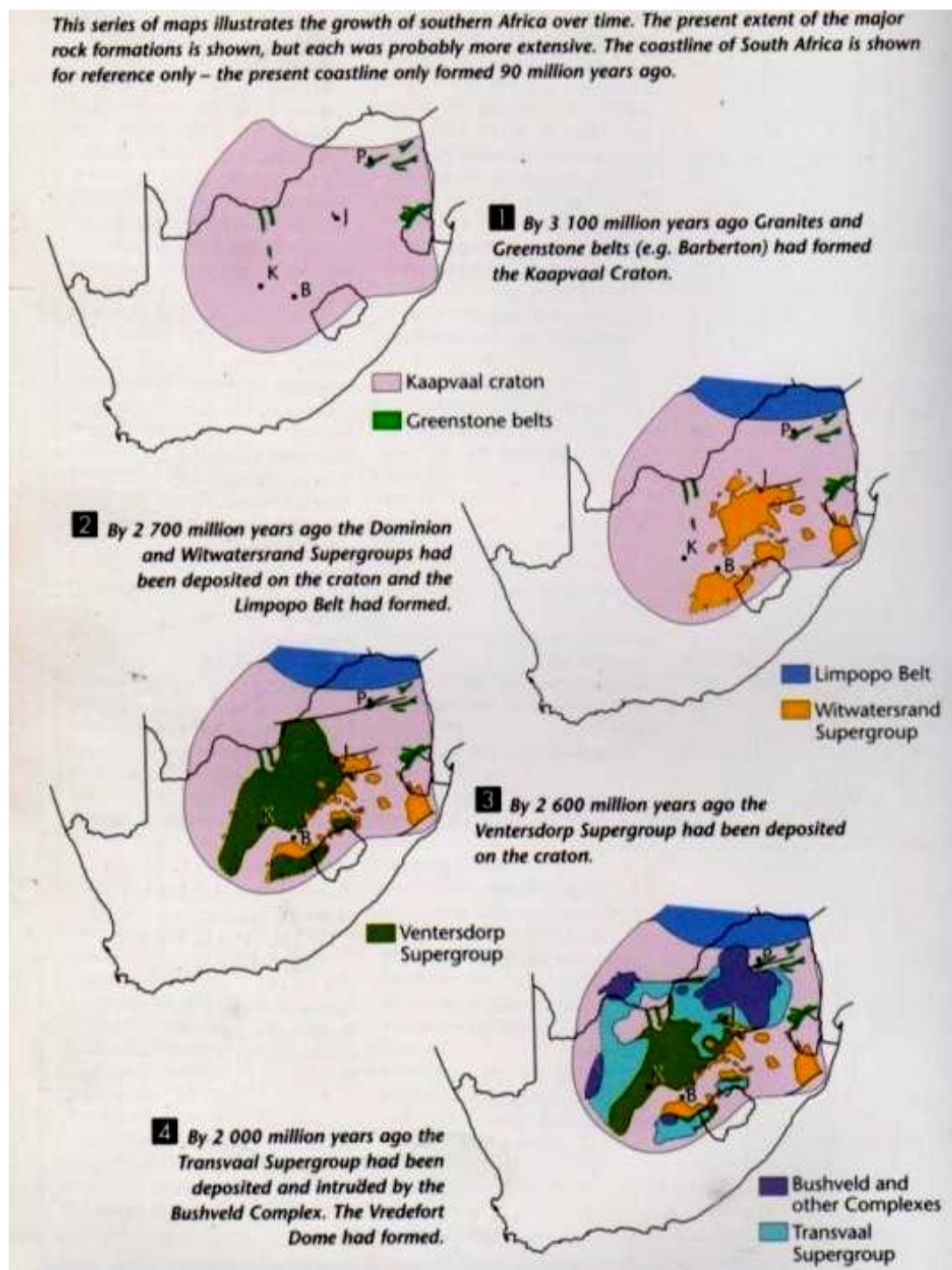
**6.11.** Section 12 contains a summary of the research results with a recommendation in section 13.

**6.12.** The collective gist of the information collated in the report is summarised in the executive summary in section 3.



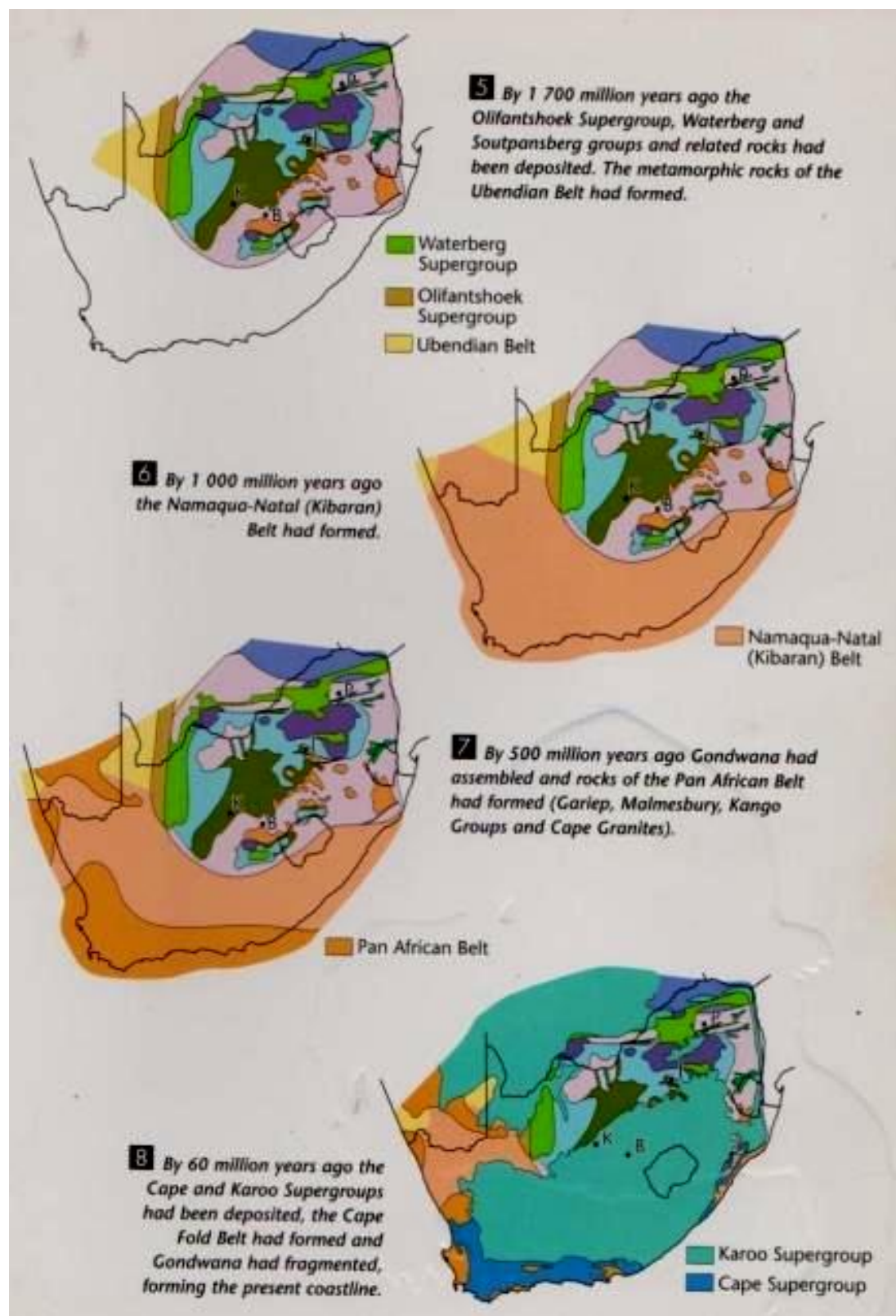
## 7. Environment.

### 7.1. Geology.<sup>5</sup>



**Fig. 04.** Above is illustrated the formation of the South African geological substructure between 3100 million years ago and 2000 million years ago. In our present study area, the Kaapvaal Craton had formed and the Transvaal Supergroup had been deposited. The Bushveld Complex had appeared and the Vredefort meteorite impact had occurred. K in the illustration's marks Kimberly, adjacent to the study area. (McCarthy & Rubidge: 334.)

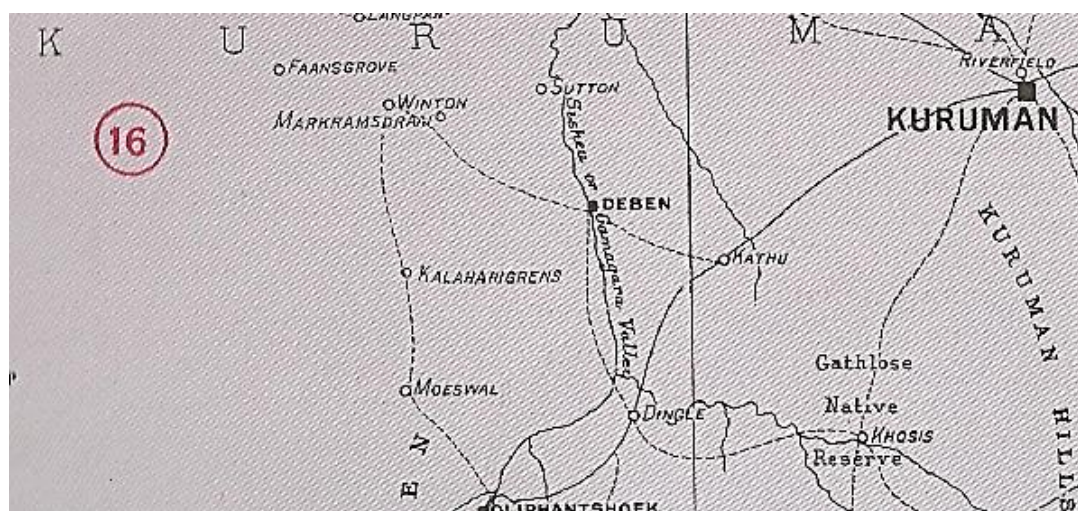
<sup>5</sup> See McCarthy & Rubidge 2005 and Haughton 1940 for full description.



**Fig. 05.** Above is illustrated the formation of the South African geological substructure between 2000 million years ago and 60 million years ago. As can be seen above it is only the Karoo Supergroup that had any further significant impact on the study area. K, in the illustrations, marks Kimberly. (McCarthy & Rubidge: 335.)



## 7.2. Vegetation.



**Fig. 06.** The site under investigation on the farms Gamagara and Doornvlei is located at the heartland of veld type zone 16. Acocks describes this as Kalahari Thornveld. (Acocks, 1988.)<sup>6</sup>

### 7.2.1. Type 16. Kalahari Thornveld. (Acocks, pp44.)

According to Acocks there are two different types in this category. 16a is Kalahari Thornveld Proper and 16b represents the Vryburg Shrub Bushveld. Both these are again subdivided in several categories.

The present study area fits best in category 3 of the Kalahari Thornveld Proper. This is called “Central Form” and it extends from Hopetown to Kimberly and onwards to Vryburg This is essentially an *Acacia erioloba* - Savannah with some of the grasses of the Dry *Cymbopogon - Themeda* veldt and some of those in the Western Form. Rainfall is only about 400 mm per annum so that the veld has not been disturbed by ploughing as such. The “purple grasses” of the Dry *Cymbopogon - Themeda* veldt have fallen out except *Themeda* and have been replaced by the white grasses of the Kalahari. *Themeda* however is the natural dominant, which mainly distinguishes it from the Western Form, even though it is to be found today, as dominant, only on exceptionally well cared farms. Further overgrazing will in turn cause the “white grasses” to be replaced entirely by uniform growth of *Schmidtia pappophoroides*; this change can happen quite suddenly, in a few years. *Pentzia incana* and *Chtysocoma ciliate* are steadily invading, and today these Karoo bushes will be more important than they were 14 years ago when the daughter about this veldt were collected. Dominant trees and shrubs are as follows: - *Acacia tortillus*, subsp, heteracantha, *Lucium cinerium*, *Diospyros pallens*, *Rhus ciliate* *Grewia flava*, *Lycium hirsutum*, *Tarchonanthus camphorates*, *Ziziphus mucronata*, *Acacia erioloba*, *Acacia mellifera* subsp, detinens, *Protoasparagus laricinus*, *Acacia hebeclada* subsp, hebeclada and *Ehretia rigida*.

The grasses on the other hand are extremely abundant. Acocks lists in his relative abundance table at least 270 species. It is a rich flora, with the forbs and annuals playing an important role. The cover, however, is sparse, the grasses being tall and tufted. *Gregeria ornativa* is relatively scarce; other poisonous plants, which may be locally common, include *Gregeria brevifolia*, *Gregeria obtusifolia* and *Urgenia sanguine*.

<sup>6</sup> The author is aware of the updated version of Acocks’s work by Mucina & Rutherford, 2010, but for the purposes of this investigation Acocks version is preferred by the present author.

## 8. Archaeological and Historical Background.

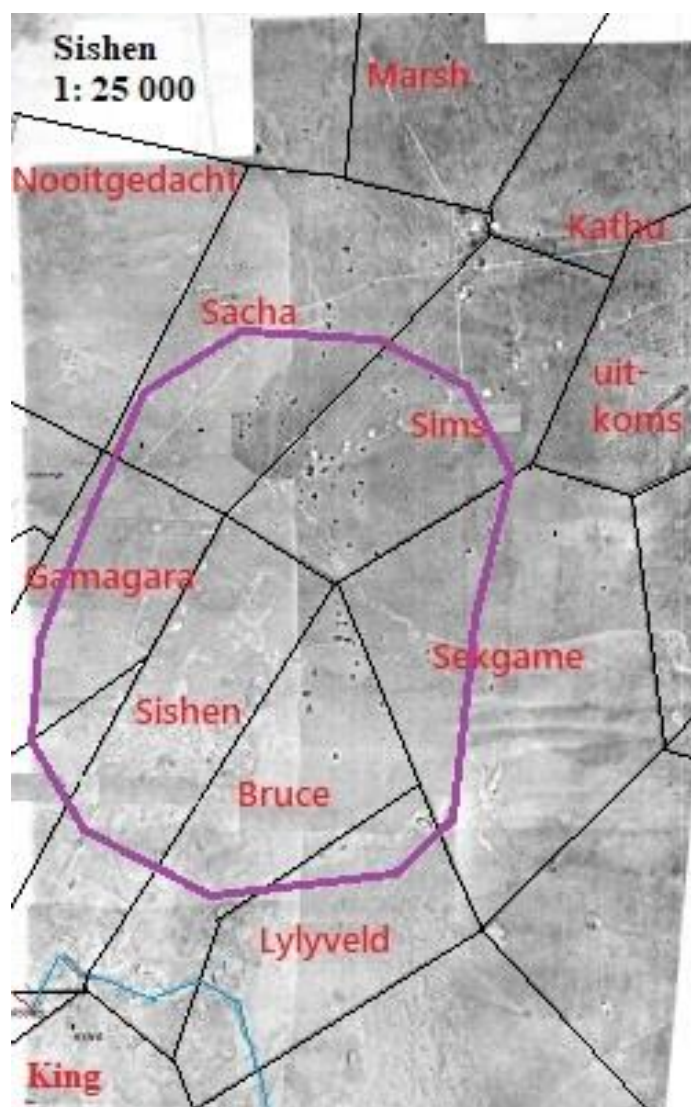
### 8.1. General. (Sishen Mine Cultural Management Plan 2020)

In many ways the area on and around Sishen Mine is one of the best studied regarding heritage resources. This statement can be underpinned by the fact that in his Heritage Management Plan for the mine, dated the 5<sup>th</sup> of October 2020, D v d Merwe lists at least 19 studies completed between 2000 and 2019. This does not include the studies done and permits obtained for the demolition of Sishen (Dingleton) that has been ongoing for many years.

If any reader of this report is interested in the detail of the v d Merwe Heritage Management Plan for Sishen, it can be found at: -

### SISHEN MINE CULTURAL HERITGE MANAGEMENT PLAN 2020

#### 8.2.1. Stone Age.



From the general character of the environment, it is known that for a long time the region was only habitable for longer periods of time along the banks of perineal streams and rivers and around more permanent waterbodies such as pans. These conditions probably also stretched back for a long time, so it is not strange that although scatters of stone tools may be encountered on the surface, in-situ stone tool assemblages are rare, and here one such site is known.

Kathu Pan, also known as Kathu Vlei, is (was) a marshland and ephemeral surface water body fed primarily by artesian seepage. The surface of this pan fluctuates seasonally with the water table, but it has not risen above the ground surface since significant pumping began of the aquifer to supply the town of Kathu. It is located at the convergence of the boundaries of the four farms Marsh 467, Sicha 468, Kathu 466 and Sims 462. (See *fig 08*)

**Fig. 07.** This 1:25 000 aerial image from circa 1950 shows the modern impact (purple line) of the Sishen Mine as a footprint over the original farms. The Kathu Pan Stone Age Site is located at the junction of the farms Marsh, Kathu, Sims and Sicha. (Image supplied by Sishen Mine employee, Hannes Hagar.)

Owing to extraction of the aquifer, the general water-table dropped significantly and a number of sinkholes (dolines) was noticed in the pan deposit.

In 1974 hand-axes and faunal remains were discovered in a six-meter wide and three-meter-deep sinkhole near the homestead of the then farm manager Naas Viljoen. From then on, a number of prominent archaeologists, pollen analysts and dating specialists worked continuously until as recently as 2013.

If any reader of this report is interested in the detail of Kathu report it can be found at

### **KATHU PAN: LOCATION AND SIGNIFICANCE**

#### **8.2.2. Rock Art.**

Regarding rock art associated with Later Sone Age or Iron Age cultures there are none to be found on the site under investigation. The closest engraving site to Sishen is the Wildebeestkuil rock art centre located between Kimberly and Barkley West.



**Fig. 08.** Hand-axe from Kathu Pan Stratum 4b, unit D21 (MCGM-6538-14on left with two other hand-axes from KP! For scale (Photo Michael Chazzan.)

**Regarding the study area it is expected that no SIGNIFICANT Stone Age remains may be encountered.**

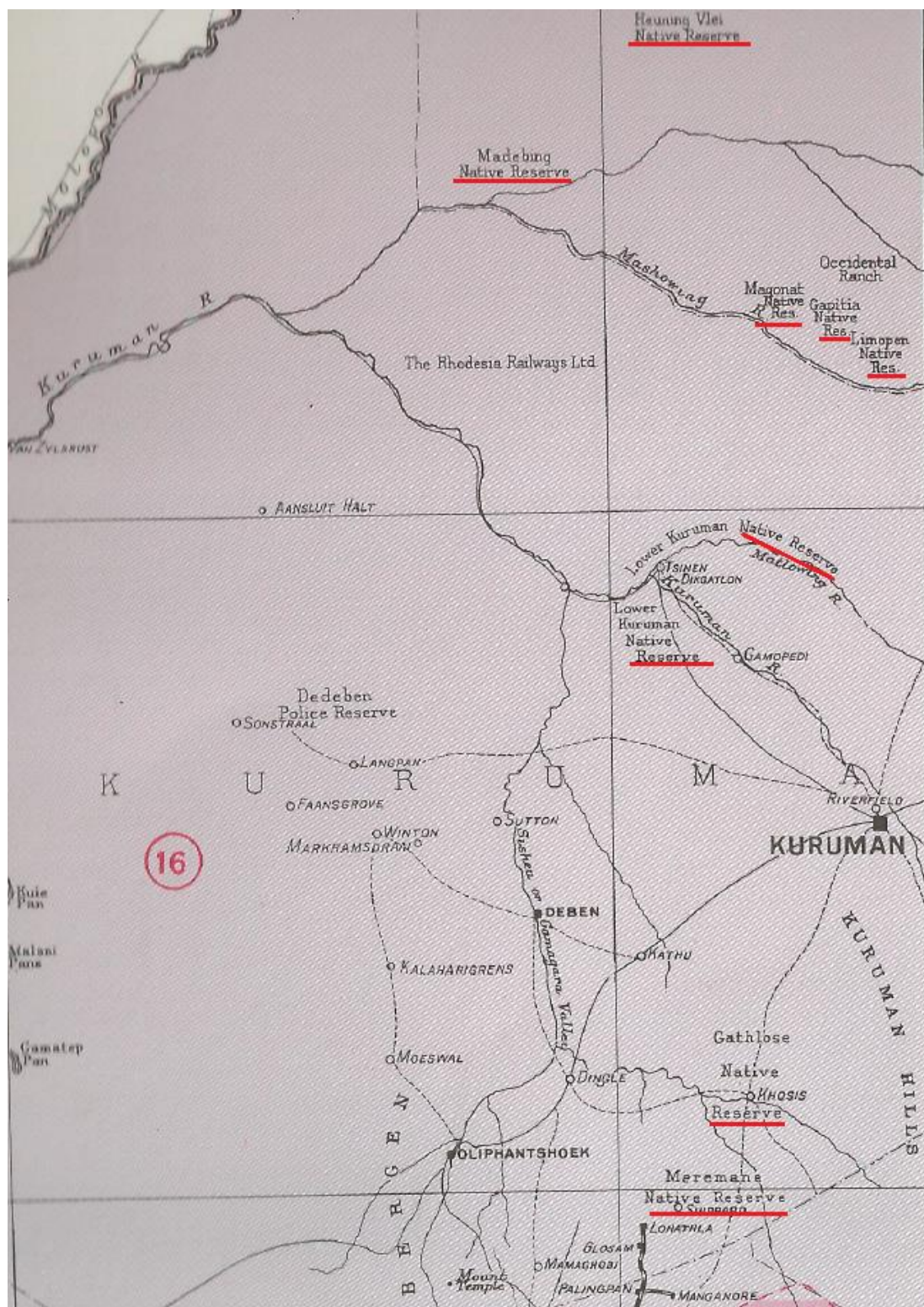
#### **8.3. Iron Age.<sup>7</sup>**

The nature of Iron Age settlement in southern Africa is well understood and well documented. Iron Age settlers were not only users of the natural environment's resources, but they were essentially farmers. They raised stock and also planted crops that needed specific environmental conditions such as summer rainfall and soils suited for cultivation. Owing to the large tracts of "suitable environmental conditions" land available to the north, northeast and southeast of this region during their migrations, they seldom utilized this region.

Even having noted the above, it was specifically owing to the presence of large numbers of Agropastoralists that travelers such as Burchell and Campbell visited the area in the early eighteen hundreds to open the way for the London Missionary Society. This led to the influential Moffat opening the Kuruman Station and eventually contact with Mzilikazi.

<sup>7</sup> See Huffman 2007.





**Fig. 09.** One of the reasons that the present author prefers to use the Acocks version of the description of vegetation in South Africa is that so much other information is encapsulated in his maps. Here is presented the location of indigenous people, all along the drainage lines where sufficient water was available in a harsh environment. (Acocks, 1988.)

**Regarding the study area it is expected that no Iron Age remains may be encountered.**

#### **8.4. Historical Period.**

The arrival of Europeans in the region was possibly heralded by the notorious Coenraad Buis early in the nineteenth century amongst the Basotho and Batswana to the east and the Northeast. This was soon followed up by missionaries such as Burchell in 1811, Campbell in the 1820's and in May 1821 the notorious Reverend Robert Moffat established himself at Kuruman. Later, in 1834, Moffat accompanied the explorer Smith on his journey to Mzilikazi then living just north of the Magaliesberg along the Crocodile River. Soon after, the Great Trek followed in 1836, and Natal, the Free state and the Transvaal were settled in with various levels of success for the Europeans from the Cape Colony.

In 1866 the *Hopetown Diamond* was found by one Schalk Van Niekerk on the farm of the Boer family named Jacobs, a prospective buyer for the farm, *De Kalk*. In March 1869 Van Niekerk had acquired an 83.5 carats stone from a man named *Swartboo* that became the *Star of South Africa*.<sup>8</sup> These events set in motion the first "Diamond Rush" of 1870 in search of alluvial diamonds in the region with attention being focussed on the drainage lines of the major rivers. The rest is well known history.

Exactly when the area was settled by Europeans is not clear but farms were settled on by the time the large Iron Ore deposits were located. As far as could be established the farmyards of the farms Gamagara Doornfontein and Sishen was always located to the South along the Gamagara River (or rather drainage line).



**Fig. 10.** Although the farmyards of the original farms Gamagara, Doornvlei and Sishen are not per se part of the study area it was investigated on Google Earth imagery. It appears as if it was preferred to be located original homes along the river. (**Google Earth 2020.**)

#### **8.5. Sishen and Dingleton.**

Before the Second South African War mineral extraction in South Africa was focussed on Diamonds, Gold and Coal. After the formation of the Union of South Africa as part of the British Empire it became clear that other minerals would have to be sourced for local and export use.

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<sup>8</sup> See Roberts 1984



By 1919 the Thabazimbi ore body was discovered by J.H Williams and in the 1930's mining operations commenced. In the same period the iron ore deposits of the Postmansburg-Kuruman region were identified, resulting in mining commencing shortly post Second World War.

By 1976 the South African Iron and Steel Corporation had completed the new harbour facilities at Saldanha as well as the 860-kilometre railway linking the mine to the port.

The town Sishen was founded circa 1953 to accommodate the miners and soon grew into a large village with all amenities. By the 1980s the houses were sold to the inhabitants and for reasons unknown the towns name was changed to Dingleton. (If one view the image in **Fig. 09**, an answer may be found in the name "Dingle" that appears to be located midway between "Oliphantshoek" and Kathu.

Owing to a number of reasons it was decided to demolish the old town and resettle its inhabitants in Kathu by subsidy of the Mine.

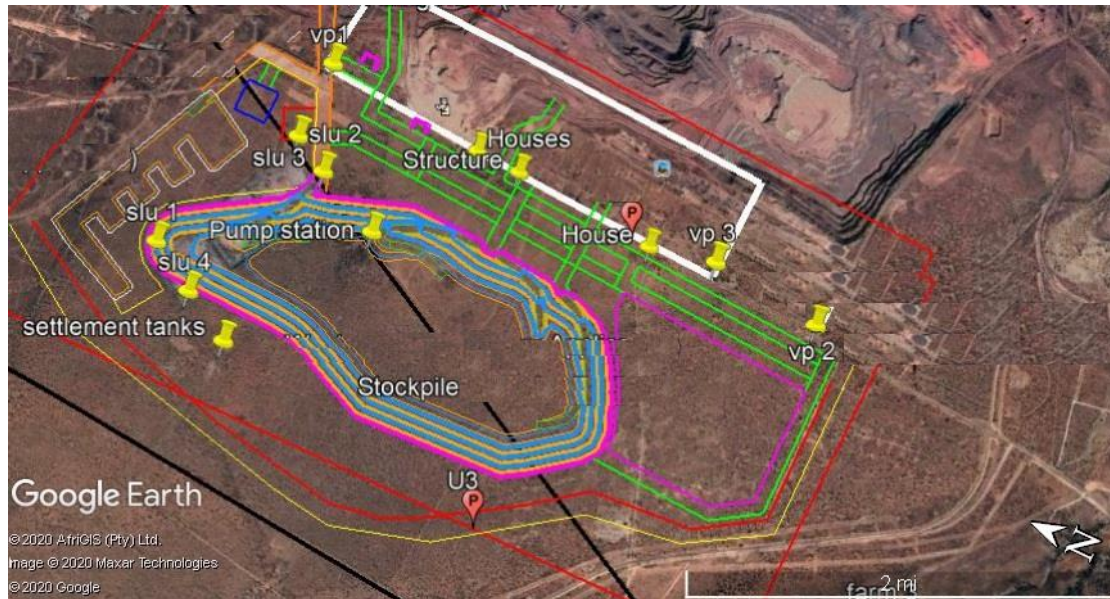


**Fig. 11.** In 2006 Dingleton was still a fully functional town. With the present survey it was found that 99.9 % has been finally demolished. (**Google Earth 2006.**)

**Regarding the study area it is expected that no historical period remains may be encountered.**

## 9. Documentation of Data on the Premises under Investigation.

### 9.1. G.P.S. Coordinates of the position of heritage remains and photos taken.



**Fig. 12.** Map of the area under investigation showing features and points from where photographs were taken. (Google Earth 2020.)

Beacon	Degrees south	Degrees east
Sludge dam 1. (slu 1.)	27°46'14.24"S	22°57'46.51"E
Sludge dam 2. (slu 2.)	27°46'34.01"S	22°58'29.88"E
Sludge dam 3. (slu 3.)	27°46'43.34"S	22°58'23.88"E
Sludge dam 4. (slu 4.)	27°46'26.04"S	22°57'37.79"E
Pump Station.	27°47'0.63"S	22°58'14.47"E
Settlement Tanks.	27°46'39.12"S	22°57'29.45"E
View point 1. (vp1.)	27°46'34.03"S	22°58'52.36"E
View point 2. (vp 2.)	27°48'49.23"S	22°58'43.79"E
View point 3. (vp 3.)	27°48'20.39"S	22°58'47.89"E
House	27°48'3.82"S	22°58'44.25"E

**Fig. 13.** Above table shows the G.P.S. coordinates of the positions from which the photographs were taken. (GPS coordinates from Google Earth 2020.)



**Figs. 14 to 16.** Composite view over the study area looking west from vp 1. (Photos S.M. Miller 2020.)



**9.2. Photographs taken.**



*Fig. 17. Work in progress looking west from vp 1. (Photo S.M. Miller 2020.)*



*Figs. 18 & 19. Typical views looking west from vp 2. (Photos S.M. Miller 2020.)*





***Figs. 20 & 21.** Typical views looking west from vp 3. (Photos S.M. Miller 2020.)*



***Fig. 22.** One of the last demolitions taking place in Dingleton looking east from vp 3. (Photos S.M. Miller 2020.)*





**Fig. 23.** *One of the last inhabited dwellings in Dingleton recorded as “house. (Photo S.M. Miller 2020.)*



**Figs. 24 & 25.** *Typical views of remaining walls of the pump-station. All equipment has been removed and buildings have been vandalised. They have no heritage value. (Photos S.M. Miller 2020.)*



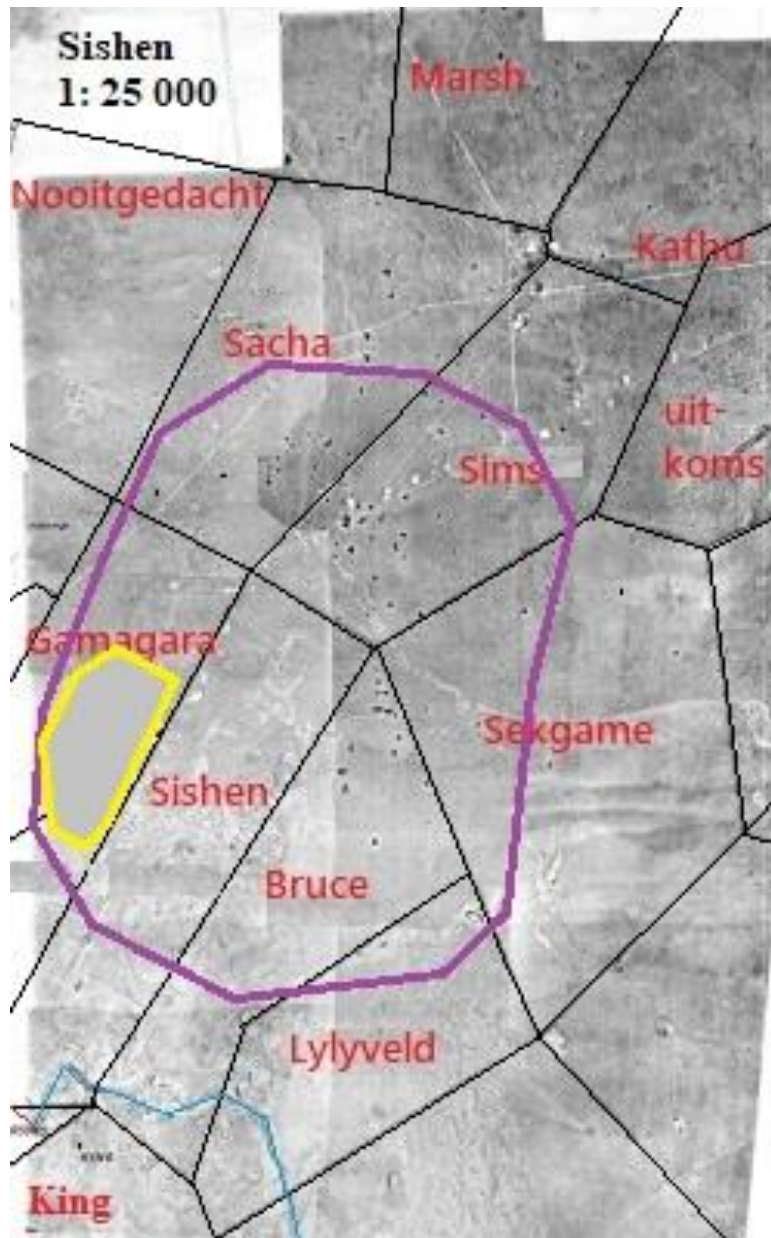


***Figs. 26 to 28. Typical views of remaining walls of the settlement tanks. All equipment has been removed and buildings have been vandalised. They have no heritage value. (Photos S.M. Miller 2020.)***





**Figs. 29 & 30.** Typical views of the three sludge dams. They have no heritage value. (Photos S.M. Miller 2020.)



**Fig. 31.** As can be seen on this image, Sishen Mine has eventually impacted on seven farms. (Purple line.) The present impact area is outlined in yellow. (Image supplied by Sishen Mine employee, Hannes Hagar.)



### **9. 3. Discussion of finds.**

#### **9.3.1.**

The remains of the Dingleton town still in the study area has previously been covered by demolition permits that were obtained.

#### **9.3.2.**

The remains of the pump station have no heritage value and may be demolished without further documentation.

#### **9.3.2.**

The remains of the settlement tanks have no heritage value and may be demolished without further documentation.

**10. Field Rating. (SAHRA minimum standards May 2007.)**

<b>No.</b>	<b>Description</b>	<b>Rating according to minimum standards May 07</b>
<b>1</b>	<b>Remains of Dingleton.</b>	<b>N/A</b>
<b>2</b>	<b>Pump station.</b>	<b>N/A</b>
<b>3</b>	<b>Settlement tanks</b>	<b>N/A</b>

**11. Statements of Significance. (SAHRA minimum standards May 2007.)**

<b>No.</b>	<b>Description</b>	<b>Rating according to minimum standards May 07</b>
<b>1</b>	<b>Remains of Dingleton.</b>	<b>N/A</b>
<b>2</b>	<b>Pump station.</b>	<b>N/A</b>
<b>3</b>	<b>Settlement tanks</b>	<b>N/A</b>

## **12. Summary.**

### **12.1. Mandate of Shangoni Management services.**

Shangoni's mandate is to procure a first phase heritage impact assessment of their client's proposed impact on the study area described above. The proposed impact is the placement of an extensive stockpile on the farms Doornvlei and Gamagara to the west of the old Sishen Town.

### **12.2. Intent of Sishen Mine.**

It is the intent of the client to place an extensive stockpile on the farms Doornvlei and Gamagara to the west of the old Sishen Town.

### **12.3. The project description.<sup>9</sup>**

The present project is not for ore extraction, but for a new stockpile that is proposed to be located directly west of the old Sishen (Dingleton) town on the farms Doornvlei and Gamagara

### **12.4. Historical milieu.<sup>10</sup>**

**A.** The general area is known to contain both Early as well as Later Stone Age sites as well as engraving sites. The nearby Kathu Pan is a good example of these early people's presence in the area under investigation. No significant assemblages of Stone Age (either Early, Middle or Later) artefacts were observed. Neither were there any engravings or other rock art panels observed.

*The proposed stockpile and associated infrastructure will have no impact on Stone Age archaeological sites or material.*

**B.** In the general area the only known Iron Age sites is those situated more to the north and east of Kuruman the area investigated revealed no indication of Iron Age settlement.

*The proposed stockpile and associated infrastructure will have no impact on Iron Age archaeological sites or material.*

**C.** On the area investigated the recycled remains of most of the old Sishen (Dingleton) Town was observed. The demolition process was initiated circa 2003 and a few final buildings are in the process of being demolished. On places located in the historical recording in section 8 remains of a pump station, sludge dams and settlement tanks were observed. The sludge dams have no heritage value, and the other two structures have long ago been stripped of machinery employed. Further recording will have no impact on their heritage value.

*The proposed stockpile and associated infrastructure will have no impact on historical sites or material.*

**D.** There are no sites of cultural/spiritual significance located on or near the property under investigation.

**E** There are no sites connected to slavery located on or near the property under investigation.

**F.** There are no people of importance connected to the history of the study area.

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<sup>9</sup> *E-mail from Shangoni (Minnette le Roux). Tuesday 26 June, 2018*

<sup>10</sup> *For full description see chapter 8.*

**G.** There is no special technological or scientific advancement of standing that can be linked to the property under investigation.

### **12.5. Environmental milieu.<sup>11</sup>**

**Geology.** The geology of the Northern Cape is possibly of the best known in the world owing to its diamondiferous nature especially around the Kimberley area and the Iron Ore deposits lying between Postmansburg, Kuruman and Kathu. The extended deposit of limestone in the general area is also well-known. These limestone deposits accrued from the leaching of dolomite structures and or the deposit from large masses of aquatic bodies caused either directly or indirectly by living organisms and their skeletal remains.

The tectonostratigraphy at Sishen reflects a fault-controlled basin or sub-basin, dominated by the Ghaap and Postmansburg Groups of the Transvaal Supergroup, the Gamagara/Mapedi Formation of the Olifantshoek Supergroup and the Karoo Supergroup.

**Vegetation.** The site under investigation is located at a one veld type, namely zone 16. Acocks describes this as Kalahari Thornveld, (Acocks, 1988.)

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<sup>11</sup> *For full description see chapter 7.*

**13.1. Summary of findings.**

Owing to the character of the ecology (geology, vegetation and precipitation) of the region it has always been a harsh environment for humans to settle in on a long-term basis. Access to water was through drainage lines that were seldom permanent and through pans. This has limited the sparse settlement to the banks of larger perennial rivers and larger pans such as the Kathu Pan. This reality was then also reflected in the absence of archaeological and historical finds in the survey.

**13.2. Recommendation.**

*According to the requirements of the National Heritage Act, there is no reason why the proposed stockpile cannot be placed as indicated on the site plan.*



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### **Guidelines**

- SAHRA. Mar. 2006 and  
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Paleontological Components of Impact Assessment Reports*



## **Appendix 1: Declaration of Independence.**

**I, Sidney Mears Miller (ID 5412135029082) declare that:**  
**I act as an independent environmental practitioner in this application;**  
**I will perform the work relating to the application in an objective manner, even if this result in views and findings that is 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 environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) 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 regulation 8 of the regulations 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 ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;**  
**I will keep a register of all interested and affected parties that participated in a public participation process;**  
**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;**  
**will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations;**  
**I realize that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.**

### **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 AND OR proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations.**



**SIDNEY MEARS MILLER.**

**Appendix 2: Provisional indemnity.**

**Declaration by author.**

I Sidney Miller hereby declare that all reasonable steps were taken to identify the heritage resources on the property under investigation. For obvious reasons heritage remains that occurred underground cannot be vouched for. In the event of such remains being uncovered during the mining operations work should be stopped and a heritage practitioner or the heritage authorities must be informed. The cost of such new investigation will be for the account of the client.



**SIDNEY MEARS MILLER.**

### Appendix 3: Shangani risk and impact table

Aspect affected	Alternatives	Activity	Potential Impact	Reversibility	Irreplaceable loss	Phase	Size and scale of disturbance	Significance pre-mitigation			Mitigation Type	Significance post-mitigation		
								Probability	Magnitude	Significance		Probability	Magnitude	Significance
Sites of Archaeological and Cultural Importance	Waste rock dump and haul alternatives	SWEP Phase 2	For all project phases: No impact to sites of archaeological and cultural importance will occur as a result of the proposed SWEP Phase 2.											

### Shangani mitigation table

Aspect affected	Alternatives	Activity	Potential Impact	Phase	Mitigation type	Impact management actions / Mitigation measures	Impact management outcome/ Standard to be achieved	Time period for implementation	
Sites of Archaeological and Cultural Importance	Waste rock dump and haul alternatives	SWEP Phase 2	For all project phases: No impact to sites of archaeological and cultural importance will occur as a result of the proposed SWEP Phase 2.						