

**PHASE 1 ARCHAEOLOGICAL IMPACT  
ASSESSMENT FOR PROPOSED  
PROSPECTING ON PORTION 2 AND  
THE REMAINDER OF THE FARM  
CROWN HILL 368, NORTH OF  
DANIËLSKUIL, NORTHERN CAPE:  
PRELIMINARY REPORT**

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January 2023

**PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR PROPOSED  
PROSPECTING ON PORTION 2 AND THE REMAINDER OF THE FARM CROWN  
HILL 368, NORTH OF DANIËLSKUIL, NORTHERN CAPE**

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### **Executive Summary**

This is a preliminary report towards a Phase 1 Heritage Impact Assessment based on a visit in company of the proposed prospecting company and team members together with landowners Mr & Mrs du Toit of Kuruman.

Heritage traces located during the survey of one of the valleys on the east side of the Kuruman Hills on Crown Hill farm were largely limited to evidence of historical asbestos prospecting. Krantzes in the valley sides potentially provide very shallow rock shelters where there might be evidence of Stone Age inhabitation – including finger paintings as previously noted further north in this range of hills – but no such traces were found. The valley sides are typified by scree associated with the Banded Ironstone Formation. No stone artefacts were noted during the valley walk-through.

No graves or farm infrastructure were found within the area investigated.

From an archaeological and cultural heritage perspective the observed heritage resources score low in terms of the various significance criteria applied.

On the basis of preliminary findings reported, no mitigation measures are considered necessary. Further parts of the property require to be investigated and it remains possible that small rock shelters may yield traces mentioned above.

If encountered, these may change the provisional low impact assessment.

### **1. Introduction**

This report provides a preliminary Phase 1 Archaeological Impact Assessment for the proposed prospecting on Portion 2 and the Remainder of the farm Crown Hill 368 situated within the Kgatelopele Local Municipality in ZF Mgcawu District Municipality, Northern Cape. The author was approached to conduct this study by MSG Trading (PTY) Ltd (Mr Thabo Tshite, treasurenc@gmail.com) and Mr Emmanuel T. Nkobolo (Pr.Sci.Nat.), Managing Director of ETN Resources (PTY) Ltd (info.etnresources@gmail.com).

Proposed prospecting is to evaluate prospects for mining of iron ore/manganese.

The aim of this Phase 1 impact assessment is to determine the occurrence and nature of archaeological heritage traces or features within the footprint of the proposed prospecting area.

### **1.1 Focus and Content of Specialist Report: Archaeology**

This preliminary report contributes towards a stand-alone Phase 1 Archaeological Impact Assessment report and incorporates the following information:

- » Introduction to the Specialist in terms of qualifications, accreditation and experience to undertake the study (1.2, below)
- » Description of the affected environment (2)
- » Description of heritage features of the region (2.1)
- » Description of issues identified ahead of the study (2.2)
- » Methodology of determining the significance of the impacts and assumptions as well as scoping phase predictions (3)
- » Observations and Assessment of impacts (4)
- » Conclusions (5)

### **1.2 Archaeology Specialist**

The author of this report is an archaeologist accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists, having previously carried out surveys and fieldwork on sites in the region (e.g. Beaumont & Morris 1990; Morris & Beaumont 2004; Morris 2016; Chazan et al. 2017).

The author works independently of the organization commissioning this specialist input, and provides this Phase 1 AIA (archaeology and colonial material culture traces but not palaeontology) within the framework of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act no. 25 of 1999 (NHRA) protects heritage resources which include archaeological and palaeontological objects/sites older than 100 years, graves older than 60 years, structures older than 60 years, as well as intangible values attached to places. The Act requires that anyone intending to disturb, destroy or damage such sites/places, objects and/or structures may not do so without a permit from the relevant heritage resources authority.

Heritage is assessed in terms of a NEMA application, and must comply with section 38(3) of the NHRA. SAHRA would then comment and make recommendations on the potential impacts.

(Where archaeological sites and palaeontological remains are concerned, the South African Heritage Resources Agency (SAHRA) at national level acts on an agency basis for the Provincial Heritage Resources Agency (PHRA) in the Northern Cape. The Northern Cape Heritage Resources Authority (formerly called Ngwao Bošwa ya Kapa Bokone) is responsible for the built environment and other colonial era heritage and contemporary cultural values).

## **2. Description of the affected environment and potential impacts**

The environment in question is the eastern flank of the Kuruman Hills which run north-south through the Kuruman and Daniëlskuil areas. It is situated about 10 km (measuring to the mid-point of the proposed prospecting area) south of Wonderwerk Cave, a Grade 1 National Heritage Site; and 7 km west of the sinkhole and subterranean solution cavity known as Boesmansgat. The landscape within the proposed prospecting footprint consists of deep valleys draining the east side of the Kuruman Hills, with Banded Ironstone Formation (BIF) krantzies and BIF scree, levelling off to a sandy plain stretching eastwards as the Ghaap Plateau. Sparse vegetation renders any archaeological traces at the surface highly visible.

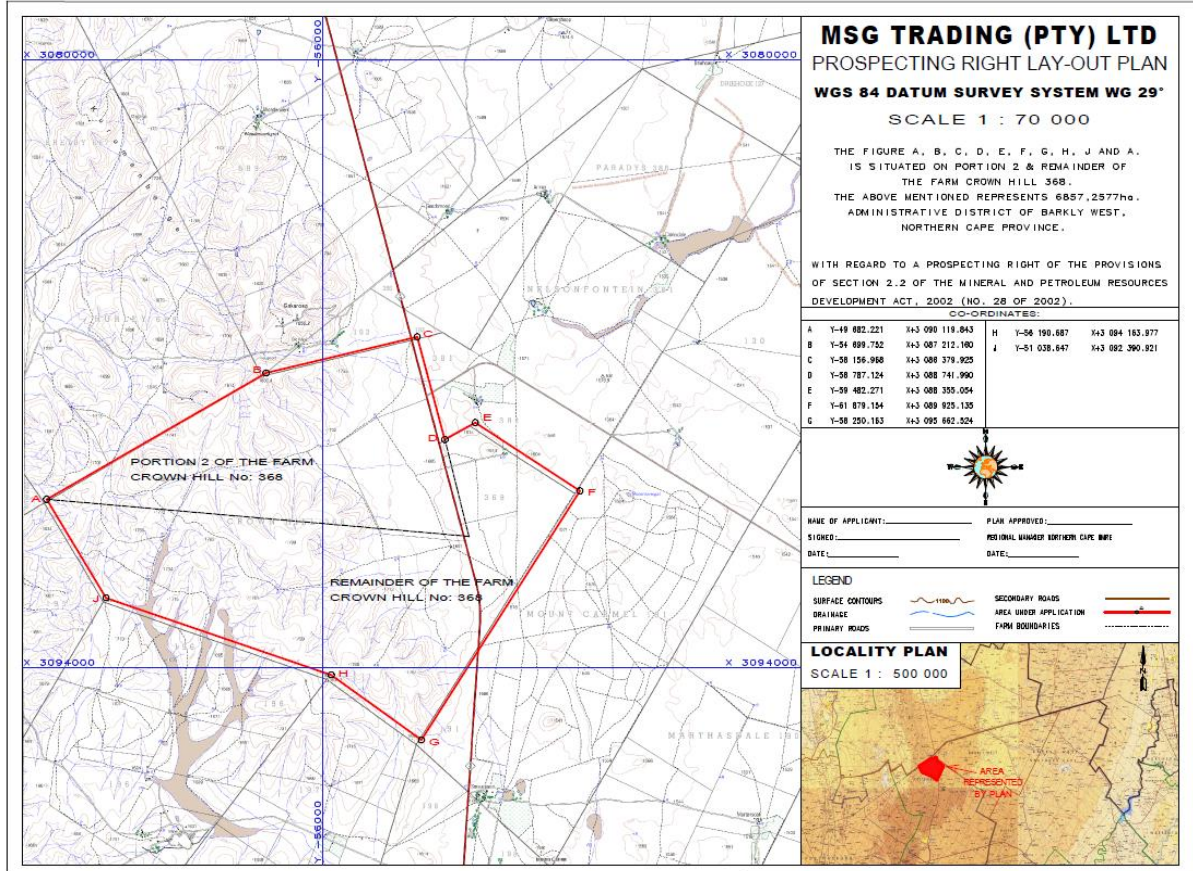


Figure 1. Location of farm north of Daniëlskuil.

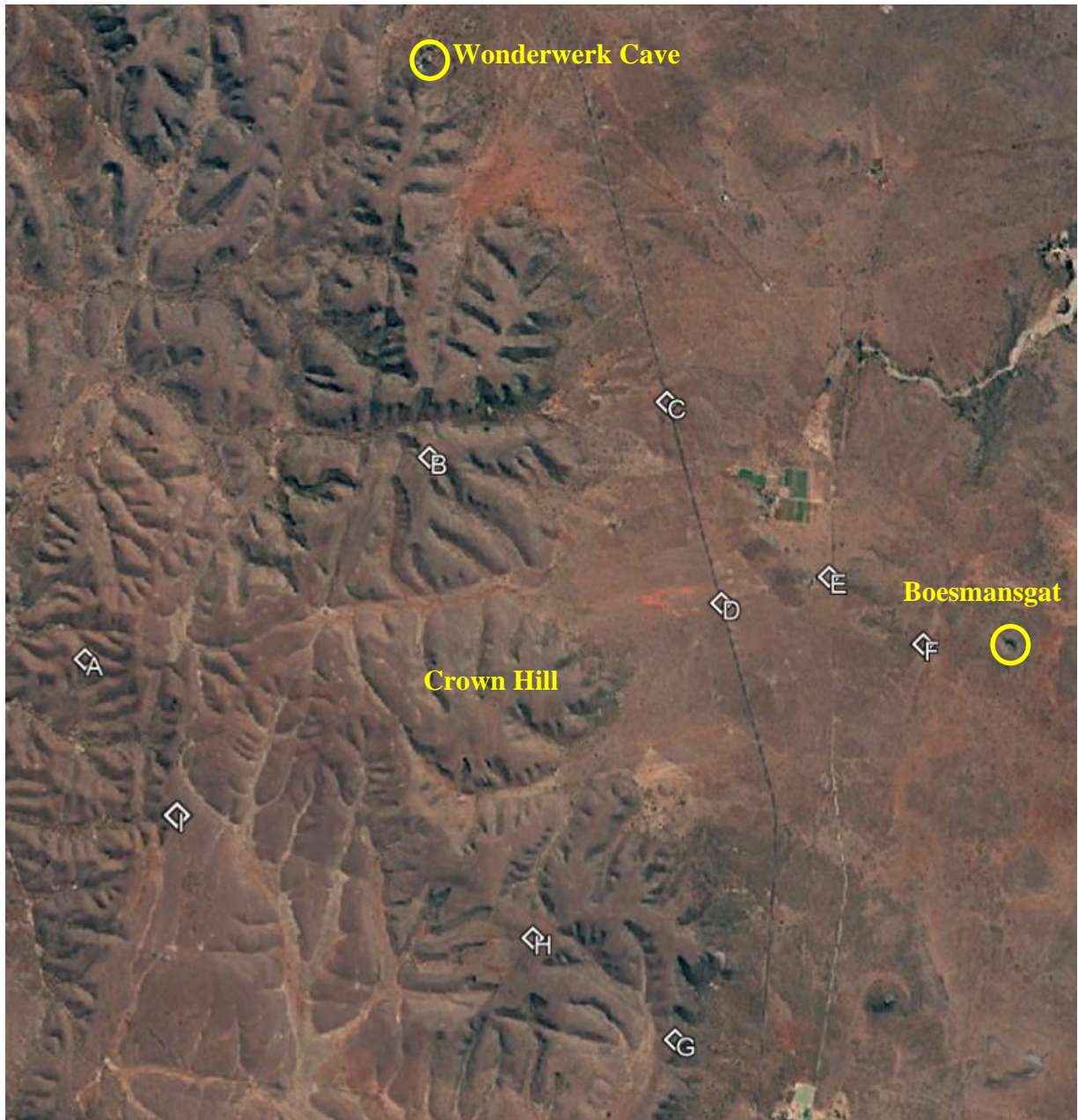


Figure 2. Google Earth image indicating Crown Hill (A-I) indicating its situation relative to Wonderwerk Cave and Boesmanggat.

## 2.1 Description of heritage features of the region

It appears from records at the McGregor Museum and on SAHRIS that no archaeological survey work had been carried out on the farm Crown Hill.

In the wider vicinity, however, the Grade 1 National Heritage Site of Wonderwerk Cave is of international significance, while the Boesmansgat site is of high intangible heritage significance. Crown Hill is arguably within the buffer zone of these two sites and hence impacts of possible future mining would need to be carefully evaluated.

Broadly speaking, the archaeological record of this region reflects the long span of human history from Earlier Stone Age times (some 2 million years, at Wonderwerk Cave, to about 250 000 years ago), through the Middle Stone Age (to about 30 000 years ago), to the Later Stone Age (up to the protocolonial era). The last 2000 years was a period of increasing social complexity with the appearance of farming (herding and agriculture) alongside foraging, and of ceramic and metallurgical (Iron Age) technologies alongside an older trajectory of stone tool making. Iron Age pottery has been found at and near Kathu and at sites in the Langeberg west of the study site. Of interest in this area is evidence of early mining of specularite, a sparkling mineral that was used in cosmetic and ritual contexts in from early times (Beaumont 1973). Rock art is known in the form of rock engravings, e.g. at and near Daniëlskuil and as finger paintings at Wonderwerk Cave and in small shelters in the Kuruman Hills (Fock & Fock 1984; Morris 2016).

Wonderwerk Cave (Chazan et al. 2017) provides an important sequence and context against which to assess the age and significance of any Stone Age finds that may be made at Crown Hill.

There is no indication of Early Iron Age occupation in this drier western interior, with the highveld being occupied by Later Iron Age farmers (Sotho-Tswana) from the mid-second-millennium CE. The western edge of this spread was represented by Tlhaping and Tlharo in the later eighteenth century and occupied by them (alongside, or with enclaves of, San and Korana, and frontier communities of Griqua) until the colonial wars, particularly the Phokwane and Langeberg Wars of 1878-9 and 1896-7, whereafter land – incorporated into the colony – was divided into white-owned farms.

The main axis of colonial penetration north of the Orange River had been the so-called missionary road through Tsantsabane (Postmasburg) to Kuruman, to the west of the study site, and via Daniëlskuil (a major Griqua outpost), passing up the eastern flank of the Kuruman Hills (i.e. through the eastern part of Crown Hill).

Colonial towns emerged in the late nineteenth century: Kuruman in proximity to the LMS Moffat Mission Station, and a secular colonial municipality from 1895; Daniëlskuil, from a Griqua stronghold with mission church, was given municipal status in 1892. Both places were fortified during the Anglo-Boer War (Kuruman being besieged). Colonial farmsteads dot the landscape, and graves of settlers and labour associated with these farms occur. Mining interests along and within the Kuruman Hills in this region were mainly in prospecting and mining for asbestos.

## **2.2 Description and evaluation of environmental issues and potential impacts identified in the scoping phase**

Heritage resources including archaeological sites are in each instance unique and non-renewable resources. Area and linear developments such as those envisaged can have a permanent destructive impact on these resources. The objective of an AIA would be to assess the sensitivity of such resources where present, to evaluate the significance of potential impacts on these resources and, if and where appropriate, to recommend no-go areas and measures to mitigate or manage said impacts.

Relatively localised to wider area impacts are possible in the case of the proposed Crown Hill operations.

### ***2.2.1 Direct, indirect and cumulative impacts (in terms of nature, magnitude and extent)***

The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during prospecting events. In the long term, the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of vehicles and people in the immediate or surrounding vicinity, and impacts on heritage resources such as Wonderwerk Cave and Boesmansgat would need to be evaluated.

## **3. METHODOLOGY**

A site visit was carried out on 23 January 2023 when the proposed prospecting/mining development team and the present AIA author met with farm



owner Mrs Isabel du Toit and her husband, being guided along two valleys, to visit known old asbestos prospecting sites, traversing and inspecting parts of the landscape on foot.

### **3.1 Assumptions and limitations**

It was assumed that, by and large in this landscape, with its relatively sparse vegetation, surface archaeological visibility would be reasonable to good. Hillsides were composed of BIF scree, while valley bottoms have sandy soil profiles. Some sense of the archaeology of the terrain should be apparent. However, there remains potential for significant features to be obscured below the present surface particularly in the valley bottoms.



Figure 3. A valley in the Kuruman Hills, Crown Hill.

Should sites or features of significance be encountered during prospecting or any other operation (these could include an unmarked burial, an ostrich eggshell water

flask cache, or a high density of stone tools, for instance), specified steps are necessary (cease work, report to heritage authority).

This study does not include a Palaeontological Impact Assessment. Being locally underlain by BIF, impacts on palaeontological resources would be unlikely, but with adjacent dolomite occurrences being of higher sensitivity.

### **3.2 Scoping: predictions prior to the field visit**

- » It was noted that significant sites are known in the area, particularly Wonderwerk Cave and the Boesmangat, and known finger paintings in small rock shelters in the hills nearer to Kuruman – with the implication being that sites with similar features could be found elsewhere in the same landscape. Yet, both Wonderwerk Cave and Boesmangat are highly singular occurrences.

Based on previous findings in the area the terrain at Crown Hill, with its BIF krantzies, may contain small rock shelters containing archaeological traces including finger paintings. Pleistocene age artefact scatters might also occur.

- » In the vicinity of farm homesteads there could be noteworthy heritage features including possible colonial/recent farm graves.
- » Traces relating to early-mid twentieth century asbestos prospecting were expected to be found.

### **3.3 Potentially significant impacts to be assessed in the EIA process**

Any area or linear, primary and secondary, disturbance of surfaces in the development locales could have a destructive impact on heritage resources, where present. In the event that such resources are found, they are likely to be of a nature that potential impacts could be mitigated by documentation and/or salvage following approval and permitting by the South African Heritage Resources Agency and, in the case of any built environment features, by the Northern Cape Provincial Heritage

Authority. There may be some that could require preservation *in situ* and hence modification of proposed prospecting configuration.

Disturbance of surfaces includes any construction: of a structure or plant, a road, a pipeline or powerline, or any other *clearance* of, or *excavation* into, a land surface. In the event of archaeological materials being present such activity would alter or destroy their context (even if the artefacts themselves are not destroyed, which is also obviously possible). Without context, archaeological traces are of much reduced significance. It is the contexts as much as the individual items that are protected by the heritage legislation.

### **3.4 Determining archaeological significance**

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (nd) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

#### *Estimating site potential*

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon nd, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes *any* trace, even of only Type 1 quality, can be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

#### *Assessing site value by attribute*

Table 2 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

**Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).**

| <b>Class</b> | <b>Landform</b>   | <b>Type 1</b>   | <b>Type 2</b>  | <b>Type 3</b>   |
|--------------|---|---|--|---|
| L1           | Rocky surface   | Bedrock exposed   | Some soil patches                                    | Sandy/grassy patches  |
| L2           | Ploughed land   | Far from water  | In floodplain  | On old river terrace  |
| L3           | Sandy ground, inland                                      | Far from water  | In floodplain or near feature such as hill           | On old river terrace  |
| L4           | Sandy ground, Coastal                                     | >1 km from sea  | Inland of dune cordon                                | Near rocky shore  |
| L5           | Water-logged deposit                                      | Heavily vegetated   | Running water  | Sedimentary basin   |
| L6           | Developed urban   | Heavily built-up with no known record of early settlement | Known early settlement, but buildings have basements | Buildings without extensive basements over known historical sites |
| L7           | Lime/dolomite   | >5 myrs   | <5000 yrs  | Between 5000 yrs and 5 myrs                                       |
| L8           | Rock shelter  | Rocky floor   | Sloping floor or small area                          | Flat floor, high ceiling  |
| <b>Class</b> | <b>Archaeological traces</b>                              | <b>Type 1</b>   | <b>Type 2</b>  | <b>Type 3</b>   |
| A1           | Area previously excavated                                 | Little deposit remaining                                  | More than half deposit remaining                     | High profile site   |
| A2           | Shell or bones visible                                    | Dispersed scatter   | Deposit <0.5 m thick                                 | Deposit >0.5 m thick; shell and bone dense                        |
| A3           | Stone artefacts or stone walling or other feature visible | Dispersed scatter   | Deposit <0.5 m thick                                 | Deposit >0.5 m thick  |

**Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)**

| <b>Class</b> | <b>Attribute</b>                                     | <b>Type 1</b>   | <b>Type 2</b>    | <b>Type 3</b>  |
|--------------|--|---|------------------|--|
| 1            | Length of sequence/context                           | No sequence<br>Poor context<br>Dispersed distribution | Limited sequence | Long sequence<br>Favourable context<br>High density of arte/ecofacts |
| 2            | Presence of exceptional items (incl regional rarity) | Absent  | Present          | Major element  |
| 3            | Organic preservation                                 | Absent  | Present          | Major element  |

|   |   |     |        |      |
|---|---|-----|--------|------|
| 4 | Potential for future archaeological investigation           | Low | Medium | High |
| 5 | Potential for public display                                | Low | Medium | High |
| 6 | Aesthetic appeal  | Low | Medium | High |
| 7 | Potential for implementation of a long-term management plan | Low | Medium | High |

#### **4. OBSERVATIONS AND ASSESSMENT OF IMPACTS**

The ways in which archaeological and other heritage traces or values might be impacted by the proposed prospecting is summed up with reference to the National Heritage Resources Act (No 25 of 1999) in the following terms: it would be any act or activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, any archaeological material or object. The most obvious impact in this case would be land surface disturbance associated with infrastructure construction at the proposed Bioremediation Centre.

##### **4.1 Fieldwork observations**

Part of the proposed prospecting area was visited on 23 January 2023. In summary the findings can be reported in relation to predictions made in the scoping report (see 3.2 above):

##### **4.1.1 Presence of significant sites:**

Virtually no Stone Age traces were observed, save for quartz nodules associated with two small shelters against the krantzies.



Figure 4. Sites 1-6 documented on 23 January 2023: 1-3 and 6 Asbestos prospecting pits, 4-5 small rock shelters.



Figure 5. Site 2 Asbestos prospecting site.



Figure 6. Site 2 Asbestos prospecting site.



Figure 7. Site 4 – shelf created with flat slab – adjacent to old prospecting pit.



Figure 8. Site 5. The largest rock shelter in the valley – no archaeological deposit nor artefacts and no finger paintings.





Figure 9. Site 6. Stone structure around prospecting pit, upslope from a prospecting trench.



Figure 10. Site 6. Stone structure around prospecting pit, upslope from a prospecting trench.

| Site | Lat        | Long       | Description  |
|------|------------|------------|--|
| 1    | 27.56.29.4 | 23.34.44.7 | Historical asbestos mining prospecting pit             |
| 2    | 27.57.12.5 | 23.34.16.8 | Historical asbestos mining prospecting pit             |
| 3    | 27.57.12.8 | 23.34.11.8 | Historical asbestos mining prospecting pit             |
| 4    | 27.57.12.3 | 23.34.10.6 | Small rock shelter with artificial 'shelf'             |
| 5    | 27.57.17.7 | 23.33.57.9 | Larger rock shelter – no artefacts or finger paintings |
| 6    | 27.57.06.6 | 23.34.08.6 | Historical asbestos mining prospecting pit             |

#### **4.1.2 Colonial era features such as graves:**

Apart from farm fences, no colonial or other farming infrastructure, homesteads, ruins, or graves were noted. The old farmstead is located across and east of the R31 in an area not scheduled for prospecting (Isabel du Toit pers comm).

#### **4.2 Characterising the archaeological significance (Refer to 3.4 above)**

In terms of the significance matrices in Tables 1 and 2 under 3.4 above, the archaeological observations fall under Landform L1 Type 1. In terms of archaeological traces they all fall under Class A3 Type 1. All of these ascriptions (Table 1) reflect poor contexts and low significance for these criteria.

For site attribute and value assessment (Table 2), most of the observations noted fall under Type 1 for Classes 1-7, again reflecting low significance, low potential and absence of contextual and key types of evidence.

### 4.3 Characterising the significance of impacts – preliminary findings for part of the property

The following weighted criteria are used in this study to characterise the significance of direct, indirect and cumulative impacts:

- » **Nature:** description of what causes the effect, what will be affected, and how it will be affected.
- » **Extent:** whether the impact will be local (limited to the immediate area or site of development) or wider:
  - \* local extending only as far as the development site area – assigned a score of 1;
  - \* limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
  - \* will have an impact on the region – assigned a score of 3;
  - \* will have an impact on a national scale – assigned a score of 4; or
  - \* will have an impact across international borders – assigned a score of 5.
- » **Duration:**
  - \* the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - \* the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - \* medium-term (5–15 years) – assigned a score of 3;
  - \* long term (> 15 years) - assigned a score of 4; or
  - \* permanent - assigned a score of 5.
- » **Magnitude:**
  - \* 0 is small and will have no effect on the environment;
  - \* 2 is minor and will not result in an impact on processes;
  - \* 4 is low and will cause a slight impact on processes;
  - \* 6 is moderate and will result in processes continuing but in a modified way;
  - \* 8 is high (processes are altered to the extent that they temporarily cease);  
and
  - \* 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- » **Probability** of actual occurrence:

- \* 1 is very improbable (probably will not happen);
  - \* 2 is improbable (some possibility, but low likelihood);
  - \* 3 is probable (distinct possibility);
  - \* 4 is highly probable (most likely); and
  - \* 5 is definite (impact will occur regardless of any prevention measures).
- » **Significance**, determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
  - » the **status**, which will be described as either positive, negative or neutral.
  - » the degree to which the impact can be reversed.
  - » the degree to which the impact may cause irreplaceable loss of resources.
  - » the *degree* to which the impact can be *mitigated*.

The **significance** is determined by the following formula:

**S = (E+D+M) P**; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

#### ***4.3.1 Impact tables summarising the significance of impacts (with and without mitigation)***

##### **4.3.1.1 For part of Crown Hill property already examined**

**Nature:**

Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from its original position (consequences), of any archaeological material or object (what affected).

|   | <b>Without mitigation</b>           | <b>With mitigation</b> |
|---|-------------------------------------|------------------------|
| <b>Extent</b>   | 1                                   | n/a                    |
| <b>Duration</b>   | 5                                   | n/a                    |
| <b>Magnitude</b>  | 2                                   | n/a                    |
| <b>Probability</b>  | 2                                   | n/a                    |
| <b>Significance</b>   | <b>16</b>                           | <b>n/a</b>             |
| <b>Status (positive or negative)</b>  | Neutral                             | Neutral                |
| <b>Reversibility</b>  | No                                  | No                     |
| <b>Irreplaceable loss of resources?</b>   | Yes, where present.                 |                        |
| <b>Can impacts be mitigated?</b>  | No mitigation regarded as necessary | Not necessary          |
| <b>Mitigation:</b> Mitigation Measures: Artefact densities – virtually zero in the area covered, but asbestos prospecting pits and structures noted. Unlike biological processes, heritage destruction generally has a once-off permanent impact, hence highest 'Duration' weighting. Overall significance indicated in this matrix returns a LOW value (<30 points). Mitigation measures are not considered necessary. |                                     |                        |
| <b>Cumulative impacts:</b> Cumulative Impacts: where any archaeological contexts occur the impacts, unless mitigated, are once-off permanent destructive events. Further survey work is required on the property and the cumulative impacts relative to nearby heritage sites of known very high significance need to be evaluated.   |                                     |                        |
| <b>Residual Impacts:</b> -  |                                     |                        |

## **5. CONCLUSIONS**

A low density of heritage traces was found during this preliminary assessment of the Crown Hill property.

From an archaeological perspective the observed heritage resources score low in terms of the various significance criteria applied.

No mitigation measures are considered necessary for the sites located thus far.

From an Archaeological and Cultural Heritage point of view it is recommended that the proposed prospecting in the area covered thus far may proceed; with the proviso that:

- \* should any archaeological sites/features or graves be exposed during prospecting or any prior or subsequent operations, it must be reported immediately to a heritage authority so that specialist investigation and evaluation can take place to determine a way forward.

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