

**SCOPING ARCHAEOLOGICAL IMPACT ASSESSMENT:  
PROPOSED PROSPECTING ON DENMARK 119 AND GROENE  
VALLEI 226 NORTH AND SOUTH (SITE 37), CRADOCK,  
EASTERN CAPE.**

(Assessment conducted under Section 38 (8) of the  
National Heritage Resources Act No 25 of 1999)

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## EXECUTIVE SUMMARY

The Archaeology Contracts Office at the University of Cape Town was appointed by Tasman Pacific Minerals Limited prior to the approval of an amended EMP for rights to drill for uranium and molybdenum on Denmark 119 and Groene Vallei 226 (Site 37) located on the R61 between Graaff Reinet and Cradock in the Eastern Cape.

A literature survey indicated that very little was known of the archaeology of the area. A survey was conducted by Lita Webley and Tim Hart on 26 May 2010. The drill areas are relatively small and we are confident that we have obtained a reasonable coverage. Denmark is completely flat, with only a small ridge along the eastern margin which was surveyed carefully. Groene Vallei North and South are located against two sides of a steep koppie. We are confident that we covered the most sensitive area and that a detailed AIA is unlikely to produce significantly more sites.

Prospecting on the farms will involve drilling holes some 14cm in diameter every 10000 m<sup>2</sup> to 250 m<sup>2</sup> in designated drill areas. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralization as quickly as possible and once the margins have been identified further lateral drilling away from the target will be terminated. In all cases, the drill areas are a considerable distance from the farm houses and associated farm buildings and graveyards and they are not threatened in any way.

A baseline archaeological survey of the drill area on the farm Denmark (Site 37) identified a number of small stone tool scatters close to the edge of the drill area, on a little rocky ledge. These "sites" are of low significance but very little is known about the Stone Age archaeology of the Cradock area and until we know more it is recommended that they are conserved. Since Tasmin Pacific Minerals Limited maintain an interest in the rocky ledge due to its uranium enrichment the following is recommended:

- That an archaeologist should be present when boreholes are sited along the ridge on *Denmark to ensure that no significance archaeological sites are destroyed*. The archaeologist will be in a position to give the all clear, or to request that a particular borehole is relocated if an archaeological site is threatened.

If the drilling programme results in a decision to commence mining, then further archaeological investigation will take part as part of the Environmental Management Programme.

A baseline archaeological survey of the two drill areas on the farm Groene Vallei (Site 37) identified evidence for Stone Age quarrying activities on the lower slopes of the koppie. While little is known about prehistoric quarrying of stone artefacts, the densest distribution of quarry activities occurs on the lower slopes of the koppie, below the drill areas.

- No mitigation is required during the prospecting phase on Groene Vallei. However it is recommended that this suggestion is re-assessed if mining takes place, in order to ensure that a sample of material is collected (see above).

There are no significant issues which would prevent prospecting on in the drill areas on Denmark and Groene Vallei. We advise that prospecting work should cease if any of the following are uncovered:

- Human remains/graves
- Concentrations of stone tools or faunal remains
- Stone walling or any sub-surface structures
- Fossils

If any of the above is uncovered, SAHRA should be notified so that an archaeologist/palaeontologist can investigate further.

## TABLE OF CONTENTS

<b>GLOSSARY</b>	<b>5</b>
<b>1. INTRODUCTION</b>	<b>6</b>
<b>2. BACKGROUND TO PROSPECTING</b>	<b>6</b>
<b>3. TERMS OF REFERENCE</b>	<b>7</b>
<b>4. LEGISLATION</b>	<b>13</b>
<b>5. RECEIVING ENVIRONMENT</b>	<b>13</b>
<b>6. METHODS</b>	<b>17</b>
<b>7. RESULTS OF SURVEY</b>	<b>17</b>
<b>8. SITE SIGNIFICANCE, IMPACT OF DEVELOPMENT &amp; MITIGATION</b>	<b>20</b>
<b>9. CONCLUSIONS AND RECOMMENDATIONS</b>	<b>21</b>
<b>10. REFERENCES</b>	<b>22</b>
<b>11. ACKNOWLEDGEMENTS</b>	<b>22</b>

## **GLOSSARY**

- ESA: Early Stone Age – The archaeology of the Stone Age between 700 000 and 2500 000 years ago.
- Khoekhoen: Pastoralist groups, with cattle, sheep and pottery who settled in southern Africa around 2000 years ago.
- LSA: Later Stone Age – The archaeology of the last 20 000 years associated with fully modern people.
- MSA: Middle Stone Age - The archaeology of the Stone Age between 300 000 – 20 000 years ago associated with early modern humans.
- NHRA: National Heritage Resources Act, No 25 of 1999.
- SAHRA: South African Heritage Resources Agency
- San: Indigenous hunter-gatherer groups who lived in small bands spread across a wide area of southern Africa.

## **1. INTRODUCTION**

The Archaeology Contracts Office (ACO) at the University of Cape Town was approached by Tasman Pacific Minerals Limited to undertake an Archaeological Impact Assessment prior to the approval of an amended EMP for prospecting rights for uranium and molybdenum on the farms Denmark 119 and Groene Vallei 226 (referred to as Site 37) situated on either side of the R61 between Graaff Reinet and Cradock in the Eastern Cape (Figure 1).

## **2. BACKGROUND TO PROSPECTING**

The client, Tasman Pacific Minerals Limited, intends to conduct a series of drilling programmes to prospect for uranium and molybdenum ores.

The client has applied to amend their existing, approved Environmental Management Plans and Prospecting Work Programmes to allow drilling activities to occur within 12 designated drilling project areas scattered throughout the Karoo region of South Africa.

Drilling will be conducted from truck mounted drilling rigs and will occur in two phases. The first phase will see holes drilled on pre-determined 100 m x 100 m grid arrays. This initial drilling array will be used to delineate the location and aerial extent of any subsurface mineralisation. Should such subsurface mineralisation be identified then a closer spaced 50 m x 50 m grid will be drilled in the immediate area of that mineralisation so as to be able to more accurately quantify the thickness and uranium/molybdenum grade distribution within the deposit.

The nature of the planned drilling means that the largest hole diameter on surface will be 5½ inches (approximately 14 cm diameter hole every 10000 m<sup>2</sup> to 250 m<sup>2</sup>). Thus, there will not be extensive disruption of the land surface (i.e. no trenching, pitting or test mining is allowed under these amended EMPs or PWPs).

On all sites there are existing farm roads providing access directly to, or near by the drilling project areas. No new graded roads are proposed to be manufactured. Drill rigs will be wheel mounted and, thus, any vehicular traffic will produce "twin spoor": tracks. Vehicular traffic will only be allowed along (and not between) pre-designated pathways. Accordingly, most of the veld will never be subjected to vehicular traffic (i.e., two parallel wheel tracks every 50 m at worst).

At all times during the drilling programme there will be (as stipulated in the amended EMP for each area) a designated Environmental Control Officer whose role it will be to ensure compliance with the criteria within the EMP.

This officer will be the site geologist and, as such will have a background that will enable them to identify any fossils that might be located at the proposed borehole positions or along the tracks utilised by vehicles. Should any be located then the borehole would be relocated to avoid damage or the fossil assessed by a suitably qualified professional and if appropriate excavated and lodged with an appropriately accredited organization.

The drill areas provided to the ACO are the same as those included within the amended Prospecting Work Programme (PWP) and Environmental Management Plan (EMP) documents submitted to the Department of Minerals and Energy. These are the only areas within the total extent of the Prospecting Rights held by Tasman Pacific Minerals in which any disturbance of the Earth's surface will be allowed. Thus, these are the only locations within the Prospecting Right areas in which there is a risk of impact upon the archaeological heritage.

With regard to the exact locations of the proposed boreholes; the client indicated that it would not be a useful exercise for the ACO to inspect the site of every proposed borehole as indicated in the amended EMP and PWP documents for the following reasons:

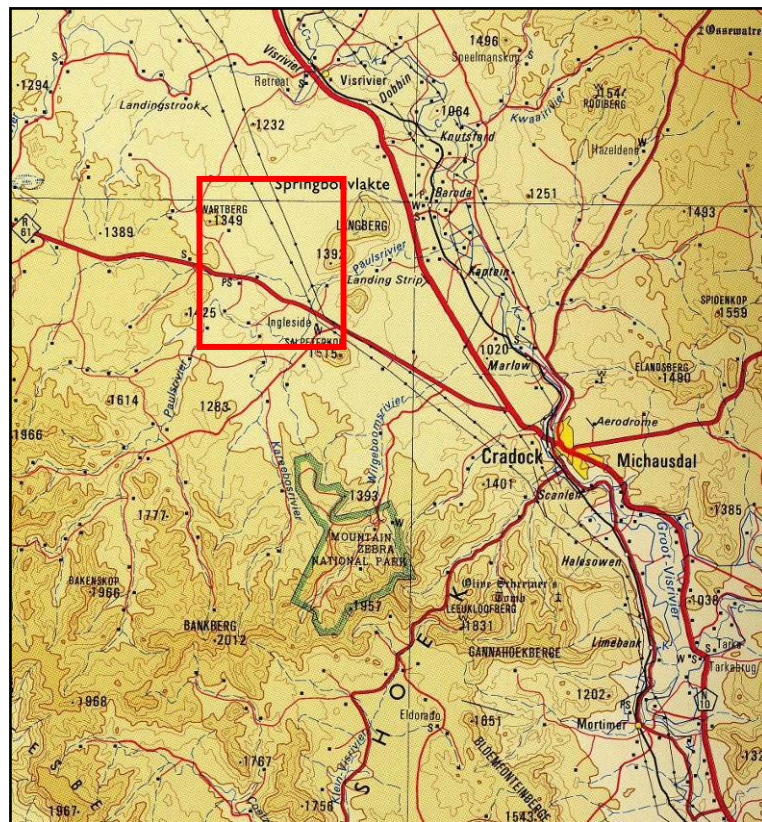
- a. For various reasons those documents indicate the location of a great many more proposed boreholes than will ever be drilled. However, the reality is that only a small percentage of these will ever be drilled. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralisation as quickly as possible and once the margins are identified further lateral drilling away from the target will be terminated. This procedure is necessitated by the tremendous uncertainty of the location, extent and orientation of any subsurface mineralization;
- b. Further to point a, is entirely possible that the early stages of drilling may suggest that the programme is not viable and, in this case almost all of the holes will not be drilled;
- c. The boreholes have been located, sight unseen, on a predefined grid. The reality is that when it comes time to site the holes in the field many of the holes will need to be re-sited slightly due to inappropriate local topography etc. Accordingly, the site inspection would be a waste of time in these cases;
- d. An effective and comprehensive survey of the various project areas, rather than one centred on pin point locations (i.e. borehole locations), would provide a better methodology as it could identify broad areas where drilling would be undesirable or inappropriate. A pin-point approach would need months of field work, at prohibitive expense and for the most part be wasted effort;

- e. Should mining be the eventual outcome of the exploration efforts a much more comprehensive examination and report would be required for inclusion in the Environmental Management Programme in any case.

### 3. TERMS OF REFERENCE

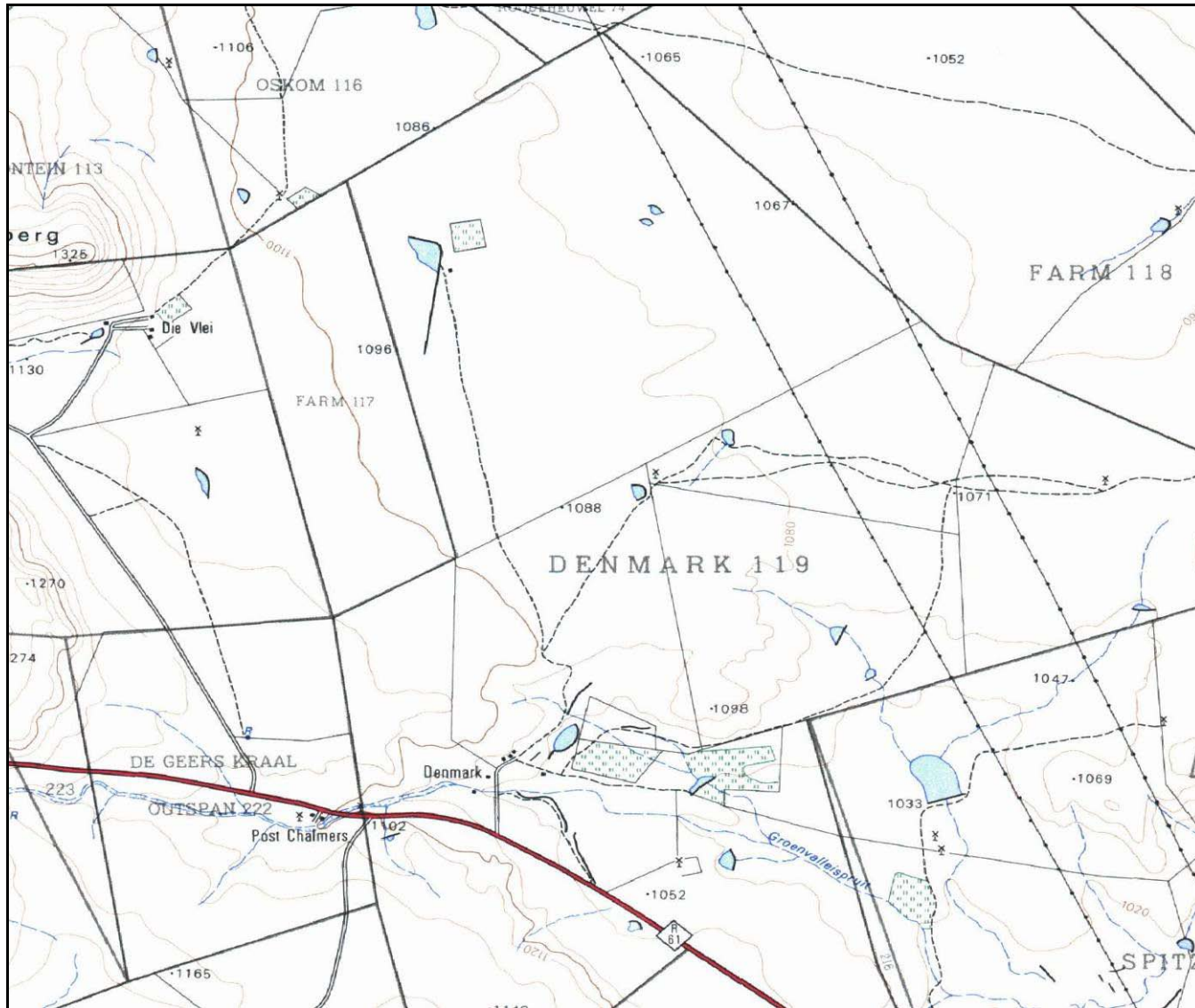
The ACO undertook to undertake a baseline investigation including the following:

- Identification of archaeological sites through a desk top survey and site visit
- Rating of significance of archaeological sites on the properties
- Assessment of the impact of prospecting on the archaeology of the properties
- Recommendations for mitigation.

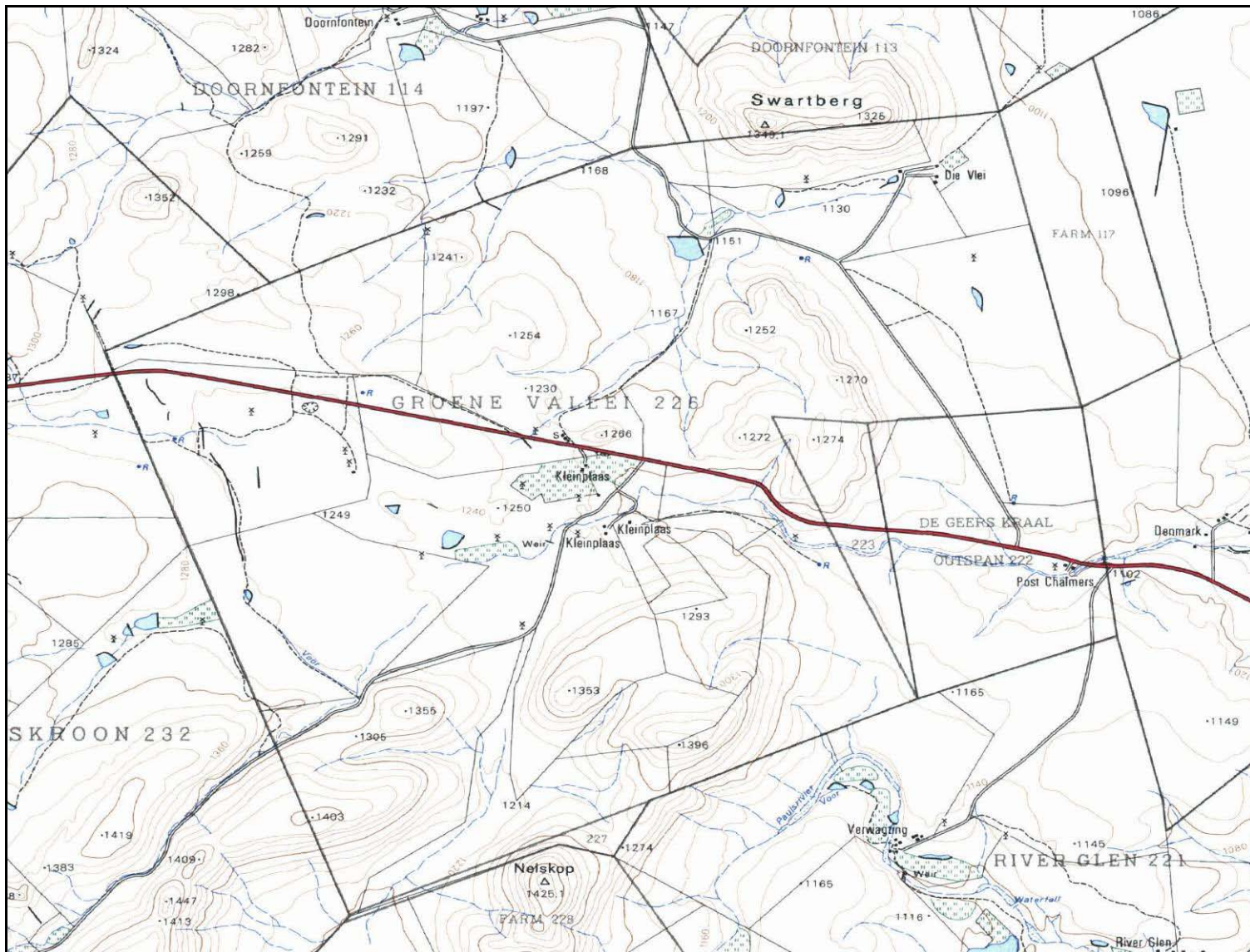


**Figure 1:** Location of the farms Denmark and Groene Vallei to the east of Cradock in the Eastern Cape Province.

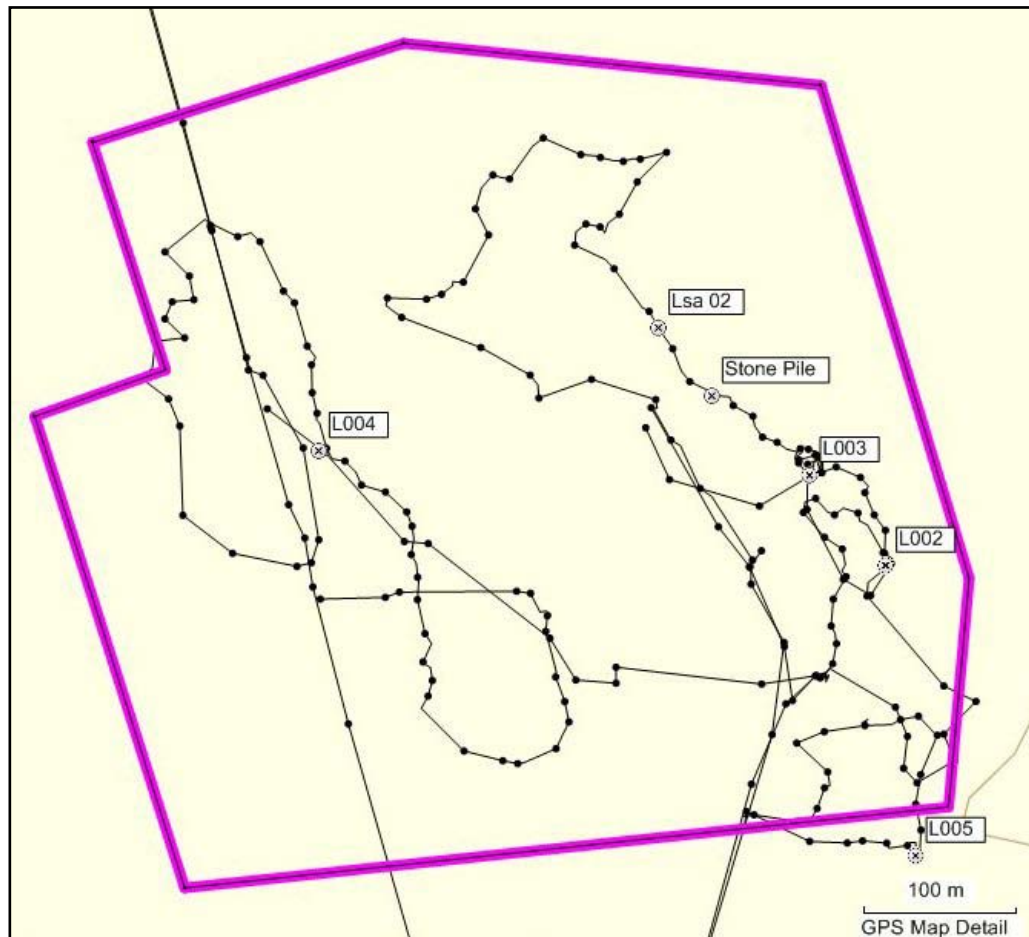




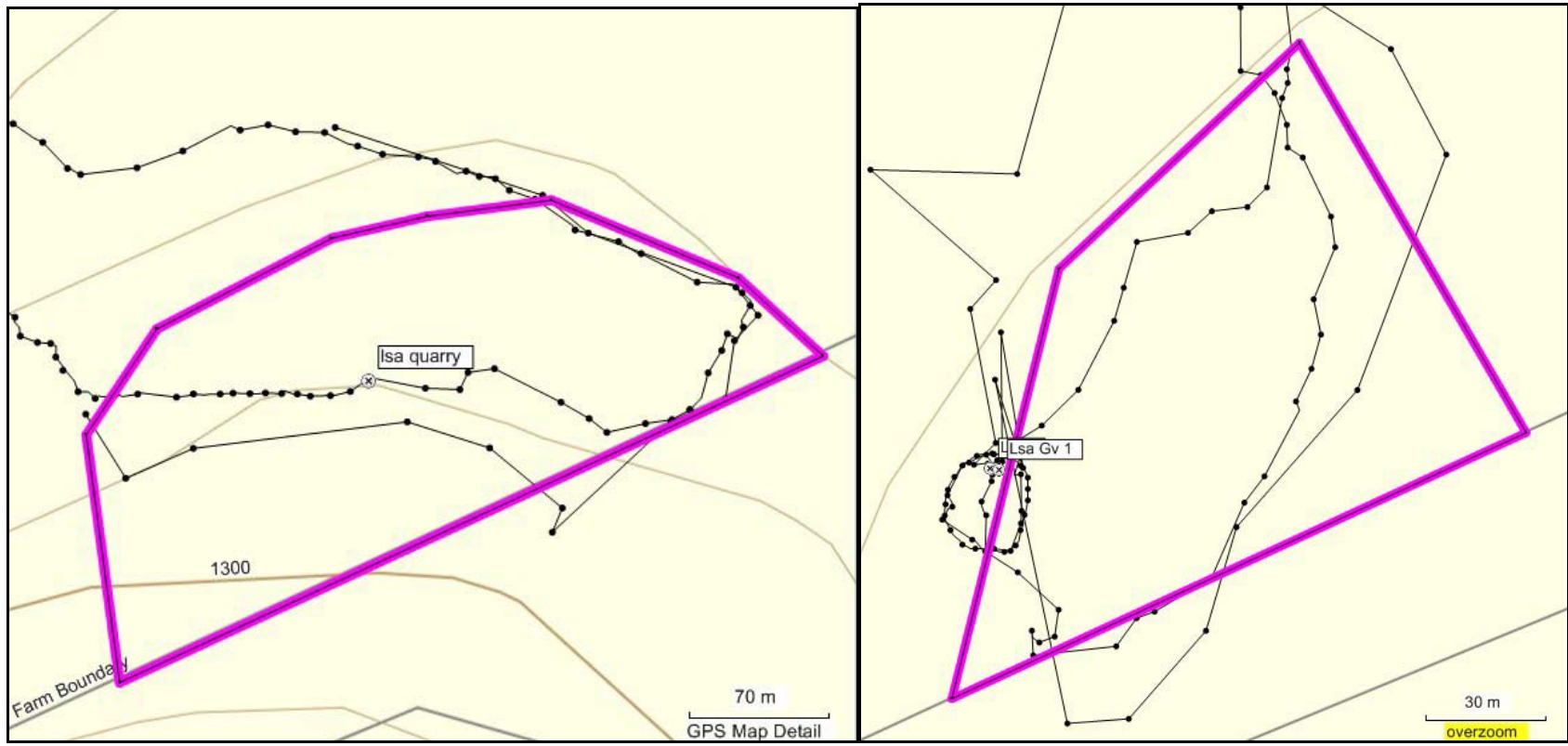
**Figure 2:** The 1:50 000 map sheet 3225 (Post Chalmers) (Mapping information supplied by: Chief Directorate: Surveys and Mapping (web: w3sli.wcape.gov.za) indicating the farm Denmark and its location to the north of the R61 connecting Graaff Reinet and Cradock in the Eastern Cape. The drill area is located in the north-west portion of the farm, see Figure 4.



**Figure 3:** The 1:50 000 map sheet 3225 (Post Chalmeres) (Mapping information supplied by: Chief Directorate: Surveys and Mapping (web: w3sli.wcape.gov.za) indicating the farm Groene Valleï and its location to the south of the R61, connecting Graaff Reinet and Cradock in the Eastern Cape. The drill area is located in the southern portion of the farm, see Figure 5.



**Figure 4:** Map showing the extent of the drilling area on Denmark and the tracks walked during the survey. The edge of the ridge is clearly shown by the density of sites clustering along a line on the eastern side.



**Figure 5:** Groene Vallei (south) on the right, with the dense distribution of flaked material indicated just outside the drilling area. Groene Vallei north (left) shows the steep contours of the drill area.

#### **4. LEGISLATION**

The basis for all heritage impact assessment is the National Heritage Resources Act 25 (NHRA) of 1999, which in turn prescribes the manner in which heritage is assessed and managed. The National Heritage Resources Act 25 of 1999 has defined certain kinds of heritage as being worthy of protection, by either specific or general protection mechanisms. In South Africa the law is directed towards the protection of human made heritage, although places and objects of scientific importance are covered. The National Heritage Resources Act also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. Generally protected heritage which must be considered in any heritage assessment includes:

- Cultural landscapes
- Buildings and structures (greater than 60 years of age)
- Archaeological sites (greater than 100 years of age)
- Palaeontological sites and specimens
- Shipwrecks and aircraft wrecks
- Graves and grave yards.

Section 38 of the NHRA requires that Heritage Impact Assessments (HIA's) are required for certain kinds of development such as rezoning of land greater than 10 000 sq m in extent or exceeding 3 or more sub-divisions, or for any activity that will alter the character or landscape of a site greater than 5000 sq m.

#### **5. RECEIVING ENVIRONMENT**

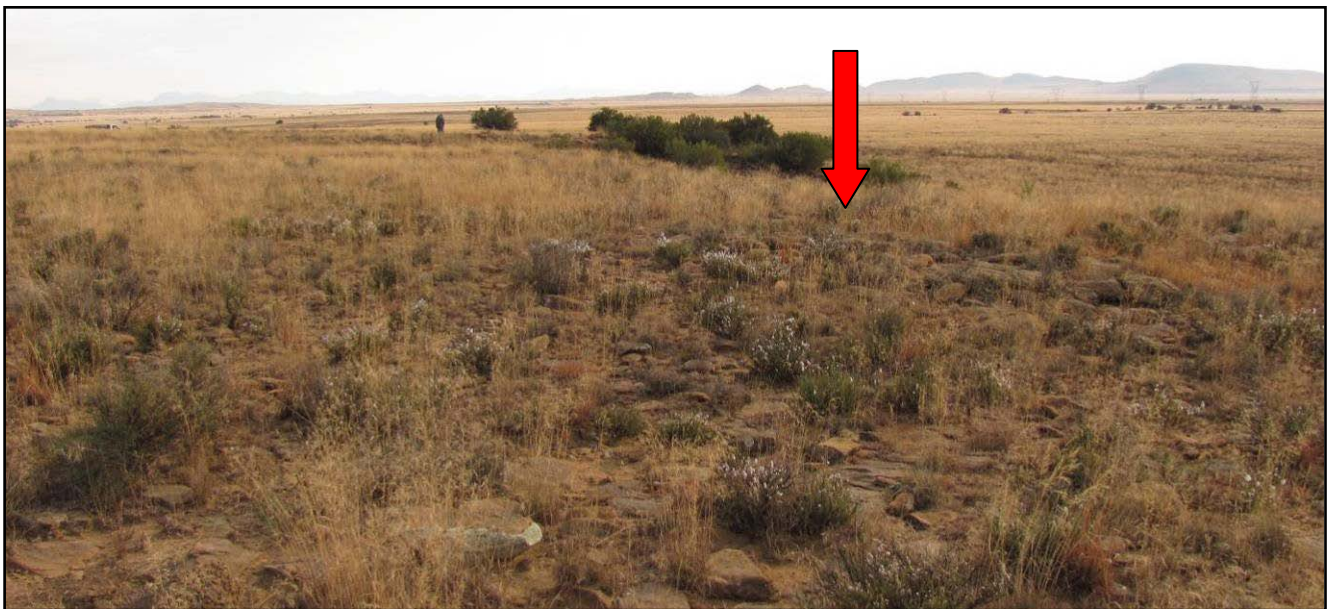
The mountains and kopjes in the East Cape Midlands (Skead 2007) are comprised of horizontally bedded, fossiliferous shales and mudstones of the Beaufort Group of the Karoo Supergroup. They are intersected at numerous locations by dolerite dykes and sills that are more resistant to erosion than the surrounding sedimentary rocks. While small overhangs do occur under the lintels of these dolerite caps, they are very rare. These sedimentary rocks tend to weather into angular slab like rocks which are widely distributed in the study area.

Dykes and sills have baked the surrounding shales resulting in patches of high quality hornfels. Hornfels is an attractive rock for stone tool makers because it flakes predictably and produces sharp edges (Parkington et al 2008). The majority of artefacts found in the study area are of hornfels (also known as indurated shales).

According to Skead (2007) Cradock is located in the Central Midland section of the East Cape Midlands. The main drainage channel comprises the Great Fish River and its many tributaries and the veld is covered with what is termed False

Karrooid Broken Veld, comprising short karoo bushes and grasses. Cradock has a low rainfall of around 250 mm which falls throughout the year and a temperature range between 16 C° in winter and 29 C° in summer. Minimum nighttime temperatures in winter may drop to 2 C° and snow does occur. Historically, plains animals such as springbuck roamed the areas to the north and north-east of Cradock. Stock farming, predominantly sheep farming, is widespread although some farms also keep small numbers of game.

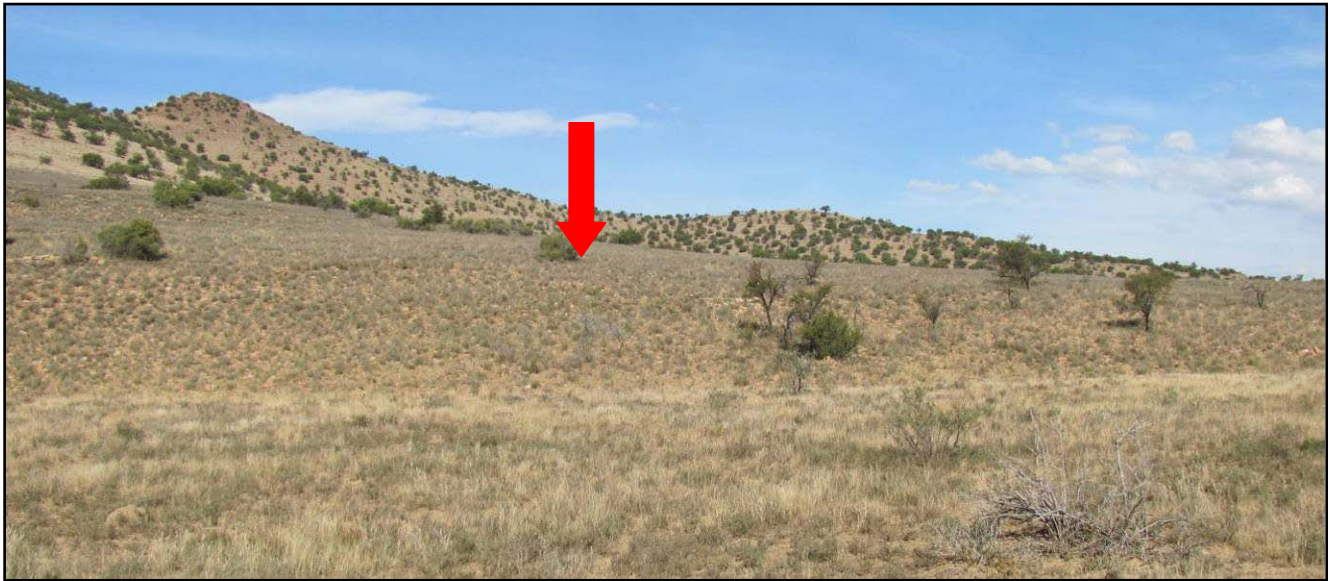
The farm **Denmark** is located to the north of the R61, some 20 km from Cradock (Figure 1). The countryside comprises a shale substrate covered in low grass and shrubs. The drill area (Figure 4) is almost completely level, but has a slight ridge on its eastern border. This low ridge dips down to a river valley which becomes a tributary of the Pauls River (Figure 2). However, this drainage system is outside the area. The ridge is only around 3m in height, and is comprised of slabs of angular shale. There is no shelters or overhangs for human settlement. However, the area immediately below the ridge provides some slight protection from the elements and the ridge may have provided a focal point for human settlement in the past.



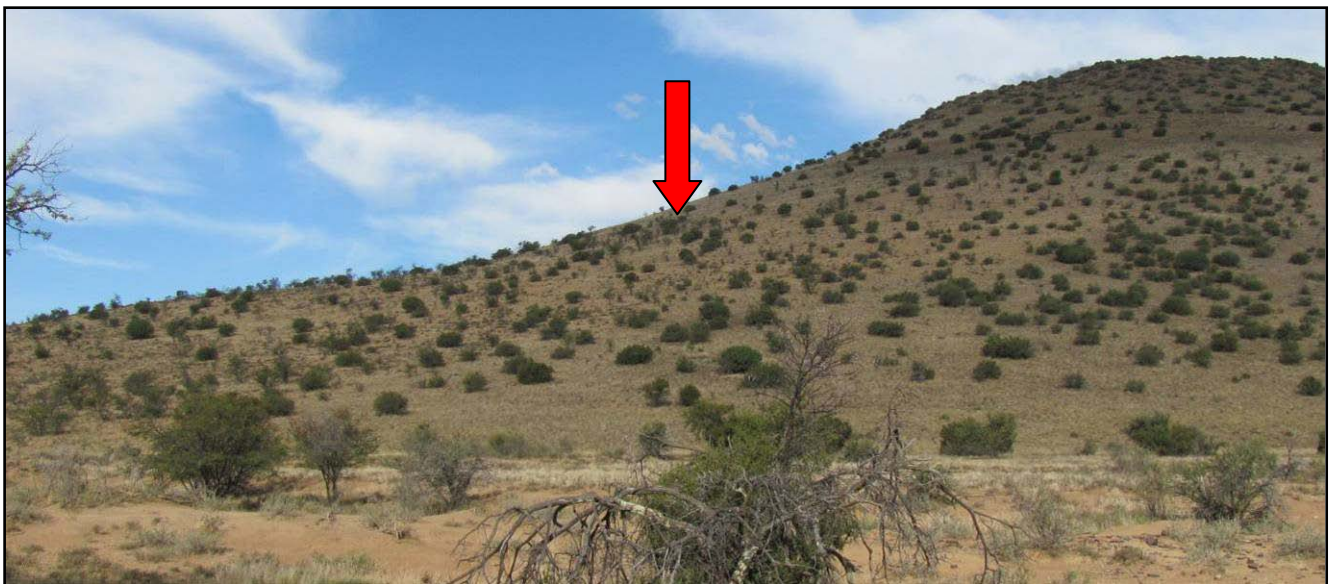
**Plate 1:** View of the drill area on Denmark showing the terrain and vegetation. The rocky ridge runs along the edge of the drill area (red arrow) and consists of the loose rocks and shrubs seen to the right. The human figure provides scale in the distance.

The farm **Groene Vallei** is located to the south of the R61, diagonally south-west of Denmark (Figure 3). Two portions of the farm have been identified for prospecting and they are designated as Groene Vallei North and South (Figure 5). The drill areas are accessed by a gravel farm road which winds southward from the R61 (Figure 3). The two drill areas are located on the sides of a very high koppie. This koppie is not named on the topographic map, but Nelskop occurs just to the south on an adjoining farm. The slopes are covered in angular rocks and

very low vegetation. A tributary of the Groenvalleispruit has its origins on this farm.



**Plate 2:** Groene Vallei south, on the lower slopes of the koppie. The red arrow indicates the location of the drill area.



**Plate 3:** Groene Vallei north, on the upper slopes of the koppie. The red arrow indicates the approximate location of the drill area.

## 5.1 Archaeological Background

There has been no systematic archaeological work undertaken in the Cradock area and these comments are based on some general observations derived from unpublished records from surrounding areas. Cradock is located to the south of the Upper Seacow River Valley which formed the focus of the most detailed and comprehensive investigation of the Karoo undertaken by Sampson (1988).

Most Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread. More intensive occupation of the Karoo started around 13 000 years ago during the Later Stone Age.

Sampson (1988) recorded some six thousand archaeological sites which he ascribed to Bushmen hunter-gatherers and Khoekhoen pastoralists. The archaeological remains relating to the Bushmen have been historically described as the "Smithfield Industry", and are found from the western Free State to the northern part of the Northern Cape. The Smithfield typically contains flaked lithics (on un-patinated blue-black hornfels), grinding equipment, bored stones, and potsherds (typically relating to bowl-shaped pots with stamp impressed decoration). Formal stone tools include endscrapers. Sampson also recognized a Khoekhoen ceramic tradition and he speculates on the chronological ordering of the settlement in the valley (1988). He notes that many of the Smithfield sites occur in dense clusters, and that they are concentrated on the flat sandy patches on the foot slopes and crests of dolerite hills and ridges, usually within a half-hour walk (1 km radius) of a fountain. Many of these sites are protected from the winds by low ridges and boulders, in other words shelter especially in the winter months is of paramount importance.

Amateur archaeologists have made collections of stone tools from the Cradock area since the 1920s and many of these artefacts are stored in the Albany Museum in Grahamstown. For example, J.J. Kissack donated Stone Age material during the 1920s and 1930s. Some he describes as a "Mousterian type" which suggests that they are Middle Stone Age. Freshwater shell middens containing stone artefacts, pottery and ostrich eggshell fragments have been reported from various locations along the Fish River, including Mortimer and Halesowen.

Further to the south-east, around Bedford, Webley, Halkett & Hart (2009) have reported surface scatters of Middle Stone Age implements.

## **5.2 Historical Background**

The survey diagrams for Denmark date to 1947. It appears to have been the result of the consolidation of a number of portions of land, including a section of the De Geers Kraal Outpan and the farm Het Riff. Denmark is separated from Groene Valleï by De Geers Kraal Outspan which contains the abandoned remains of an early 20<sup>th</sup> century police station called Post Chalmers.

Groene Valleï was "re-surveyed" in 1887 in terms of the Amended Title Act of 1879. In this survey diagram, the "main road" is shown crossing the property along approximately the same line as the current R61. There are three houses



shown on the survey map, and they are all located immediately south of the road. Today, these houses are called "Kleinplasië" on the topographic map. There are no buildings or other farm infrastructure shown in the drill areas.

## **6. METHODS**

The boundaries of the sites were loaded onto handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Fieldwork was undertaken by Lita Webley and Tim Hart on the 26 May 2010. Walk paths and site locations were recorded with GPS (Figure 4) and finds were photographed and described. We were taken to the Denmark site by the farm owner, Mr A van Heerden and his wife.

### **6.1 Limitations**

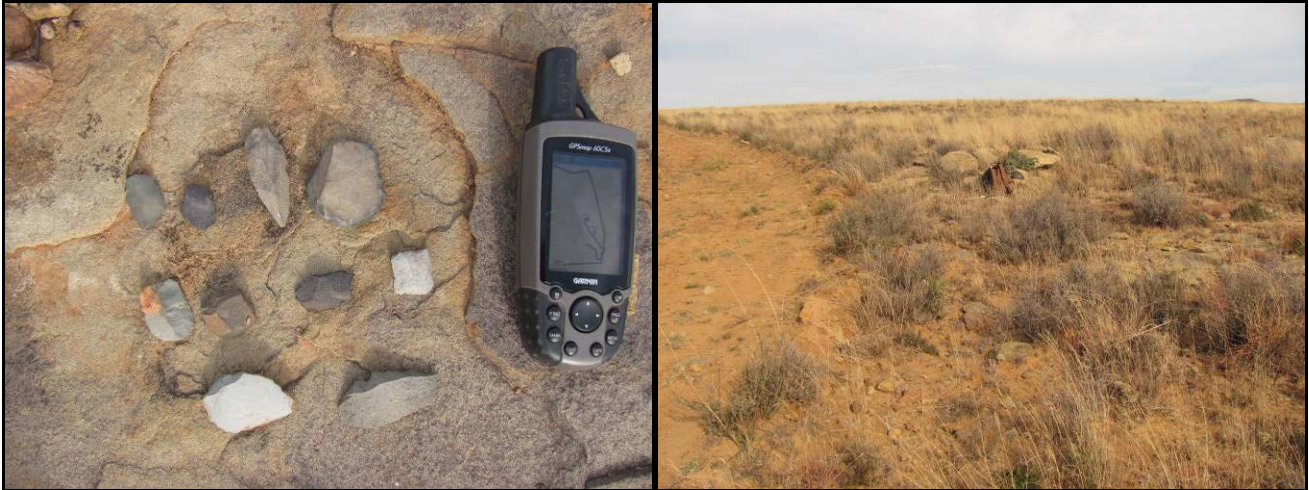
The drill areas on Denmark and Groene Vallei (GV) are relatively small and we are fairly confident that we achieved an adequate coverage on our foot survey. We did not conduct a detailed foot survey as this would have been superfluous. We concentrated on certain locations which we considered were more likely to contain archaeological sites. In the case of Denmark, this included a thorough survey of the ridge. Both drill areas on GV are on the slopes of a koppie. GV south is located on the lower slopes (Plate 2) but GV north is located on the higher slopes (Plate 3). The higher slopes of the koppie are steep and rocky making survey work difficult. We expect that human settlement on these upper slopes is unlikely.

## **7. RESULTS OF FIELD SURVEY**

### Denmark

We commenced our survey on top of the rocky ledge running along the eastern edge of the drill area as it provided the only likely focus in an otherwise featureless terrain. The ridge provides an approximate 2-3m drop in elevation and the area below the ridge provides some protection from the elements. The area below the ridge is outside the drill area. We identified a number of sites (2, 3, 5 and LSA 02) in this ridge area (Figure 4).

Site 3 represents a dense scatter of Later Stone Age material located on the edge of a newly constructed farm road close to the rocky ledge. Part of the site may have been destroyed by the road. There are numerous stone flakes and chunks. Many of the flakes have signs of retouch, such as the scraper illustrated below (Plate 6). The large end-scraper can be described as Smithfield. There are no pottery sherds or ostrich eggshell pieces.



**Plate 4:** Some of the LSA stone artefacts recovered from Site 3. **Plate 5:** The location of Site 3 next to a newly constructed farm road.



**Plate 6:** A hornfels scraper from Site 3. **Plate 7:** A weathered MSA artefact from Site 4.

Sites 2 and 5 are located close to the rocky ledge and probably represent a LSA occupation similar to that found at Site 3. However, the distribution of artefacts is less dense. Finally, Site LSA 02 consists of another scatter of LSA hornfel flakes further to the north of the rocky ledge. A single weathered MSA artefact was found on Site 4.

### Groene Vallei South

Site 6 represents a possible quarry site on a small plateau on the lower slopes of the GV south drill area. There is a quantity of grey hornfels flakes, chunks and cores which appear to have been flaked recently (Plate 8). There is further evidence of hornfels quarrying in the adjoining drill area of GV north.



**Plate 8:** Artefacts from Site 6. **Plate 9:** Stone Cairn from outside the drill area on GV south.

There is a small pile of rocks outside the drill area (Plate 9), it is not clear if it represents a burial cairn or not.

The aridity of the area around Cradock away from the Fish River and its tributaries suggests that pre-colonial occupation would have been restricted. The drill area on *Denmark* contains no pans and the only river system on the farm is located below the ridge area. There is also no shelter from the cold winds above the ridge (which resembles a plateau area) and there is therefore no focus for prehistoric settlement.

#### Groene Vallei North

The drill area is located on the slopes of the koppie, but at a substantially higher elevation than GV south. The entire drill area slopes steeply (Plate 3) and there is no level plateau suitable for human settlement. The lower slopes of this koppie are littered with large numbers of flakes, chunks and cores. The size of the flakes and flaked cobbles suggests that this was a quarrying site.



**Plates 10 & 11:** The stone flakes and cores found on the lower slopes of the koppie –GV north.

A “quarrying site” was recorded in the Groene Vallei North drill area (Figure 5) but the density at this elevation was considerably lower than on the lowest slopes.

## 8. SITE SIGNIFICANCE, IMPACT OF DEVELOPMENT AND MITIGATION

### 8.1 Loss of Pre-colonial Sites

The only suitable area for settlement in the drill area on *Denmark* occurs along the rocky ridge on the eastern margins and a number of Later Stone Age sites were recorded here.

While there is no evidence for pre-colonial settlement within the drill area on *Groene Vallei south and north*, the lower slopes of the koppie contains evidence of Stone Age quarrying activities. A scatter of such quarried material was found on the southern edge of Groene Vallei south, and within the borders of Groene Vallei north.

**Significance:** Section 35 of the NHRA prohibits any person, without a permit, from destroying, damaging, excavating, altering, defacing or disturbing any archaeological sites and material, palaeontological sites and meteorites.

While the Sites found along the ridge on *Denmark* could be considered of low significance, very little is known about the Stone Age archaeology of the Cradock area and until we know more about the area, it is recommended that we conserve the ridge area.

The quarrying sites on Groene Vallei are of unknown significance due to lack of associated information. The quarry area may potentially be of interest to sample if it formed part of a larger research programme into the archaeology of the area. In isolation, the information potential is limited.

- **Mitigation:** It is recommended that an archaeologist should be present when holes are sited along the ridge on *Denmark* to ensure that no significance archaeological sites are destroyed.

The quarrying site is very extensive and is located in a band along the base of the koppie on Groene Vallei. The major concentration of quarried material is situated outside the drill area. For this reason, no mitigation is recommended. However it is recommended that this suggestion is re-assessed if mining takes place, in order to ensure that a sample of material is collected.

## 8.2 Loss of Colonial Sites

There are no buildings or structures such as kraals or stone walls in the drill area.

**Significance:** Section 34 of the NHRA stipulates that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

**Mitigation:** No mitigation is required.

## 8.3 Loss of Graves

There is a heap of stone near the end of the rocky ledge on Denmark and there is a single heap of stones outside of the drill area below Groene Vallei south. Neither is convincing examples of stone cairns or graves.

**Significance:** Section 36 (3) (b) of the NHRA clearly stipulates that no person may, without a permit issued by the relevant heritage authority or SAHRA destroy, damage or exhume any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. It is difficult to assign significance to the stone cairn outside the drill area on Groene Vallei south.

**Mitigation:** It is recommended that any roads which are constructed to the prospecting area should avoid the heap of stones/cairn.

## 9. CONCLUSIONS AND RECOMMENDATIONS

Prospecting on the farms will involve drilling holes some 14cm in diameter every 10000 m<sup>2</sup> to 250 m<sup>2</sup> in designated drill areas. The proposed drilling programme is designed to identify the aerial extent of any subsurface mineralisation as quickly as possible and once the margins of the mineralisation is identified further lateral drilling away from the target will be terminated. In all cases, the drill areas are a considerable distance from the farm house and associated farm buildings and these are not threatened in any way.

A baseline archaeological survey of the drill area on the farm Denmark (Site 37) identified a number of small stone tool scatters close to the edge of the drill area, on a little rocky ledge. These "sites" are of low significance but very little is known about the Stone Age archaeology of the Cradock area and until we know more it is recommended that we conserve the ridge area. However, Tasmin Pacific Minerals Limited has shown an interest in the vicinity of the rocky ridge as this is an area of marked uranium enrichment.

- It is recommended that an archaeologist should be present when proposed boreholes are sited along the ridge on *Denmark* to ensure that no significance archaeological sites are destroyed. The archaeologist would be able to give the all clear to a particular location or request that a proposed borehole be relocated to a site where there would be no disturbance of the archaeological heritage.

Tasmin Pacific Minerals Limited point out that a drilling programme does not always result in mining. However, should it be decided to mine the area an Environmental Management Programme will need to be produced. The EMProgramme will need to include a comprehensive archaeological study of the area, including risks posed by the mining and mitigation measures. This is required prior to issuing a Mining Right.

A baseline archaeological survey of the two drill areas on the farm Groene Vallei (Site 37) identified evidence for Stone Age quarrying activities on the lower slopes of the koppie. While little is known about prehistoric quarrying of stone artefacts, the densest distribution of quarry activities occurs on the lower slopes of the koppie, below the drill areas.

- No mitigation is required during the prospecting phase on Groene Vallei. However it is recommended that this suggestion is re-assessed if mining takes place, in order to ensure that a sample of material is collected. See comments of regarding mining above.

There are no significant issues which would prevent prospecting on in the drill areas on Denmark and Groene Vallei. Finally, we advise that prospecting work should cease if any of the following are uncovered:

- Human remains/graves
- Concentrations of stone tools or faunal remains
- Stone walling or any sub-surface structures
- Fossils

If any of the above is uncovered, SAHRA should be notified so that an archaeologist/palaeontologist can investigate further.

## 10. REFERENCES

Parkington, J., Morris, D. & Rusch, N. 2008. Karoo rock engravings. Cape Town: Creda Communications.

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### Denmark Sites

Site Number	Lat/Lon°	Type	Description
02	S32 02 17.3 E25 22 55.7	Indeterminate	Few hornfels flakes on edge of ledge
03	S32 02 15.4 E25 22 53.7	LSA	Dense scatter of LSA artefacts, including large Smithfield endscrapers on grey hornfels (no pottery), situated on the edge of a newly constructed farm road near rocky ledge. About 30m x 30m in size, mainly flakes & chunks but some retouched flakes as well.
04	S32 02 14.9 E25 22 41.1	MSA	One very large weathered MSA type flake.
05	S32 02 23.4 E25 22 56.4	LSA?	Just outside the drill area, below the rocky ledge, one end scraper.
LSA 02	S32 02 12.3 E25 22 49.8	LSA	Scatter of LSA hornfels flakes above the ridge.
Stone Pile	S32 02 13.7 E25 22 51.2	Stone Pile/cairn?	Pile of stone, unsure if stone cairn or grave.

## Groene Vallei Sites

<b>Site Number</b>	<b>Lat/Lon°</b>	<b>Type</b>	<b>Description</b>
Stone Cairn	S32 04 50.2 E25 18 06.5	Cairn	A pile of rocks, possibly a cairn, located outside the drill area on GV south
06	S32 04 55.0 E25 18 04.7	LSA?	A number of unpatinated hornfels flakes on GV south, possibly representing a quarry site.
Quarrying	S32 04 41.6 E25 18 36.9	LSA?	A large number of chunks, cores and flakes which appear to have been recently flaked from hornfel boulders distributed down the slope of GV north. This appears to represent a quarry site.