

HERITAGE IMPACT ASSESSMENT FOR PROPOSED GRANITE PROSPECTING NEAR POFADDER, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of an EIA)

Prepared for

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EXECUTIVE SUMMARY

ACO Associates was appointed by Sizisa Ukhanyo Trading 830 cc to assess the potential impacts to heritage resources that might occur through granite prospecting and mining on farms between 40 km and 65 km northeast of Pofadder in the Northern Cape Province. The project was initially for an EMP submitted for the farm Yas 3, but other portions of land have been considered for prospecting and mining applications as well. They are:

- Yas 3 (new prospecting application – limited fieldwork conducted);
- Lower Zwart Modder No. 79 Remainder (new prospecting application – no fieldwork conducted);
- Lower Zwart Modder 79 / portion 1 (existing prospecting right, mining right application to come – fieldwork conducted); and
- Nous West 76 (existing prospecting right and four new 1.5 Ha mining permit applications – limited fieldwork conducted).

A brief field survey was carried out with the aim of understanding the landscape. It was not comprehensive, although certain areas were examined in greater detail when this seemed necessary and as time allowed.

The environment is arid and composed of two main types: granite hills and sandy plains. Many dry water courses cross the farms and vegetation is typically very sparse.

Palaeontological resources are likely to be sparse and would be completely absent from within the granites. Prehistoric archaeology has been documented in many areas and such resources can be expected to be widely distributed, although in variable densities. The historical period in this area generally only dates back to about 1900 and is usually farm-related.

No palaeontological resources were found. Pre-colonial archaeology was present in a number of areas but with highly variable density and significance. All included stone artefacts, some had pottery and ostrich eggshell and bone fragments were also occasionally preserved. In one area a number of grinding hollows were found in bedrock. Archaeological sites were most common in this area. Historical finds included several graves or possible graves, a stone animal trap and fragments of glass. Historical structures date to the early 20th century and their associated dumps appear to contain material not yet old enough to be protected by the NHRA. Cultural landscapes will not be impacted and no scenic routes are within close proximity of the proposed works.

The recommendations are split according to farm portions and proposed activities:

- Yas 3 (new prospecting application): The EMP can be approved and prospecting may proceed, provided that the graves must be protected from harm.
- Lower Zwart Modder 79 Remainder (new prospecting application): The areas to be prospected should be subjected to an impact assessment prior to approval of the EMP.
- Lower Zwart Modder 79/1 (existing prospecting right, mining right application in process): A mine plan indicating all areas to be disturbed (whether by mining, roads or buildings) should be submitted to an archaeologist for comment prior to approval of a mining right. Should no significant deviation from the areas already examined be apparent then it is likely that no further studies will be required.
- Nous West 76 (existing prospecting right and four new 1.5 Ha mining permit applications): Several important archaeological sites were found on this farm. An

archaeological impact assessment examining this area in more detail should be carried out. If the already known sites cannot be protected then they should be mitigated prior to approval of a mining right.

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1. INTRODUCTION

ACO Associates was appointed by Sizisa Ukhanyo Trading 830 cc to assess the potential impacts to heritage resources that might occur through granite prospecting and mining on farms between 40 km and 65 km northeast of Pofadder in the Northern Cape Province. Mining is already in progress in several areas but the prospecting is in order to allow for expansion of the mining areas. An Environmental Management Plan (EMP) has been prepared for the farm Yas No. 3, and submitted to the Department of Mineral Resources (DMR). Prior to approval of the Yas 3 EMP, the DMR sought comment from the South African Heritage Resources Agency (SAHRA) on the heritage aspects. SAHRA in turn requested a heritage impact assessment (HIA) that should specifically address the possible impacts to archaeology and palaeontology. The present report aims to fulfil this request for Yas 3. It should be noted that other portions of land were included in the assessment at the request of the client such that all the portions being considered here are as follows:

- Yas 3 (new prospecting application – limited fieldwork conducted);
- Lower Zwart Modder No. 79 Remainder (new prospecting application – no fieldwork conducted);
- Lower Zwart Modder 79 / portion 1 (existing prospecting right, mining right application to come – fieldwork conducted); and
- Nous West 76 (existing prospecting right and new 1.5 Ha mining permit application – limited fieldwork conducted).

The farms are indicated on Figure 1, as are the approximate locations of all the areas studied. The mining areas were numbered but, for convenience, the new areas with no current mining were added to this to result in 11 areas, of which three existing mining areas (1-3) are linked into one larger area. These study areas are shown on Figure 1.

The planned prospecting activities range from the drilling of 38 mm diameter bore holes to the bulk sampling of granite blocks of up to 9 m³ in volume. It is only really at the bulk sampling stage that visual disturbance of the granites would become apparent.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains older than 60 years and located outside of a formal cemetery administered by a local authority (Section 36) and non-ruined structures older than 60 years (Section 34). Landscapes with cultural significance are also protected under the definition of the National Estate (Section 3 (3.2d)). Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Since the project is subject to the approval of an Environmental Management Plan (EIA), SAHRA is required to provide comment on the proposed project in order to facilitate final decision making by the DMR.

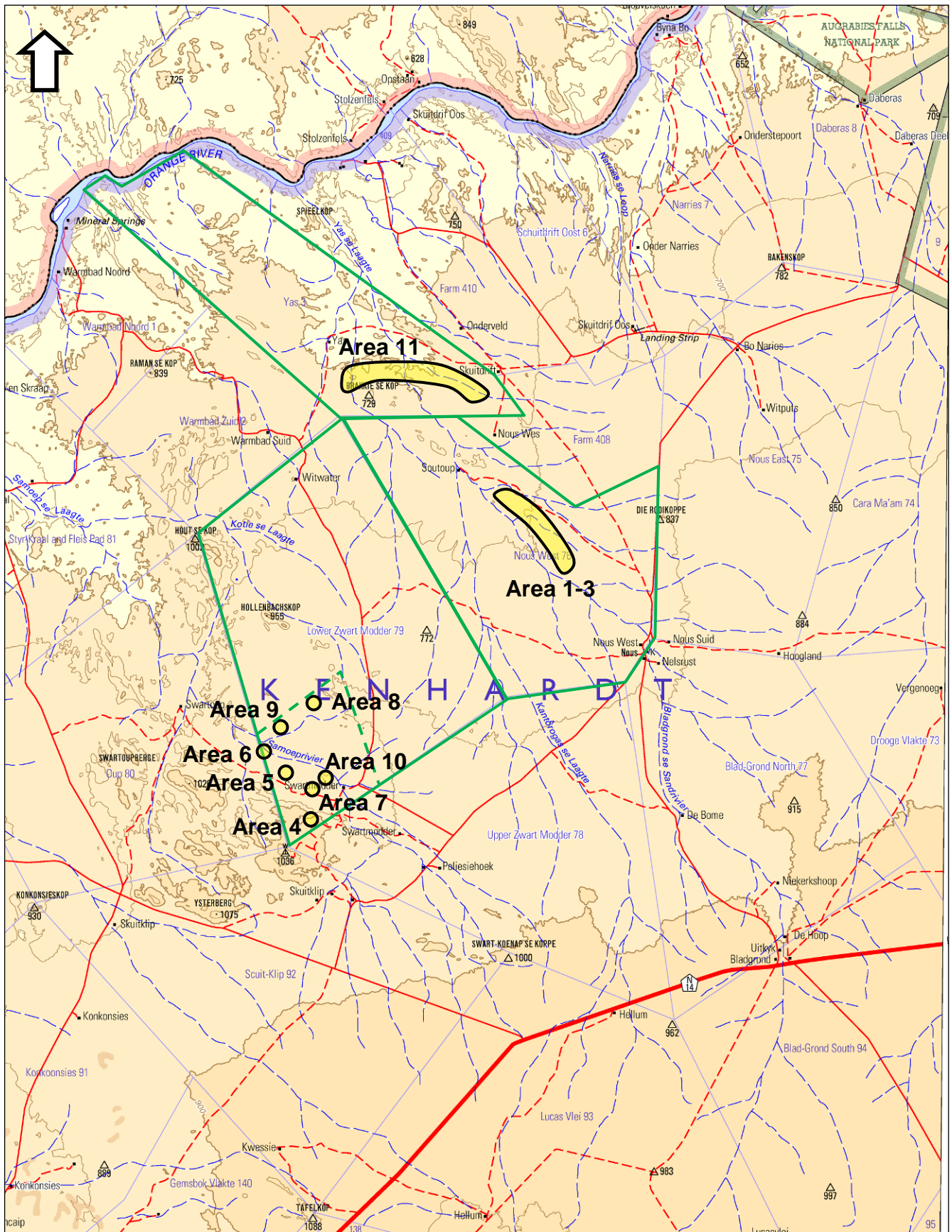


Figure 1: Map showing the locations of the three farms. The approximate extent of 79/1 is outlined with a dashed green line and the various areas examined are indicated by the yellow-filled black shapes.

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context of the area in which the proposed prospecting was to be undertaken. This literature included published material and unpublished commercial reports. The information so gained was used to inform the field survey.

3.2. Field survey

Two days (24th and 25th November 2012) were spent on site examining the various locations indicated to us. The landscape and heritage resources were recorded photographically and GPS co-ordinates were taken to locate the latter. It should be noted that the fieldwork was carried out with the aim of assessing prospecting applications and it was only upon our return that we were made aware that some areas were in fact to be the subject of mining applications. Our survey was thus aimed primarily at understanding the pre-colonial landscape.

3.3. Limitations

The study area was very large and could not be examined comprehensively due to the extra demands made of our time on site. Some areas commented on in this report were not examined at all. However, given the nature of the landscape, it was found to be relatively easy to predict where significant resources (primarily archaeological sites) would be located and it is felt that the survey accomplished the goal it set out to do and that its findings are robust.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The general area is composed of granite hills surrounded by wide open plains. All the individual study areas were within the granite hills and were generally very rocky. In places the sandy plains extend right up to the base of the rocks, in others dry stream beds cut through the hills or flow past them leaving alluvial fans in many areas. Vegetation cover is very minimal with sporadic trees being located along the rivers where underground water is most reliable. Figures 2 to 10 show the nature of the receiving environment in several of the study areas.



Figure 2: One of the silty fans located within Area 11.



Figure 3: One of the stream beds cutting through the rocky hills in Area 11.



Figure 4: General view from a high hill within Area 11.



Figure 5: View of the terrain in Area 8.

Several areas have already been subjected to mining in the past, though some clearly have been out of use for some time. These latter areas have had very little disturbance overall. In other areas the current mining has resulted in disturbance to surrounding areas. In area 1-3, in particular, we noticed several such recently disturbed areas (Figures 8 and 9).



Figure 6: View of Area 9 with a small existing mining area to the left.



Figure 7: View over Area 6 with a large disturbed area in the centre from the existing mining operations.



Figure 8: Disturbed area in Area 1-3 alongside a newly built access road.



Figure 9: Disturbed area in Area 1-3 with rubble and granite blocks pushed from the top of the hill.

5. HERITAGE CONTEXT

5.1. Palaeontology

It is well known that fossil resources are absent from granitic rocks and this is expected to be the case here. Almond and Pether (2008) note the Namaqua-Natal Metamorphic rocks to

have no palaeontological significance, since no fossils have yet been recorded in them. However, water-laid deposits around the granite outcrops can include relatively recent fossils.

5.2. Pre-colonial archaeology

In general, the archaeology along the Orange River has only been well studied in two areas, the Richtersveld and the Middle Orange River area. However, some research (during the 1970s and 1980s) and a number of cultural resource management (CRM) studies have been conducted in and around the Augrabies National Park which lies some 45 km east of Area 11. This work demonstrates that there are important heritage sites located in the region. Existing reports are summarised here.

Zoovoorbij, a cave some 64 km east of Augrabies, was excavated by Smith (1995). He found a Middle Stone Age (MSA) deposit with MSA flaked stone artefacts underlying a Later Stone Age (LSA) deposit. The latter included stone artefacts, bone beads, ostrich eggshell beads and a few potsherds. Among the stone artefacts were scrapers and miscellaneous retouched pieces. Dating revealed a strong pulse of occupation spanning 4140 ± 70 BP (Pta-2889) at the base of the LSA to 2800 ± 60 BP (Pta-2870) near the top.

Morris and Beaumont (1991) reported on the excavation of two Stone Age archaeological sites on Renosterkop, immediately east of the town of Augrabies. At Renosterkop 1 they found an open LSA scatter of stone artefacts, pottery, ostrich eggshell beads and other materials. The stone was predominantly informal though a few retouched items (scrapers and backed tools) were present. Grindstones occurred and included one stone of the sort described by Webley (1990) for use in scraping skins. The pottery was thin walled and decorated with incised horizontal lines and tear-drop-shaped impressions. Most sherds had mineral temper but a few were tempered with grass. The beads were mostly small, but did include a few far larger examples. Two square metres were excavated from Renosterkop 2, a small rock shelter. It contained modern material in the upper deposits with material similar in character to Renosterkop 1 occurring below. MSA artefacts occurred at the base but the interface between the LSA and MSA was unclear and the deposits were poorly stratified. Through comparison with other sites, Morris and Beaumont (1991) consider the LSA material to relate to a late phase of herder occupation.

Smith (1986) mentions a site near Augrabies Falls that contained pottery, sheep bones and an informal stone artefact assemblage with just one scraper among 1000 flaked artefacts. The site was dated to 760 ± 40 BP (Pta-3847) and is said to have been occupied by herders. He later names this site Waterval 1 and claims five miscellaneous retouched pieces and no scrapers among 827 artefacts (Smith 1995). Beads, a decorated flask mouth fragment and thin-walled pottery were also found. The latter were grit-tempered and included impressed decoration and lugs. Several other sites in the same area, no doubt similar in character, have recently been recorded along the silty terraces of the Orange River (Orton & Webley 2012).

Away from the river recent surveys have found that LSA sites, dominated primarily by quartz flakes, tend to occur around the base of granite koppies (Halkett 2010; Morris 2011a, 2011b, 2011c; Pelsler 2011). Well to the south, far from the Orange River, Smith (1986) has also excavated a site called Droëgrond. It was occupied repeatedly during the last few hundred years with the proximate permanent water source no doubt the main attraction. He ascribed the site to a hunter-gatherer occupation. Other sites even further south into the Karoo and Bushmanland have also been studied but are less relevant here.

All these studies have resulted in the separation of two seemingly distinctive industries that are termed “Swartkop” and “Doornfontein”. The former are said to be related to occupation by hunter-gatherers and to occur away from large water courses, while the latter were said to be from herders and to cluster along the banks of the Orange River and its larger tributaries (Beaumont & Vogel 1984).

Parsons (2007) has recently worked on assemblages excavated from sites in the Augrabies Falls area by Peter Beaumont in past decades. These include Biesje Poort 2 and Bokvasmaak 3, both to the north of the Augrabies Falls. Beaumont *et al.* (1995) provide dates of 1390 ± 70 BP (Pta-4772) and 120 ± 50 (Pta-4872) for the two sites respectively. Biesje Poort 2 in particular contained numerous retouched items with many different types represented. Both sites had been ascribed to herders by Beaumont *et al.* (1995) but Parsons' (2007) analyses showed the relevant characteristics to be blurred and unreliable.

Aside from these occurrences, “thousands of square kilometres of Bushmanland are covered by a low density lithic scatter” (Beaumont *et al.* 1995:240). Most of these artefacts are likely to relate to the MSA but Early Stone Age (ESA) and LSA artefacts will also be present.

A type of feature not widely known from the interior of South Africa is bedrock grinding hollows. These are areas on exposed granite outcrops where people have smoothed the surface through grinding with an upper grindstone. In many parts of Bushmanland decent quartzite cobbles/slabs are not present and bedrock is the only possible option for making lower grindstones. The upper grindstones may well have been carried in from a long way off and removed when the sites were abandoned. These bedrock grinding grooves have recently been documented in other parts of Bushmanland to the southwest (Orton & Webley 2012b, 2012c) as well as within the bounds of the Augrabies National Park to the east (Anonymous 2001; Orton & Webley 2012a).

Also potentially relevant in the vicinity is the possibility of finding circular stone structures constructed by the pre-colonial occupants of the area. While such structures are found throughout much of the Karoo, they are less well documented in this region. However, on the farm Bloubos to the north of Augrabies Falls, several have been described (Parsons (2004).

5.3. Graves and human remains

Many human skeletons have been exhumed from the area between Augrabies Falls and Upington, both by Dreyer and Meiring (1937) and by Alan Morris (1995). Eighteen came from close to Augrabies Falls. The burial cairns and other information suggested Khoekhoen people, specifically the Einiqua, and historical data shows the majority of graves to date to the 18th and early 19th centuries (A. Morris 1995). A recent survey to the west of the Augrabies Falls also found one large presumed burial cairn in that area (Orton 2012). Alan Morris (pers. comm. 2012) suggests that the graves were shallow and the cairns varied in size with those of women and children generally being smaller than those of men. While confirmed stone cairn graves have not been documented well downstream of Augrabies Falls, the possibility should nonetheless be borne in mind. Morris (2010) did find two stone cairns near the Gamsberg that he suspected could be graves.

Farm graveyards and other historic graves are present on many farms in the rural parts of South Africa. The SA Military History website indicates that military graves are present on many farms in the Pofadder, Kakamas and Keimoes areas (The South African Military History Society n.d.). A large number of these graves probably pertain to the Anglo-Boer War.

5.4. Colonial period and the built environment

The colonial footprint in this area tends to be extremely light with farm houses generally dating to the early 20th century. Most farms were only granted in the years just before or after 1900. An Anglo-Boer War fort is known in the Augrabies National Park (Anonymous 2001).

6. FINDINGS

6.1. Palaeontology

As expected, no palaeontological material was observed and none of significance is expected in the area. Certainly, none will be impacted by drilling into bedrock.

6.2. Archaeology

Despite the many areas examined, relatively few archaeological resources were identified. The majority were in areas close to potential water sources – sources which no doubt would have been available to people during the summer months after rain storms. Table 1 provides a full listing of heritage resources encountered during the survey, while Figures 10 to 13 map them. A few examples of the sites are described and illustrated below.

6.2.1. Later Stone Age

Much of the archaeology found took the form of artefact scatters. At LZM2012/001 there was a small rock shelter that had been the focus of occupation (Figure 14). No obvious water sources occur nearby suggesting that it was the shelter that was of value, perhaps to groups of people passing through the area en route from the Orange River to other areas inland. An extensive LSA artefact scatter occurred outside the front of the shelter and included quartz, cryptocrystalline silica (CCS), fine-grained black rock (FGB), quartzite, pottery, ostrich eggshell (OES) fragments, and a lower grindstone fragment. Many of the flaked artefacts displayed cobble cortex indicating a source from a river, presumably the Orange River. This site is not in any of the prospecting areas and was merely included here for the record.

At YAS2012/002 there was an ephemeral scatter of LSA quartz flakes alongside a dry stream bed. Similar flakes had been noted in lower densities along the same valley and no doubt these artefacts indicate sporadic human use of this valley during the LSA. A similar scatter occurred at YAS2012/003, but a single quartzite flake struck from a river cobble was also present on the site.

One of the more impressive artefact scatters was located at NSW2012/001. Here we found LSA flaked stone artefacts of quartz, silcrete, quartzite and CCS (Figure 17). Two MSA flakes were also included but these would likely have been background scatter. Also on the site were fragments of undecorated pottery, bone and OES. Sadly, this site has been disturbed by current mining activities. It appears as though cut granite blocks have been pushed over the edge of the outcrop and then collected from below. Although the integrity of the site is lost, it would still be possible to make a collection of value since organic material is also present and a good number of artefacts would likely be obtained. Figure 9 above shows the location of the site.

Table 1: List of heritage resources. The short field numbers are indicated in the mapping for convenience, but official site numbers have been allocated here. An estimate of the time that would be required at each site for mitigation purposes is indicated in the significance column. This does not mean that all these sites require mitigation, but is merely there for indicative purposes.

Site number	Field number (Area)	Location	Type	Description	Significance MITIGATION
LZM2012/001	019 (n/a)	S28 45 34.7 E19 42 34.4	Rock shelter / artefact scatter	Artefact scatter in front of a small rock shelter. Qtz, CCS, FGB, Qz, pottery, OES, LG frag, many flakes from cobbles.	Medium (may have had material stolen from it) MITIGATE (4-5 hrs)
YAS2012/001	067 (Area 11)	S28 37 18.8 E19 41 43.9	Stone feature	Packed stone feature, possibly a grave. Clear glass alongside.	High (if grave) AVOID OR TEST/EXHUME
	068 (Area 11)	S28 37 18.0 E19 41 43.9	Stone feature	Stone feature (not well packed, probably not a grave). Dark glass alongside.	High (if grave) AVOID OR TEST/EXHUME
	069 (Area 11)	S28 37 17.9 E19 41 43.4	Stone feature	Packed stone feature, possibly a grave.	High (if grave) AVOID OR TEST/EXHUME
n/a	070 (Area 1)	S28 38 03.5 E19 44 55.7	n/a	Occasional quartz artefacts in this valley.	n/a
YAS2012/002	071 (Area 11)	S28 38 04.0 E19 44 59.2	Artefact scatter	Ephemeral quartz scatter alongside river.	Very low
YAS2012/003	072 (Area 11)	S28 38 12.8 E19 45 14.3	Artefact scatter	Ephemeral quartz scatter and one quartzite cobble flake.	Very low
n/a	073 (n/a)	S28 38 29.2 E19 46 07.2	Historical dump	Two 20 th century dumps but perhaps including a few early 20 th century items (not protected).	Very low
YAS2012/004	074 (n/a)	S28 38 29.9 E19 46 09.5	Structures	Yas farm complex, mostly recent but some may be early-mid-20 th century.	Low
NSW2012/001	075 (Area 1)	S28 40 18.5 E19 46 14.2	Artefact scatter	Large artefact scatter in a 'bay' at the foot of the cliff below the mine. Very disturbed but could still be rescued as the original context (i.e. surface scatter) has not been changed – spatial data will have been lost though. Qtz, Qz, CCS, pottery, bone, OES. Two MSA flakes.	Medium-high MITIGATE (4-5 hrs)
NSW2012/002	076 (Area 1)	S28 40 18.9 E19 46 15.0	Artefact scatter	Quartz and CCS scatter as above. Smaller, but much less disturbed.	Low-medium MITIGATE (1hr)
NSW2012/003	077 (Area 1)	S28 40 20.0 E19 46 16.9	Artefact scatter (?deposit)	Qtz, CCS, Qz, FGB, bone, OES. Possibly a small deposit at the foot of the cliff.	Medium-high MITIGATE (4-16 hrs)
n/a	078 (Area 1)	S28 40 21.7 E19 46 04.8	n/a	One clear and at least two possible grinding hollows in bedrock.	Low
n/a	079 (Area 1)	S28 40 22.0 E19 46 04.0	n/a	One large grinding hollow.	Low
n/a	080 (Area 1)	S28 40 20.5 E19 46 03.2	n/a	One probable grinding hollow.	Low

Site number	Field number (Area)	Location	Type	Description	Significance MITIGATION
n/a	081 (Area 1)	S28 40 19.8 E19 46 03.2	n/a	One clear and four probable grinding hollows.	Low
NSW2012/004	082 (Area 1)	S28 40 19.4 E19 46 03.3	Artefact scatter	Qtz, Qz, CS, agate, pigment, pottery, tooth fragment.	Low-medium MITIGATE (2 hrs)
NSW2012/005	083 (Area 1)	S28 40 18.6 E19 46 03.4	Artefact scatter	Qtz, Qz, CCS, OES, pottery (lots including a complete externally applied lug). A small ashy deposit seems to be present at foot of small cliff. Excellent site, undisturbed.	High MITIGATE (6-10 hrs)
NSW2012/006	084 (Area 1)	S28 40 17.6 E19 46 03.3	n/a	About nine grinding hollows.	Low-medium
NSW2012/007	085 (Area 1)	S28 40 16.9 E19 46 03.5	n/a	About seventeen grinding hollows.	Low-medium
LZM2012/002	086 (n/a)	S28 48 05.1 E19 41 42.8	Structure	Early 20 th century house (1930s-1940s).	Low
LZM2012/003	087 (Area 7)	S28 48 14.7 E19 40 51.9	Rock shelter / artefact scatter	Quartz, burnt bone, OES (some burnt), UG. Ephemeral scatter.	Low
LZM2012/004	088 (n/a)	S28 48 15.5 E19 41 35.3	Graveyard	Six graves, Claassens 1900, Jordaan 1938, Claassens 1942, Classens 1942, Spanneberg 1945, no headstone (?empty).	High AVOID
NSW2012/008	090 (Area 1)	S28 40 37.3 E19 46 43.5	Artefact scatter	Quartz scatter in open area alongside granite outcrop. SE-facing.	Low
NSW2012/009	091 (Area 1)	S28 40 36.1 E19 46 44.0	Artefact scatter	Quartz (LSA) and ?quartzite (MSA) scatter in open area in front of outcrop/boulders. SE-facing.	Low
NSW2012/010	092 (Area 1)	S28 40 35.9 E19 46 43.2	Artefact scatter	Quartz and quartzite (LSA) and ?quartzite (MSA) scatter in open area in front of outcrop/boulders. N-facing.	Low
NSW2012/012	093 (Area 1)	S28 40 34.3 E19 46 42.2	Artefact scatter	Quartz and CCS (LSA) and ?quartzite (MSA) scatter in open area in front of outcrop/boulders. NW-facing. LSA tends to be higher on slope and MSA in/near erosion gulley at base of slope.	Low
NSW2012/013	094 (Area 1)	S28 40 35.2 E19 46 40.2	Artefact scatter	Quartz (LSA) and ?quartzite (MSA) scatter in open area in front of outcrop/boulders. SE-facing	Low

Site number	Field number (Area)	Location	Type	Description	Significance MITIGATION
NSW2012/014	095 (Area 1)	S28 40 31.4 E19 46 39.9	Artefact scatter	Quartz and FGB (LSA) and ?quartzite (MSA) scatter.	Low
NSW2012/015	096 (Area 1)	S28 40 26.2 E19 46 26.9	Artefact scatter	Long, low shelter with qtz, qz, CS, FGB, ?HF on huge talus in front of shelter.	Low-medium MITIGATE (3 hrs)
NSW2012/016	097 (Area 1)	S28 40 24.6 E19 46 25.3	Rock shelter / artefact scatter	Tiny cave in gully with light artefact scatter outside. Qtz, qz, FGB, OES, UG.	Low
NSW2012/017	098 (Area 2)	S28 41 36.8 E19 47 31.4	Rock shelter / artefact scatter	Cave with light scatter outside. Qtz, qz, FGB, CCS.	Low
YAS2012/005	L001 (Area 11)	S28 37 17.0 E19 42 37.7	Historic kraal	Possible but doubtful stone walling around the front of a small overhang.	Low
YAS2012/006	L002 (Area 11)	S28 36 51.2 E19 41 45.0	Historic grave	Neatly packed grave of granite blocks with single headstone. No inscription. Tree growing out of grave. Located in a small valley. 2m x 1m dimension	High AVOID
	L003 (Area 11)	S28 36 52.6 E19 41 44.9	Historic stone trap	Stone trap or "tierhok/wolfhok" made of slabs of granite. Used by herders to catch small carnivores	Low
NSW2012/018	L004 (Area 1)	S28 40 23.2 E19 46 24.8	Historic grave	Roughly packed grave of large weathered granite. A possible headstone. 2 x 1.5m in dimension	High AVOID
	L005 (Area 1)	S28 40 23.3 E19 46 24.8	Historic grave / stone cairn	Some 3m from L004 is a circular (80cm – 1m) diameter pile of rocks. Its proximity to the grave suggests it may be a grave too?	High AVOID

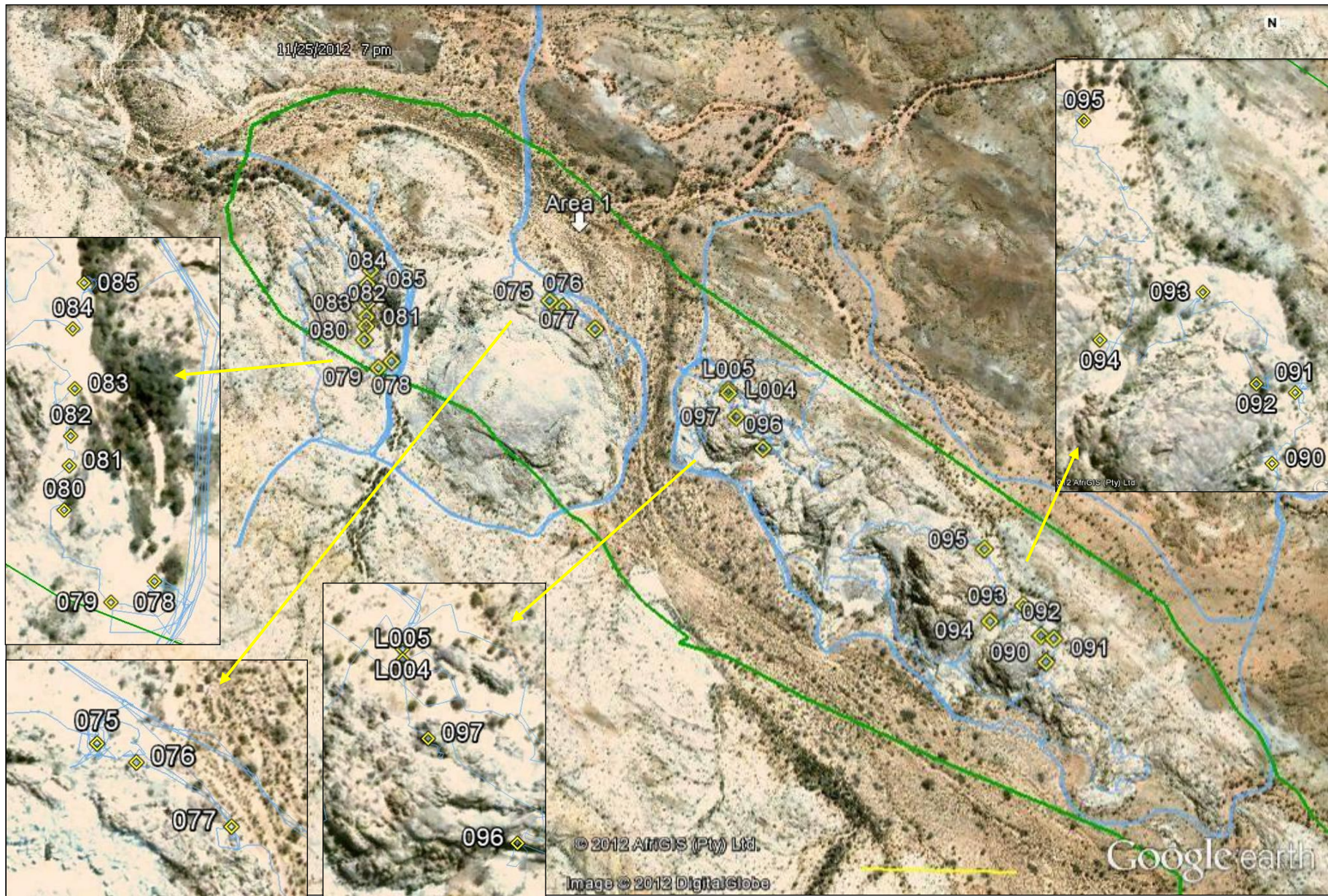


Figure 10: Aerial view of Area 1 showing the locations of heritage resources. The yellow bar for scale at lower right is 250 m long. Green line = approximate outline of prospecting area, blue lines = walk/drive paths.

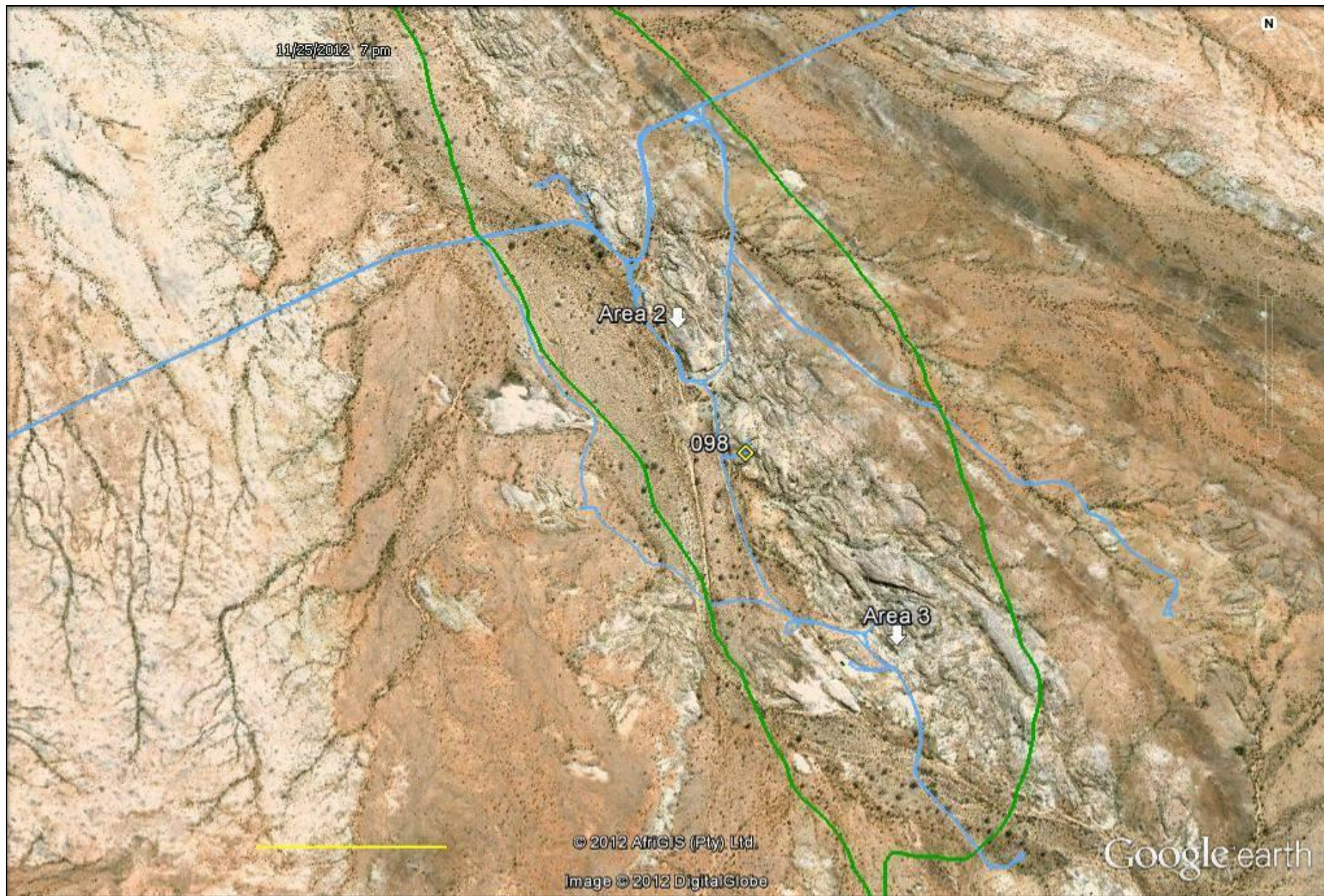


Figure 11: Aerial view of Areas 2 and 3 showing the locations of heritage resources. The yellow bar for scale at lower left is 500 m long. Green line = approximate outline of prospecting area, blue lines = walk/drive paths.

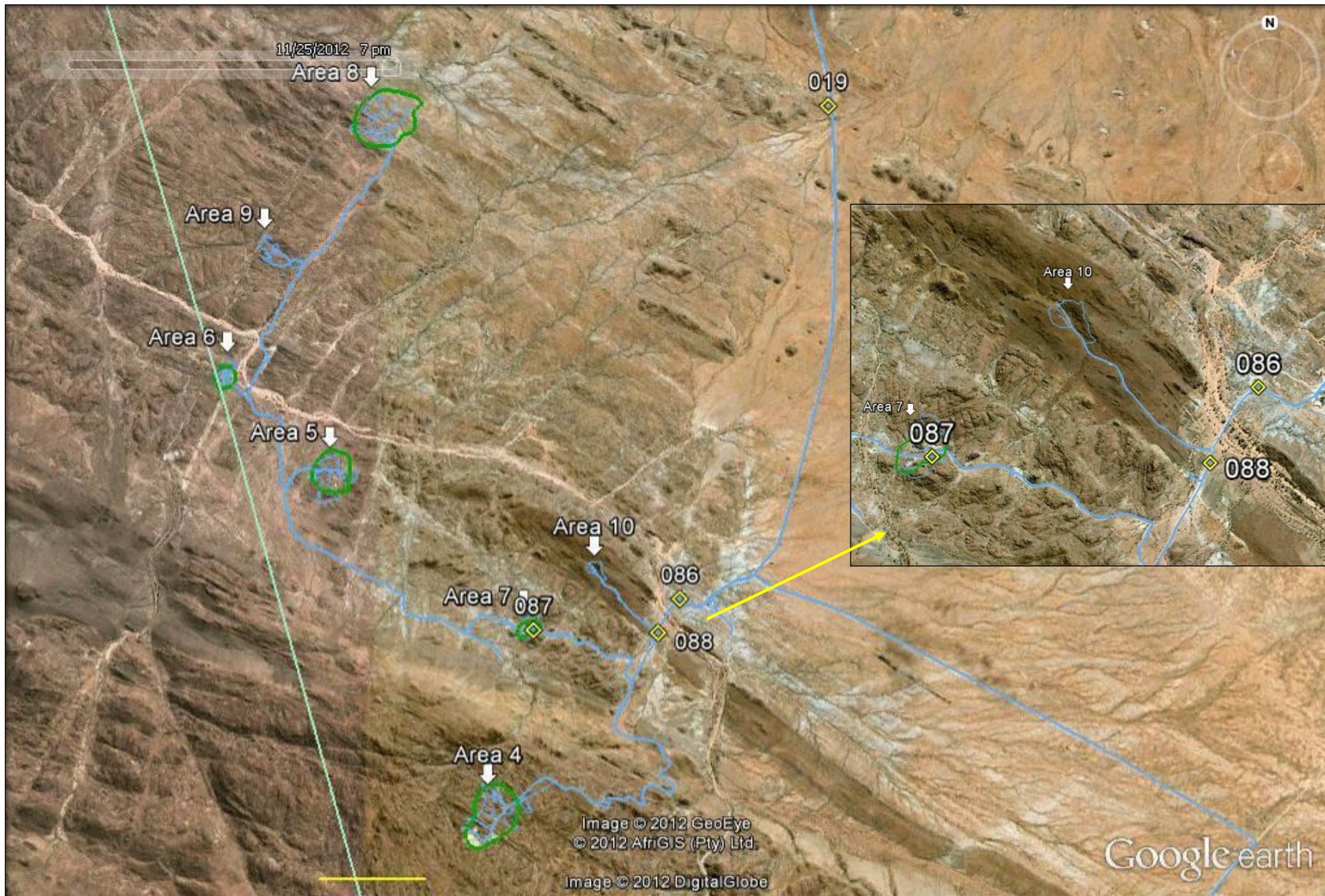


Figure 12: Aerial view of Areas 4 to 10 showing the locations of heritage resources. The yellow bar for scale at lower left is 1 km long. Green lines = approximate outline of prospecting area, blue lines = walk/drive paths.

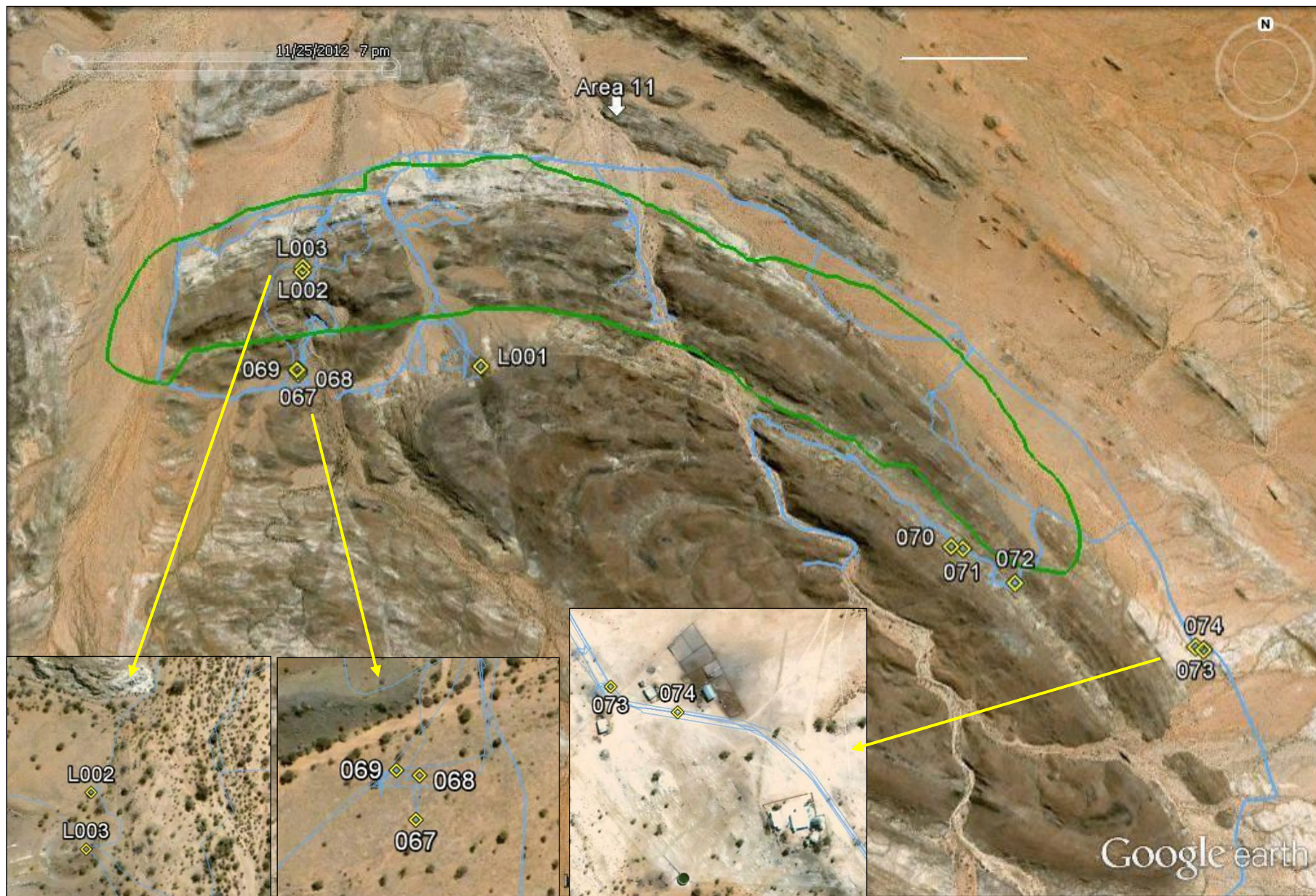


Figure 13: Aerial view of Area 11 showing heritage resources. The white bar for scale at upper right is 1 km long. Green line = approximate outline of prospecting area, blue lines = walk/drive paths.

Some 20 m to the southeast there was a smaller scatter of similar artefacts that had not been disturbed (NSW2012/002, point 076), while a further 60 m to the southeast was another site, also at the foot of the cliff, but totally undisturbed and possibly containing a small deposit (Figure 18).



Figure 14: A small rock shelter at LZM2012/001 (point 019).



Figure 15: Stone artefacts in quartz from the scatter at YAS2012/002 (point 071). Scale in cm.



Figure 16: Opposite sides of a broken quartzite flake with cobble cortex from YAS2012/003 (point 072).



Figure 17: Stone artefacts, pottery, bone and ostrich eggshell fragments from NSW2012/001 (point 075). The two flakes on the far right are older, probably pertaining to the MSA. These would be background scatter.



Figure 18: The location of NSW2012/002 (point 076) at the foot of the cliff.

The most significant Stone Age archaeological site found was at NSW2012/005. The site is also an open scatter of artefacts but it is located in front of a low granite outcrop immediately alongside a small water course (Figure 19). Artefacts of quartz, quartzite and CCS occur, along with fragments of OES, and plenty of pottery. The pottery includes a complete, externally applied lug which must have fallen off its pot (Figure 21). A small ashy deposit seems to be present at the foot of the granite outcrop. This site is entirely undisturbed and is very well suited to excavation. Another similar but slightly less extensive site was located about 25 m to the south (NSW2012/004).



Figure 19: View of the location of NSW2012/005 (point 083). The artefacts are on the gentle slope on the left side of the photograph. The granite slabs in the right hand background contain the grinding hollows recorded as NSW2012/006 and NSW2012/007.



Figure 20: Artefacts from NSW2012/005 (point 083). At lower left is the pot lug and at upper centre are four OES fragments. Scale in cm.



Figure 21: The pot lug from NSW2012/005 (point 083).

Immediately to the north of these two sites was an area of exposed granite bedrock in the stream bed (Figure 22). On this bedrock we found a number of grinding hollows / grooves in two clusters. The southern cluster (NSW2012/006) had nine grinding hollows, while the northern cluster (NSW2012/007) had seventeen grinding hollows (Figure 23). The hollows are generally difficult to spot and one has to use the sunlight at a particular angle in order to get them to show up. However, upon feeling them, one can soon appreciate that they have been ground smooth. A few patches of rock to the south of the two archaeological sites just discussed also had grinding hollows on them. However, each only had one clear one and a few probable/possible examples (these were not recorded as sites but rather as isolated finds). Figure 24 shows what is probably the clearest example.



Figure 22: The location of the grinding hollows at NSW2012/007 (point 085).



Figure 23: Some of the grinding hollows at NSW2012/007 (point 085).



Figure 24: One of the very clear grinding hollows (circled), this one an isolated example from point 081.

6.2.2. Graves / Stone features / Ruins

Several small stone features were located during the survey. Some of these are almost certainly graves (Figures 25 to 27). At YAS2012/001 we found three features that seemed spatially related – the two furthest apart were 32 m from one another. It is difficult to know for certain what these features represent, but that they might be graves is a strong possibility. If so, they would likely be graves of early farmers/herders in the region, in this case perhaps dating back only to the late 19th century, just before farms were granted and, perhaps, houses were built. Alongside two of the features (067 and 068) were glass fragments. One had clear glass and the other dark green bottle glass. The latter, in particular, was typical of historical wine bottles found widely in South Africa and must date back to at least the early 20th century (Figure 28).



Figure 25: The stone feature at YAS2012/001 (point 68). A second feature is visible in front of the vehicle (point 069).



Figure 26: The second stone feature at YAS2012/001 (point 067).



Figure 27: The second stone feature at YAS2012/001 (point 069).



Figure 28: The wine bottle base found with the 068 stone feature at YAS2012/001.

Another cluster of two stone features was found at YAS2012/006. One, like those described above, is almost certainly a grave. It is better packed than the others (Figure 29). A tree was growing out of the top of it which unfortunately made it difficult to photograph. Very nearby, 40 m to the south, was a stone animal trap of the sort commonly built in the early days of farming in South Africa. It would have been used to trap caracul, or similar predators that would have attacked small livestock.



Figure 29: The grave at YAS2012/006 (point L002).



Figure 30: The stone animal trap at YAS2012/006 (point L003).

6.3. Built environment

These farms tended to have very few structures on them, aside from modern structures associated with the mining activities. Nevertheless, a few protected structures were located. At YAS2012/004 is a farm complex on the farm Yas. They include a set of labourers' cottages that were built from locally made, sun-dried bricks. These likely date to the early to mid-20th century. Nearby was a newer house. Other houses lie to the north on the farm but were not visited. At LZM2012/002 lies the farm complex on Lower Zwart Modder. While all structures are 20th century, some are clearly greater than 60 years of age. Associated dumped material is all too young for protection by the NHRA.



Figure 31: Houses at YAS2012/004 (point 074). They date to the early to mid-20th century.



Figure 32: Close up of one of the YAS2012/004 houses showing its construction to be of locally made, sun-dried bricks.



Figure 33: House at LZM2012/002 (point 086). This house probably dates to the 1940s.



Figure 34: Outbuilding of decorative breeze blocks at LZM2012/002 (point 086). It is likely also 1940s in age.

6.4. Cultural landscapes

The local landscape is very much undeveloped such that its cultural “layer” is very ephemeral. Most of the farms in this area were granted very late, around the start of the 20th century, and thus their historical use does not go back very far. Livestock raising is the predominant activity and this leaves little trace on the landscape. The archaeological landscape is very much focused on certain features and no discernible cultural landscape is present.

6.5. Scenic routes

The proposed prospecting areas are very remote and not visible from any major roads. The N14 is some 14.6 km away from the southernmost mining area and the scale of the landscape and of the mining means that the latter is completely invisible from the N14. As such, all prospecting activities will be equally invisible.

7. ASSESSMENT OF IMPACTS

Note that since the original project aimed to assess the impacts that might be caused by prospecting, the assessments presented here relate only to prospecting activities and NOT to mining. Mining would result in greater areas being disturbed and would result in greater impacts to archaeological resources. One would need to know the extent of both the mining and all other ancillary activities before an accurate assessment of mining-related impacts could be made.

7.1. Palaeontology

Impacts to palaeontological resources will not occur where drilling is to take place on exposed bedrock. The chances of encountering and impacting on significant palaeontological resources buried beneath unconsolidated surficial deposits while accessing the prospecting areas is considered to be negligible.

7.2. Archaeology

Archaeological resources are not widely distributed in the landscape. However, it is noted that pre-colonial resources are very strongly tied to certain locations or landscape features, usually those that provide shelter or water. Some pre-colonial archaeological resources of medium to high significance and some graves were located in Area 1 (Figure 35), while some graves and likely graves were located in Area 11 (Figure 36). Prospecting will likely impact on very few significant archaeological resources but those that have been identified around Area 11 must be protected while all graves and possible graves should be avoided completely. Some archaeological sites are under threat from current mining activities and one has already been directly impacted (Figure 35). Table 2 assesses the expected impacts of the proposed prospecting activities both before and after mitigation. The significant sites identified within the prospecting areas are highlighted in Table 3. Note that two possible actions are available for archaeological sites and it is recommended that the prospecting EMP include provision for full protection for these sites until such time that they might need mitigation for mining purposes. It should be noted that the existing source of impact to NSW2012/001 (point 075) should be terminated so as to protect the site henceforth.

Table 2: Assessment of archaeological impacts.

	Before mitigation	After mitigation
Extent	Site	Site
Intensity	High	Negligible
Duration	Permanent	Permanent
Probability	Probable	Improbable
Significance	High	Very low
Status	Negative	Negative
Reversible	No	
Cumulative impacts	Little is known of the archaeological resources in the area but it is likely the many more similar sites will be present throughout the wider area. Cumulative impacts are thus not considered an issue at this stage.	

Table 3: Significant archaeological sites falling within or very close to prospecting areas and requiring protection or mitigation.

Site	GPS points	Location	Action
NSW2012/001	075	S28 40 18.5 E19 46 14.2	1. Protect 2. Mitigate (4-5 hrs)
NSW2012/002	076	S28 40 18.9 E19 46 15.0	1. Protect 2. Mitigate (1 hr)
NSW2012/003	077	S28 40 20.0 E19 46 16.9	1. Protect 2. Mitigate (4-16 hrs)
NSW2012/004	082	S28 40 19.4 E19 46 03.3	1. Protect 2. Mitigate (2 hrs)
NSW2012/005	083	S28 40 18.6 E19 46 03.4	1. Protect 2. Mitigate (6-10 hrs)
NSW2012/015	096	S28 40 26.2 E19 46 26.9	1. Protect 2. Mitigate (3 hrs)
NSW2012/018	L004 & L005	S28 40 23.3 E19 46 24.8	Avoid.
YAS2012/006	L002 & L003	S28 36 51.2 E19 41 45.0 S28 36 52.6 E19 41 44.9	Avoid



Figure 35: Aerial view of Area 1 showing significant archaeological resources that need protection and/or mitigation.



Figure 35: Aerial view of Area 11 showing significant archaeological resources that need protection and/or mitigation.

Should any of the archaeological resources ever be in the way of mining then they will require mitigation in the form of controlled archaeological excavation. Also, should their protection from further harm not be guaranteed then they should be mitigated to prevent further loss of archaeological research potential. Estimates of the number of hours required on each site are provided in Tables 1 and 3. This would need to be conducted under a permit issued by SAHRA. It should also be noted that if any areas are selected for expansion of mining activities then these should be subjected to a comprehensive impact assessment, since the present study has served more to locate those areas likely to be most significant. It is quite likely that other areas will contain archaeological resources that will also require mitigation.

It should be noted that all graves and possible graves should be avoided during prospecting and mining. Should the need to remove any graves ever arise then a full public participation process will need to be commenced. This can be a time-consuming process and it is certainly best to avoid all graves completely.

7.3. Other impacts

No impacts to built environment, cultural landscapes or scenic routes are expected.

8. CONCLUSION AND RECOMMENDATIONS

This report was originally commissioned as part of a single EMP application but, at the request of the client, we have briefly assessed several areas with a view to the report being used for other applications to DMR. As such, the recommendations are broken into different components. It must be noted that the fieldwork for this project was never intended to be a detailed survey but aimed only to predict the likely impacts to archaeological resources from prospecting activities. Larger scale mining would result in a different set of impacts and it was noted during our visit that areas around the granite domes were used for various ancillary activities including storage of granite blocks and that buildings and roads have been (and are still being) constructed (e.g. Figure 36). These areas are generally selected as they are level and archaeological resources are far more likely to be found in such areas as was demonstrated at Area 1 on Nous West.

8.1. Yas 3: new prospecting application

Very few archaeological resources appear to be located in this vicinity. So long as the graves and suspected graves are protected from harm, there is no objection to prospecting proceeding on this farm. However, should mining become desirable in the future, then an archaeological impact assessment will need to be conducted in and around those areas to be mined as there is certainly potential for archaeological heritage to exist in this area.

8.2. Lower Zwart Modder 79 Remainder: new prospecting application

This area was not inspected at all. However, based on our work immediately to the south on Portion 1 of the same farm, archaeological material is likely to be extremely sparse in the granite mountains. We did not work on the fringes of the hills, but we would expect archaeological resources to perhaps be somewhat richer in those areas as was demonstrated elsewhere. It is recommended that the areas to be prospected should be subjected to a field study. It is noted that in one mountainous area a dam is present and several nearby valleys appear greener than elsewhere. This may point to a spring being present and archaeological

resources in such an area would certainly be far richer than in the general surrounds. Depending on the outcome of the survey, an upgrade to a mining right would certainly require an impact assessment.



Figure 36: Photograph of one of the current bulk sampling areas on Lower Zwartmodder 79/1 showing in the foreground the ancillary activities and infrastructure that have been constructed around the sampling area.

8.3. Lower Zwart Modder 79/1: mining right application

The areas indicated to us on site were examined and it was found that very few archaeological resources were present within the mountainous terrain. It is recommended that a mine plan indicating areas to be disturbed, whether by mining, roads or construction, be provided for comment by an archaeologist. It seems likely than no further studies would be required for the areas already examined by us, but other areas may still be deemed sensitive.

8.4. Nous West 76: four 1.5 ha mining permit applications

This area was studied in parts, with the north being covered in greatest detail. The northern part of this area contained the most archaeological resources. Some have already been negatively impacted by current mining activities. It is imperative that the sites identified as significant (see Figure 35) be protected from further harm and, should this not be guaranteed, then mitigation (excavation, sampling and dating as required) should be carried out. It is recommended that an impact assessment be carried out for the proposed mining right application and it seems likely, given the peripheral damage that has already resulted, that archaeological mitigation of the identified sites will be required.

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