

HERITAGE IMPACT ASSESSMENT: PROPOSED PROSPECTING IN AN AREA NORTHEAST OF CONCORDIA, NAMAKWALAND MAGISTERIAL DISTRICT, NORTHERN CAPE

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)

Report for:

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On behalf of:

Northern Cape Base Metals (Pty) Ltd



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SUMMARY

ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to assess the potential impacts to heritage resources that might occur through proposed prospecting activities in an area measuring 37 577.59 ha to the northeast of Concordia, Northern Cape. The study area is centred on S29° 17' 12" E18° 13' 27". It is proposed to prospect for a wide variety of minerals and metals.

The area is generally comprised of flat, sandy plains with variably-sized igneous inselbergs protruding. No field survey was conducted because the drilling locations have yet to be determined. Potential impacts were determined from the desktop through studying other reports, aerial photography and historical maps as well as from the author's accumulated knowledge of northern Bushmanland.

It was found that archaeological and other heritage resources are likely to be very sparsely distributed on the landscape and that impacts to such sites are highly unlikely to occur because of the very small footprint of the proposed drilling. However, the final locations of drill holes are not known and thus impacts cannot be ruled out completely.

It is recommended that the proposed prospecting be authorised, but subject to the following recommendations which should be included as conditions of authorisation:

Phase 1:

- No sampling should be located in close proximity to water sources;
- No sampling or drilling sites should be located in close proximity to the bases of hills;
- If any suspicious features are located then these should be reported to an archaeologist to determine whether they need to be avoided. If they must be avoided, then an appropriate buffer will be determined at the time; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Phase 2:

- An archaeologist must be appointed to survey the proposed drill locations and their access routes once these are known.

Glossary

Acheulean: An archaeological name for the period comprising the later part of the Early Stone Age. This period started about 1.7-1.5 million years ago and ended about 250-200 thousand years ago.

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency.

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Handaxe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry. It is also referred to as a large cutting tool.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

DMRE: Department of Mineral Resources and Energy

ECO: Environmental Control Officer

EMPr: Environmental Management Program

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

NBKB: Ngwao-Boswa Ya Kapa Bokoni

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

REDZ: Renewable Energy Development Zone

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by N.J. van Zyl to conduct an assessment of the potential impacts to heritage resources that might occur through proposed prospecting activities in an area measuring 37 577.59 ha to the northeast of Concordia, Northern Cape (Figures 1 & 2). The study area is centred on S29° 17' 12" E18° 13' 27" and falls across four 1:50 000 mapsheets: 2918AA, 2918AB, 2918AC and 2918AD. It is proposed to prospect for a wide variety of minerals and metals.

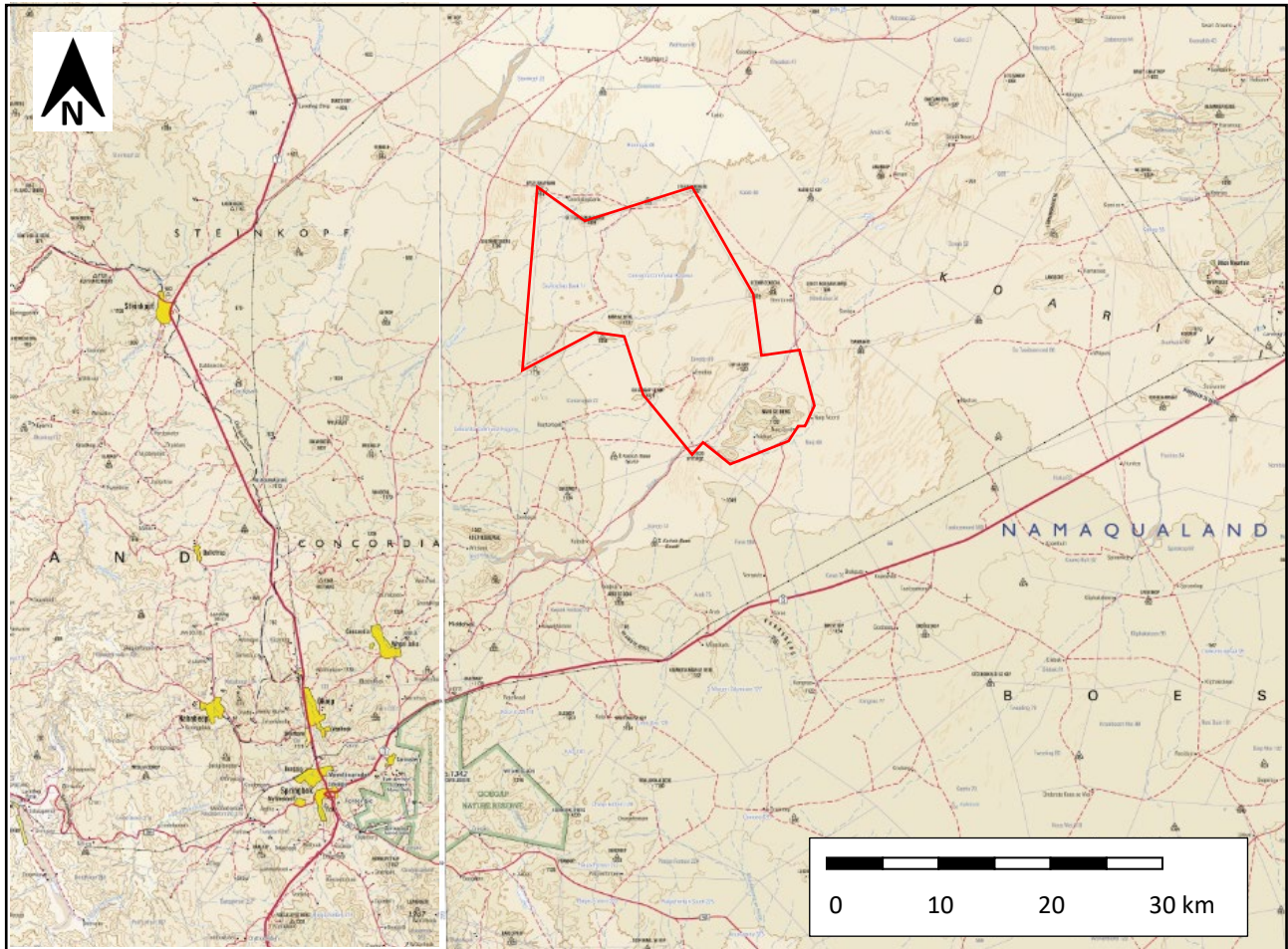


Figure 1: Extract from 1:250 000 topographic maps 2916 & 2918 showing the location of the site (red polygon). Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.

The prospecting would occur on the following eight properties:

- Portion of Plot 2100 Concordia;
- Remainder Farm Gezelschap Bank 71;
- Portion 2 Farm Gezelschap Bank 71;
- Remainder Farm Eendop 69;
- Portion 1 Farm Eendop 69;
- Portion of Remainder Farm Naip 68;
- Portion of Portion 2 Farm Naip 68; and
- Portion of Portion 4 Farm Naip 68.

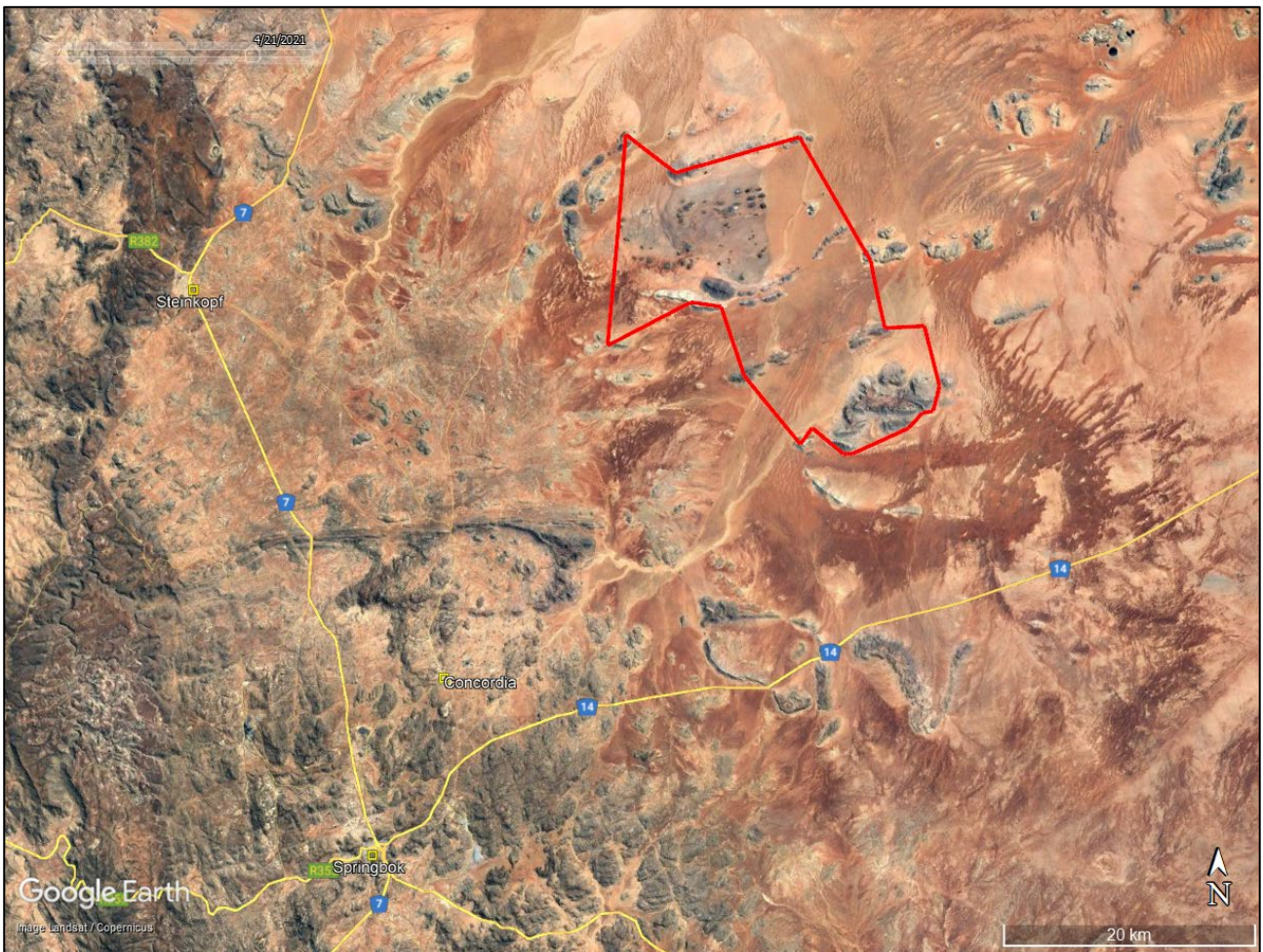


Figure 2: Aerial view of the study area (red polygon) showing the landscape around the site and its relationship to the N7 and N14 roads and the towns of Springbok, Concordia and Steinkopf.

1.1. The proposed project

1.1.1. Project description

The proposed prospecting will be carried out over a five year period as follows:

<u>Phase</u>	<u>Activity</u>	<u>Duration</u>
Phase 1	Investigations & surface surveys	2 years
Phase 2	Drilling* and assay	2 years
Phase 3	Compilation & reporting	1 year

Phase 1 will include aerial surveys, geological mapping and small sampling, and geophysical and radiometric surveys. The methodology followed for the latter two surveys would be determined following the initial aerial work. The results will then be compiled and only after analysis of the data can a drilling program and layout plan be devised. The prospecting will include taking small samples of less than 1 m³, reverse circulation drilling, core drilling and metallurgical sampling. Finally, all data would be collated to determine the feasibility of mining.

It is expected that Phase 1 would result in almost zero damage to the environment but Phase 2 could cause minimal impacts related to the drill rig accessing and working on site.

1.1.2. Identification of alternatives

No alternative study areas are under consideration since this site has been identified as potentially holding the desired minerals and is available for prospecting. The methods will be the most appropriate to the site and partly determined during the prospecting process and thus no alternative technology can be explored. Therefore, the only alternative under consideration is the no-go option.

1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant, since excavations may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA Consulting was asked to provide a heritage impact assessment (HIA) that would assess all relevant aspects of heritage and meet the requirements of the heritage authorities. Since the drilling locations will not be known until later in the process, the HIA was to be conducted as a desktop study.

1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the National Department of Mineral Resources and Energy (DMRE) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. LEGISLATIVE CONTEXT

2.1. National Heritage Resources Act (NHRA) No. 25 of 1999

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

- a) its importance in the community, or pattern of South Africa’s history;
- b) its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- c) its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- d) its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;

- e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- i) sites of significance relating to the history of slavery in South Africa.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

2.2. Approvals and permits

2.2.1. Assessment Phase

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BA. The present report provides the heritage component. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA; for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the DMR.

2.2.2. Construction Phase

If archaeological or palaeontological mitigation is required prior to construction, then the appointed archaeologist or palaeontologist would need to obtain a permit from SAHRA. This would be issued in their name. This is so that the heritage authority can ensure that the appointed practitioner has proposed an appropriate methodology that will result in the mitigation being done properly. A built environment permit, if required, would need to be obtained from the PHRA.

2.3. Guidelines

SAHRA have issued minimum standards documents for archaeological and palaeontological specialist studies. There is also a Western Cape Provincial guideline for heritage specialists working in an EIA context and which is generally useful. The reporting has been prepared in accordance with these guidelines. The relevant documents are as follows:

- SAHRA. 2007. Minimum Standards: archaeological and palaeontological components of impact assessment reports. Document produced by the South African Heritage Resources Agency, May 2007.
- Winter, S. & Baumann, N. 2005. Guideline for involving heritage specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 E. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1 with relevant dates of each source referenced in the text as needed. The data quality is suitable for the purpose of informing this desktop report.

Table 1: Information sources used in this assessment.

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

3.2. Field survey

No fieldwork was undertaken, but aerial imagery was searched for signs of heritage resources that might be present.

3.3. Specialist studies

Due to the occurrence of some areas of moderate palaeontological sensitivity, a desktop palaeontological assessment was compiled by Prof, Marion Bamford. The palaeontological report is submitted separately along with this HIA.

3.4. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system¹ for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

3.5. Consultation

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP.

3.6. Assumptions and limitations

Because the study was carried out from the desktop, it was assumed that the expected distribution of heritage resources in the wider region as determined from past experience will hold true throughout the study area.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site is in a very remote location used primarily for livestock grazing. It is well away from the N7 (28.8 km) and N14 (13.5 km) with only sand/gravel roads present in and around the site. Anthropogenic features are rare and limited largely to occasional structures and a few stock posts. Limited evidence of past small-scale mining or prospecting was also seen on aerial photography.

4.2. Site description

The site is composed of a wide, flat, sandy plain with many small rocky hills and mountains protruding from it (Figures 3 & 4). Vegetation cover is sparse on the sandy plains with much sand visible between tufts of grass (Figures 5 to 8). The rocky slopes have somewhat more vegetation, especially on south-facing slope (Figure 9).

¹ The system is intended for use on archaeological and palaeontological sites only.

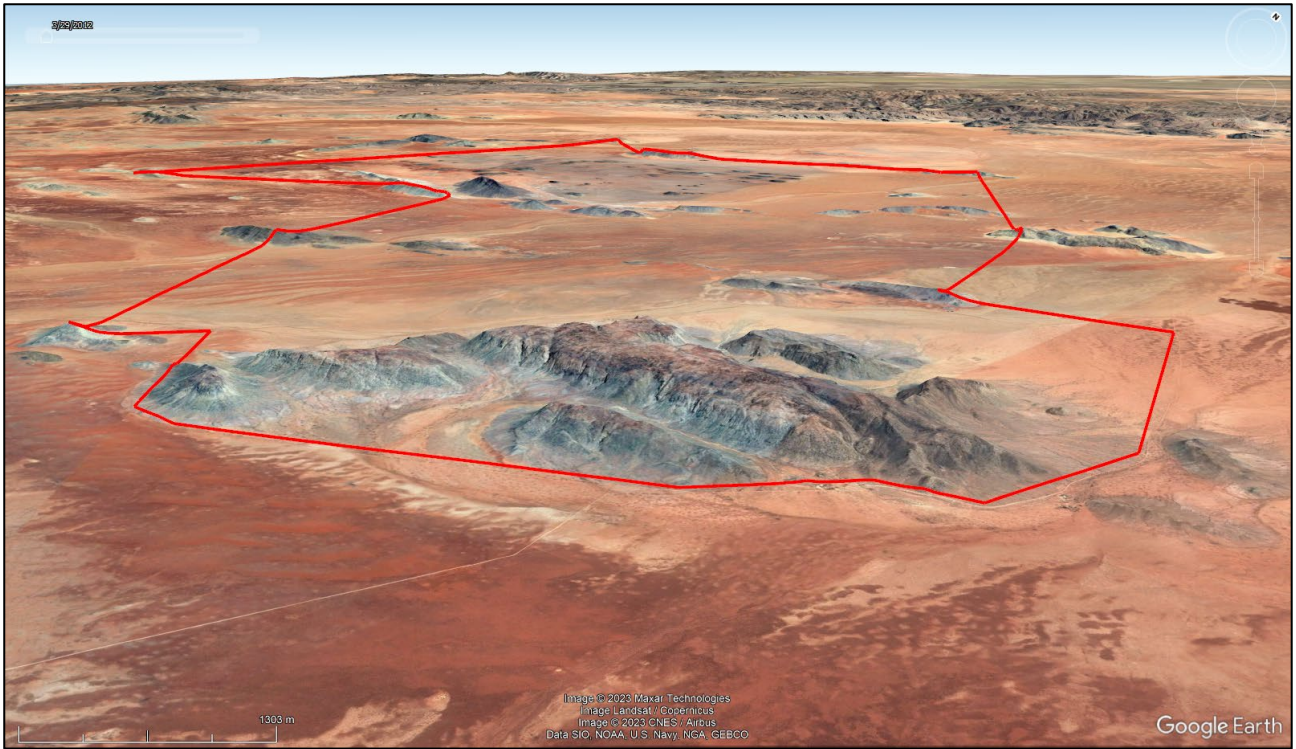


Figure 3: Google Earth simulated view towards the northwest showing the largest hill in the southern part of the study area.

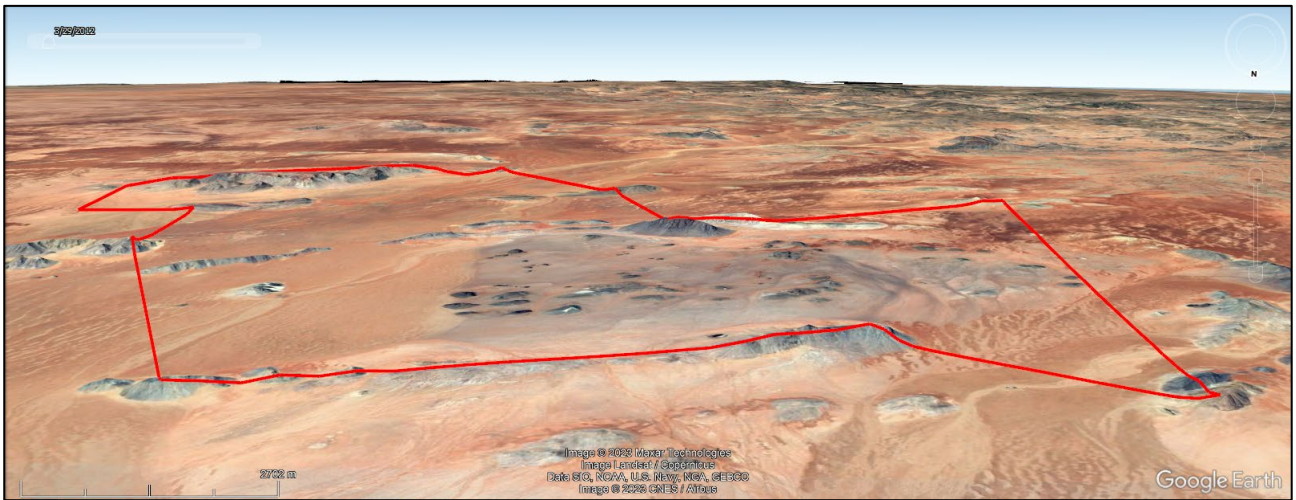


Figure 4: Google Earth simulated view towards the south showing the many smaller hills in the northern part of the study area.



Figure 5: View of the plains on site. Source: N.J. van Zyl.



Figure 6: View of the plains on site. Source: N.J. van Zyl.



Figure 7: View of the plains on site. Source: N.J. van Zyl.

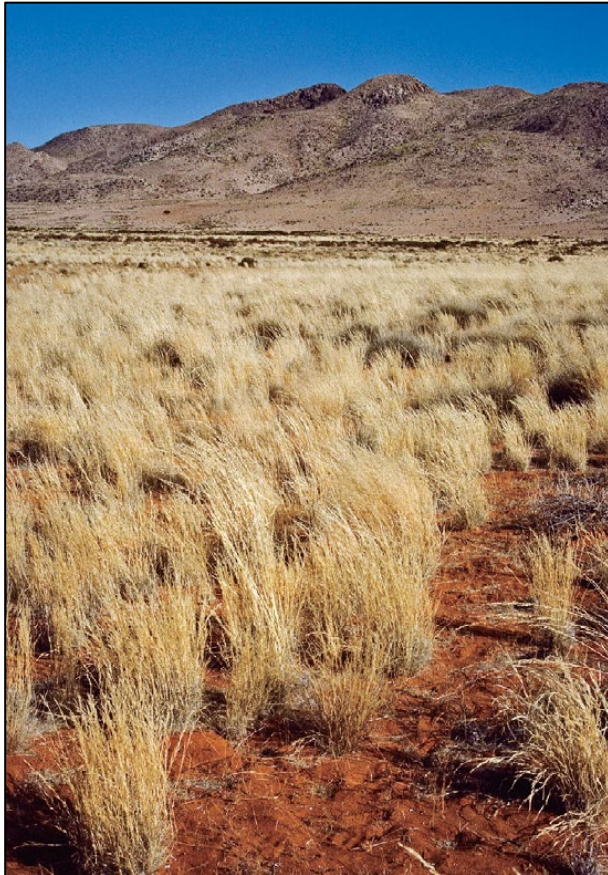


Figure 8: View of the plains on site. Source: N.J. van Zyl.



Figure 9: View of a rocky slope (Naip se Berg) on site. Source: N.J. van Zyl.

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project.

5.1. Palaeontology

The SAHRIS Palaeosensitivity Map shows the site to be of largely low to zero palaeontological sensitivity but a few small areas of moderate sensitivity are present along some of the drainage lines of the area (Figure 10). A separate specialist assessment was thus compiled to determine the potential significance of impacts to fossils in these areas.

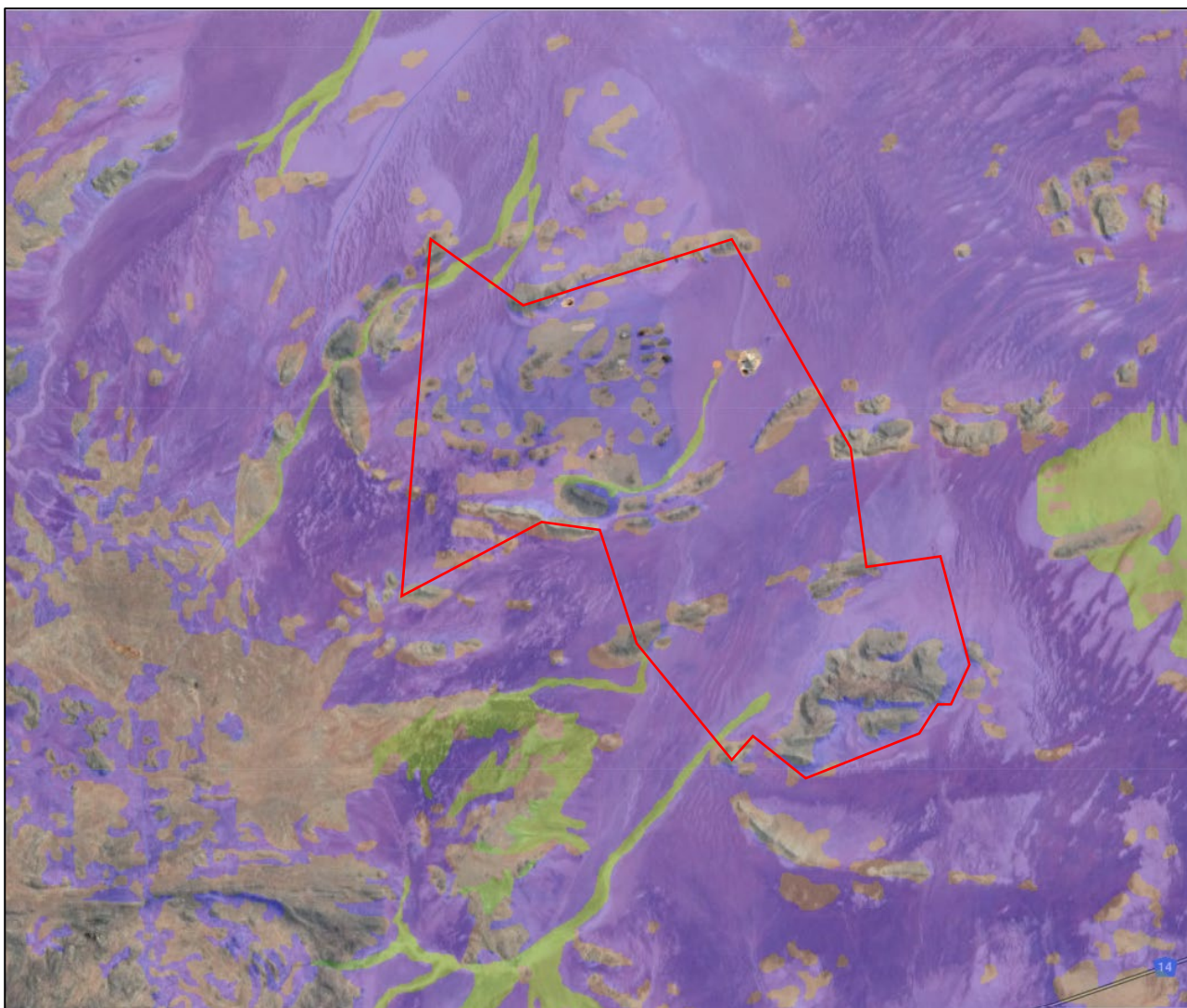


Figure 10: Extract from the SAHRIS Palaeosensitivity Map showing the site to be of largely low sensitivity (blue shading) but with areas of zero (grey) and moderate (green) sensitivity.

5.2. Archaeology

The Bushmanland area frequently reveals background scatter (Beaumont *et al.* 1995) artefacts in varying density with most of it likely attributable to the Middle Stone Age (MSA). Early Stone Age (ESA) finds tend to be rare in the general area (very rare Acheulean handaxes are sometimes

located), while LSA sites are more commonly found and better preserved. Historical sites are almost exclusively connected with farming which means that such sites are often associated with farmsteads.

Available information from the immediate area is very sparse because, although a number of cases have been registered on SAHRIS, the majority are prospecting applications which have had no heritage assessments conducted, either because the applications were never finalised or else because they were approved without further study being requested. No assessments have taken place within the present study area. Nonetheless, examination of reports from the wider region and the field experience of the author assists with a determination of the types of heritage resources expected to occur.

Most of the study area is expected to be sterile of anthropogenic features. This is supported by Van Rhyneveld's (2017) field survey to the east of the present study area. The vast majority of locations checked were found to be free of heritage with just a few light stone artefact scatters of very low significance being found in places. It is important to note that her survey was not a spatial survey but rather focused on drill locations. This is consistent with the present author's observations in the wider area, both on the plains to the east (Orton 2015, 2016a, 2016b, 2016c, 2016d, 2019a, 2019b, 2019c, 2019d, 2019e, 2019f, 2021b) and those to the west, closer to the granite of the Kamiesberg (Orton 2019g, 2021a; Orton & Webley 2012).

However, there are certain places where archaeological traces are more commonly found. Most sites are found either along the margins of rocky hills or in locations associated with water. A number of the reports cited above include finds in such locations, as does Morris (2013, 2017). Because of this, an aerial survey was done using Google Earth. This did reveal several sites and locations where archaeological materials are more likely to be found (Figure 11). A number more were located from historical maps and survey diagrams and are included in Figure 11. Figures 12 to 15 show a few examples of such places.

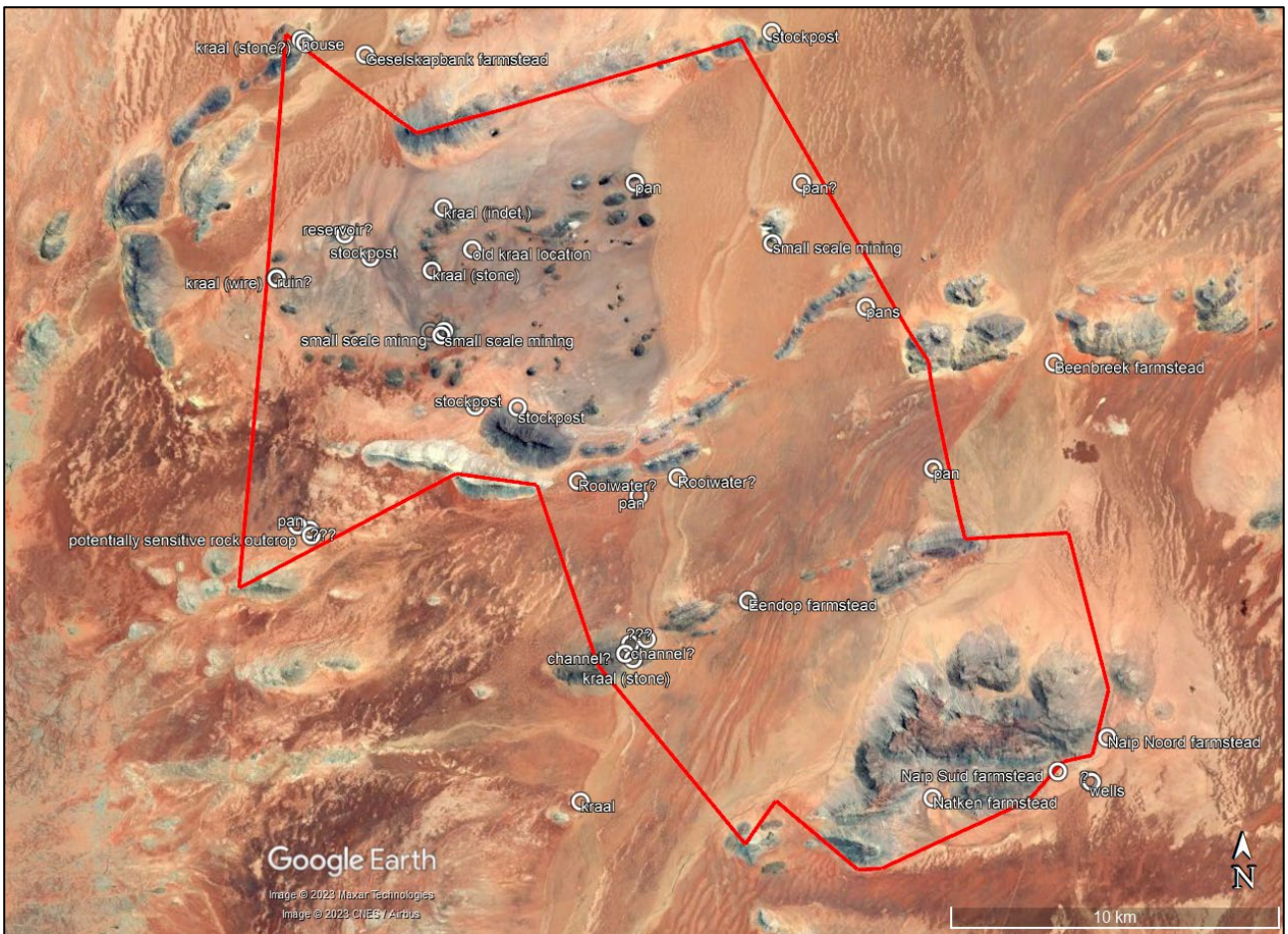


Figure 11: Aerial view of the study area showing all locations considered possibly sensitive from a heritage point of view.



Figure 12: Aerial view of a kraal that is almost certainly made from stones and thus almost certain to be a heritage resource. It is a typical location on the lowermost part of a rocky hill.

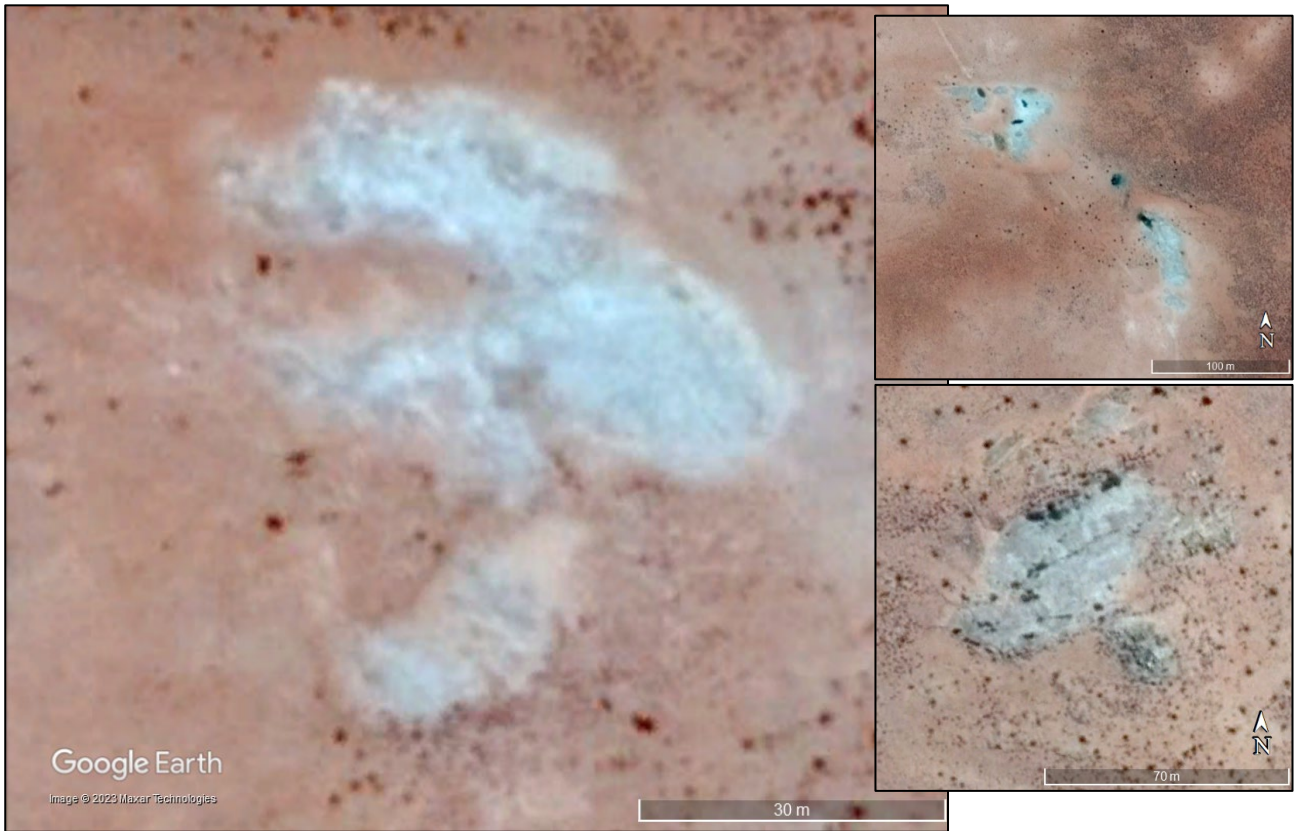


Figure 13: Aerial view of what looks like the kind of bedrock outcrop commonly associated with water and LSA scatters and lying in the western part of the study area. The upper inset shows a view of Horienas se Vlei located some 16 km east of the study area. The dark patches of accumulated water can be clearly seen. The lower inset is Beeste Vlei in the western part of the study area.



Figure 14: Aerial view of a pan that might have archaeological materials alongside it.



Figure 15: Aerial view of the Eendop farmstead showing various features including what seems to be stone-walled kraals in the far north of this image.

Far less likely to occur is rock art. Examples do occur in the wider landscape on granite inselbergs and in the Kamiesberg but are very rare (Orton 2013). The majority consist of finger-painted geometric imagery associated with the Khoekhoen. The landscape on site is not conducive to the finding of rock art as the gneiss hills in this area do not produce the right kinds of vertical or overhanging rock walls where paintings are typically found and dolerite, which was favoured for engraving, does not occur in the study area.

5.3. Graves

Graves may be found close to farmsteads in which case they are generally fenced family or labourers' graveyards. Such sites are easily visible and not in danger of harm. At more risk, however, are unmarked or minimally marked precolonial or colonial graves that could be located almost anywhere that the substrate is soft enough to excavate by hand. Colonial graves may be marked with a single upright stone while pre-colonial graves are often unmarked. In some cases, however, precolonial graves can be marked with stone cairns with these likely being from the historical contact period (e.g. Johnson 2019; Orton 2019f, 2019g).

5.4. Historical aspects and the Built environment

Permanent historical occupation of this arid landscape is relatively recent with most farms dating to the final 19th or early 20th century. Built structures are invariably of 20th century age and generally low cultural significance. An exception occurs on the farm Haramoep to the east of the study area where there are structures of high cultural significance present, although they do still date to the early 20th century (Van Rhyneveld 2017). Included in this complex is an intact (but no longer used) indoor horse mill, a feature that is extremely rare (Orton, personal observation 2016). The farm was first granted in 1914 suggesting all permanent structures to post-date that year.

Figure 16 shows a general plan of farms in the area. It was constructed from survey data gathered in 1893 and 1894 and indicates a number of places that are not always readily evident on aerial photography and that have been incorporated into Figure 11. Of those in the study area, Naab 70 was transferred to private ownership in 1908, Eendop 69 in 1910 and Gezelschap Bank in 1910. Farm Naip 68 was resurveyed in 1927 and transferred in 1942 to the Government. Permanent structures on these farms are thus likely to all date within the 20th century. Prior to this, the area would have been used by trekboers who, like the Nama herders before them, would have moved between water sources living in temporary dwellings and/or ox wagons. Figure 17 shows a historical British map from 1907. This identifies further places on the landscape that might be sensitive. It indicates a number of tracks through the area, but relatively few other features. Importantly, though, it indicates good water sources around Naip se Berg in the south.

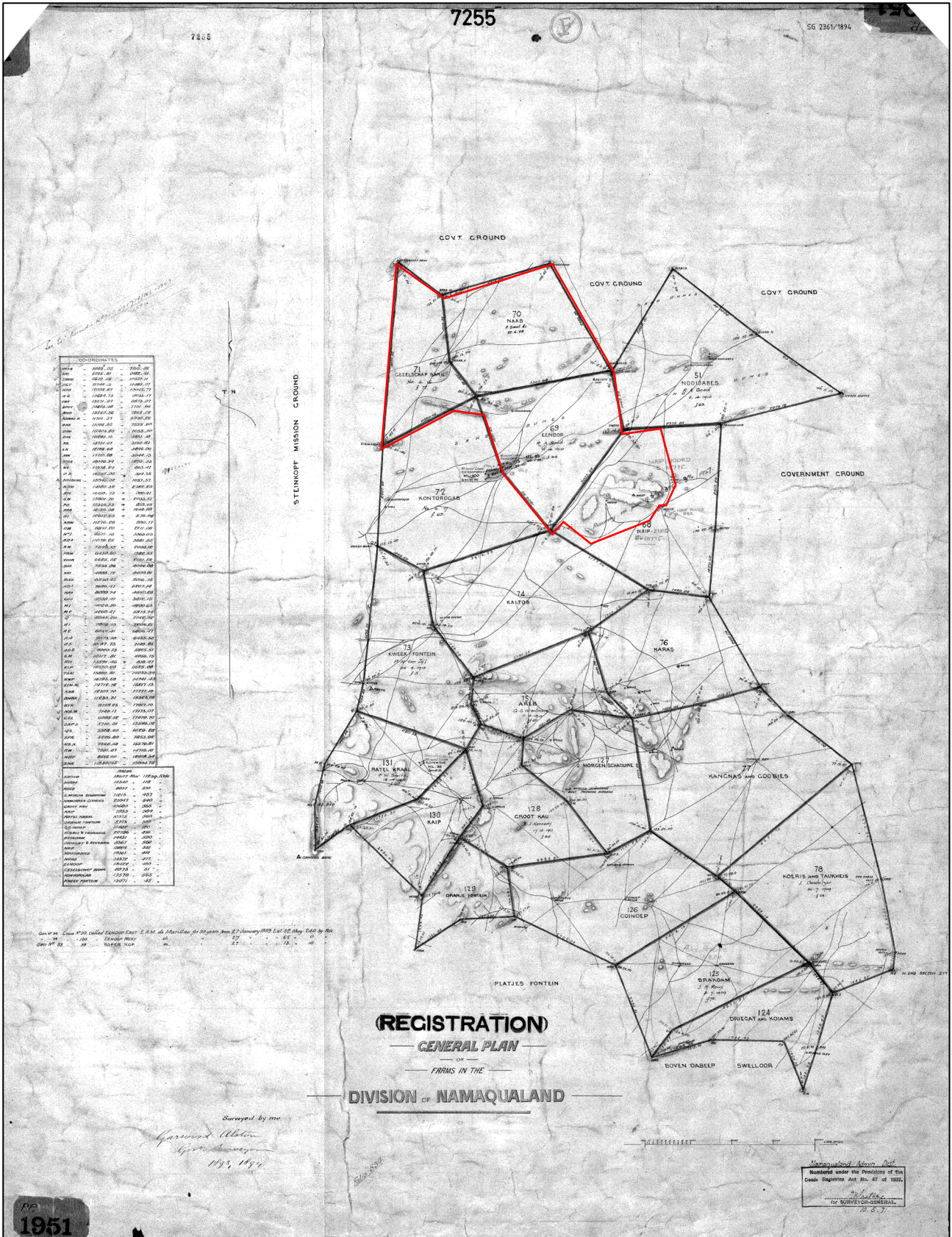


Figure 16: General plan of farms surveyed in 1893 and 1894 in the Division of Namaqualand. The study area farms are highlighted. Source: Chief Surveyor General (<http://csg.drdr.gov.za/esio/listdocument.jsp>).

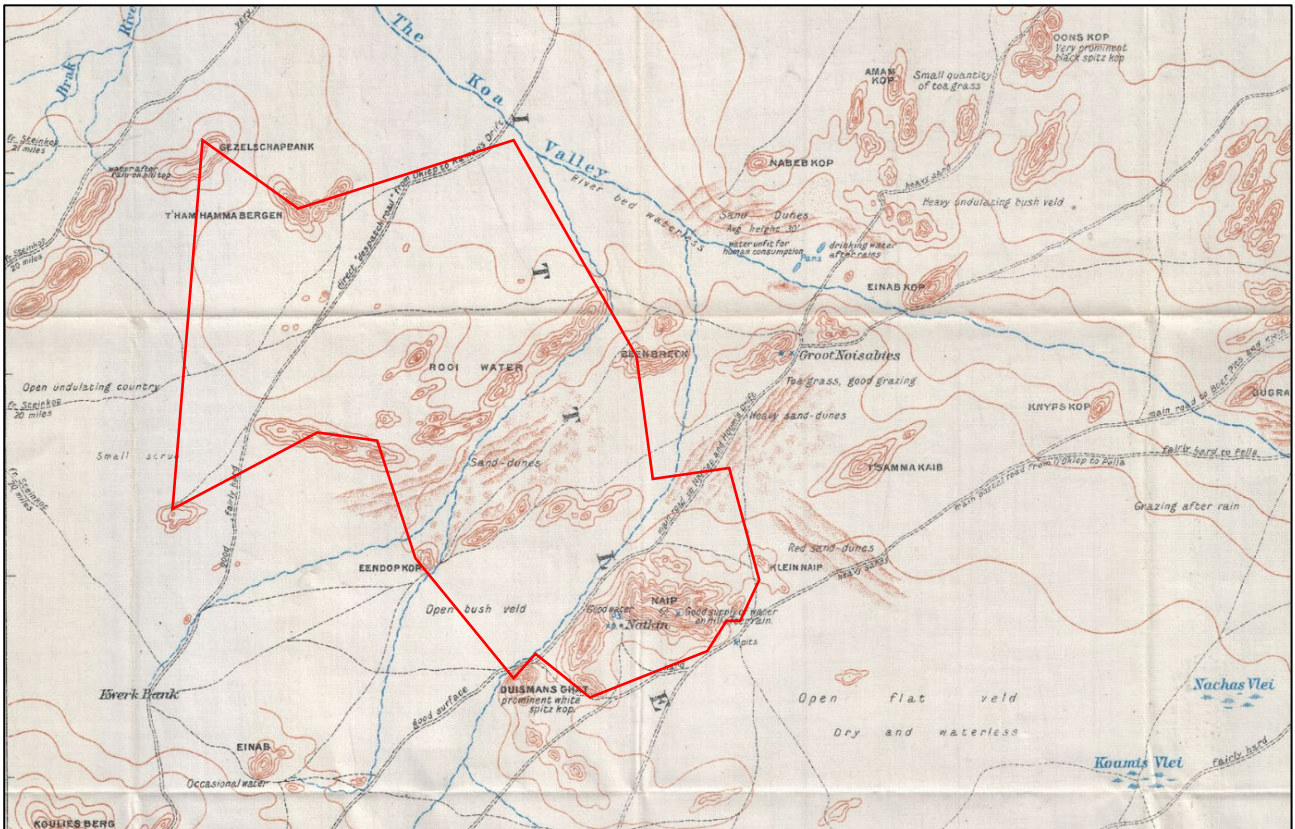


Figure 17: Extract from the “Cape Colony Reconnaissance Series: Little Bushmanland” map of 1907.

5.5. Cultural landscapes and scenic routes

Cultural landscapes are the product of the interactions between humans and nature in a particular area. Sauer (1925) defined them thus: “The cultural landscape is fashioned from a natural landscape by a cultural group. Culture is the agent, the natural area is the medium, the cultural landscape the result”.

The landscape of the study area is largely natural with aesthetic significance but many anthropogenic features occur, albeit with a relatively light footprint. These are focused around the farmsteads and outlying stock posts. While there is an ephemeral archaeological cultural landscape present, this colonial period landscape related to livestock grazing is the dominant cultural landscape of the area.

The site is too far from the N7 and N14 roads (both regarded as scenic routes) for those to be affected. Roads within and close to the study area are all local gravel/sand access roads.

5.6. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above). Because no site visit has been conducted, this section estimates the likely significances and grades (the latter for archaeology and graves only) that might occur in the study area based on the desktop review. No confirmed heritage resources are known in the study area and hence no mapping is provided.

It is expected that archaeological resources of up to medium local significance (potential grade IIIB) might be present, although resources of such grade would be rare. The majority are likely to be of lower significance and graded in the GPA to GPC range.

Graves are deemed to have high cultural significance at the local level for their social value. They would be allocated a grade of IIIA.

Built heritage is likely to all be of low cultural significance for architectural, historical and social values.

The cultural landscape is largely a natural landscape with aesthetic value and is rated as having medium cultural significance at the local level.

6. ASSESSMENT OF IMPACTS

Due to the nature of the proposed prospecting, no impacts to the cultural landscape are anticipated. Buildings would always be avoided and hence none will be impacted. The impacts identified for this project are thus:

- *Construction phase:*
 - Impacts to palaeontology
 - Impacts to archaeology
 - Impacts to graves

All impacts would occur at the start of the on-site physical prospecting (i.e. setting up of the sampling and/or drilling equipment) so there will not be impacts during the operation (actual sampling/drilling) and decommissioning (rehabilitation of drill sites) phases.

While palaeontological heritage is assessed in the separate specialist study, all other impacts are considered here.

6.1. Construction Phase

6.1.1. Impacts to archaeological resources and graves

Direct impacts to archaeological resources and/or graves would occur during the construction phase when equipment is brought to the site and the prospecting locations are prepared for work. Because no specific archaeological sites or graves are known, this assessment works on the premise that their distribution would be very low density with impacts highly unlikely to occur. The intensity is thus rated based on the overall study area and is likely to be low. The significance is rated as **low negative** (Table 2). For Phase 1, and because no specific sites or graves are known, mitigation entails avoiding sensitive landscape features where archaeological sites (and in some cases graves) are most likely to occur and avoiding any suspicious piles of stones or single stones planted unnaturally in the ground. These include water holes, pans, watercourses and the lowermost slopes and areas around the rocky hills. Once the drilling locations for Phase 2 are known then an archaeological survey of these locations and their access routes must be carried out. With mitigation the impact would still be **low negative**. The locations of graves can be impossible to predict and, unless surface markers are visible, little can be done to avoid them.

There are no fatal flaws in terms of construction phase impacts to archaeology and graves.

Table 2: Assessment of construction phase archaeological impacts.

Potential impacts on archaeological resources	
Nature and status of impact:	Direct, Negative
Extent and duration of impact:	Local, Permanent
Intensity	Low
Probability of occurrence:	Improbable
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Small sampling to avoid potentially sensitive locations on the landscape. An archaeologist to conduct a survey of drill locations and access routes once these are known.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.2. Cumulative impacts

Because of the very low density of significant heritage resources in this arid landscape and the expected low significance of impacts, no significant cumulative impacts are expected to occur as a result of the proposed prospecting.

6.3. Evaluation of impacts relative to sustainable social and economic benefits

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The proposed prospecting would not result in any socio-economic benefits at this stage but should viable mineral resources be discovered and a mining operation be opened in the future then the local communities would certainly benefit from jobs and a general increase in economic activity. These are clear economic and social benefits and, if mitigation is applied as suggested above, then the socio-economic benefits outweigh the residual impacts.

6.4. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect archaeological materials. Trampling from grazing animals and/or farm/other vehicles could also occur. These impacts would be of **negligible negative** significance.

6.5. The No-Go alternative

If the project were not implemented then the site would stay as it currently is (impact significance of **neutral**). Although the heritage impacts with implementation would be greater than the existing impacts, the loss of socio-economic benefits is more significant and suggests that the No-Go option is less desirable in heritage terms.

6.6. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are not envisaged.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The actions recorded in Table 3 should be included in the environmental management programme (EMPr) for the project.

Table 3: Heritage considerations for inclusion in the EMPr.

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Impacts to archaeology and graves					
Damage or destruction of archaeological sites or graves	Avoid impacts	Examine each prospecting location to locate any potentially sensitive features. Shift operation to avoid features.	Site foreman or other responsible individual to be tasked with ensuring compliance.	Every time a new prospecting location is set up.	Project developer or environmental control officer (ECO)

8. CONCLUSIONS

This assessment finds that archaeological and other heritage resources are likely to be very sparsely distributed through the study area and focused on farmsteads, water sources and hills. Most sites are likely to be ephemeral stone artefacts scatter of very low cultural significance. In general, impacts are highly unlikely to occur.

8.1. Reasoned opinion of the specialist

Because of the expected very low density of archaeological sites and the likelihood that sensitive features would be avoided for other reasons (e.g. freshwater impacts), it is not expected that any significant impacts to heritage resources would occur, so long as potentially sensitive locations are avoided. It is thus the opinion of the heritage specialist that the proposed prospecting should be authorised in full.

9. RECOMMENDATIONS

It is recommended that the proposed prospecting be authorised, but subject to the following recommendations which should be included as conditions of authorisation:

Phase 1:

- No sampling should be located in close proximity to water sources;
- No sampling or drilling sites should be located in close proximity to the bases of hills;
- If any suspicious features are located then these should be reported to an archaeologist to determine whether they need to be avoided. If they must be avoided, then an appropriate buffer will be determined at the time; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be

reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Phase 2:

- An archaeologist must be appointed to survey the proposed rill locations and their access routes once these are known.

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APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 23 Dover Road, Muizenberg, 7945
Telephone: (021) 788 1025
Cell Phone: 083 272 3225
Email: jayson@asha-consulting.co.za

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science) 1997	
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233

CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
Stone Age archaeology (awarded 2007)
Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

➤ **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 – 2017
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

Fieldwork and project experience:

Extensive fieldwork and experience as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- Project types
 - Notification of Intent to Develop applications (for Heritage Western Cape)
 - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
 - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
 - Archaeological specialist studies
 - Phase 1 archaeological test excavations in historical and prehistoric sites
 - Archaeological research projects
- Development types
 - Mining and borrow pits
 - Roads (new and upgrades)
 - Residential, commercial and industrial development
 - Dams and pipe lines
 - Power lines and substations
 - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
 - Duinefontein, Gouda, Namaqualand
- MSA rock shelters
 - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
 - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
 - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
 - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
 - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
 - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
 - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
 - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

Awards:

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

APPENDIX 2 – Site Sensitivity Verification

As required in Part A of the Government Gazette 43110, GN 320, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool. The details of the site sensitivity verification are noted below:

Date of Site Visit	
Specialist Name	Dr Jayson Orton
Professional Registration Number	ASAPA: 233; APHP: 043
Specialist Affiliation / Company	ASHA Consulting (Pty) Ltd

Method of the Site Sensitivity Verification

Provide a description on how the site sensitivity verification was undertaken using the following means:

- (a) desk top analysis, using satellite imagery;*
- (b) preliminary on -site inspection; and*
- (c) any other available and relevant information.*

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape. This was used to provide sensitivity data. Subsequent fieldwork served to ground truth the site, including areas identified as potentially sensitive. Desktop research was also used to inform on the heritage context of the area. This information is presented in the report (Sections 5.2.1 and 5.4.1).

Outcome

Provide a description of the outcome of the site sensitivity verification in order to:

- (a) confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and*
- (b) include a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.*

The map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low throughout the study area.

Sites of Grade IIIA (high cultural significance), IIIB (high cultural significance) and GPA (medium cultural significance) should be regarded as of high sensitivity. GPB sites (low cultural significance) can be seen as medium, while GPC (very low significance) are low sensitivity.

Sites of Grade IIIA (high cultural significance) and IIIB (medium cultural significance) should be regarded as of high sensitivity. IIIC sites (low cultural significance) can be seen as medium, while NCW (very low significance) are low sensitivity.

Map of relative Archaeological and Cultural and Heritage theme sensitivity

