

**HERITAGE IMPACT ASSESSMENT:
PROPOSED QUARTZ MINE ON KABIS 27/REM,
NAMAKWALAND MAGISTERIAL DISTRICT,
NORTHERN CAPE**

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)
as part of a Heritage Impact Assessment.

SAHRA Case No.: TBC

Report for:

N.J. van Zyl

P.O. Box 255, Springbok, 8240
Email: klaaskraalbos@gmail.com

On behalf of:

Golden Tropic Mining (Pty) Ltd



Dr Jayson Orton

ASHA Consulting (Pty) Ltd

40 Brassie Street, Lakeside, 7945
Tel: (021) 788 1025 | 083 272 3225
Email: jayson@asha-consulting.co.za

20 February 2021

SUMMARY

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 the proposed mining of rose quartz from an outcrop situated on the farm Kabis 27/rem, in northern Bushmanland, approximately 33 km southeast of the village of Goodhouse and 37 km northwest of Aggeneys. The centre of the mine application area is at S39° 04' 30" E18° 30' 01" and it is located on an outlier of a hill known as Bantamberg. Mining has occurred on the site in the past.

The mining study area was found to be almost exclusively rocks with minimal vegetation. It is part of an inselberg which is strongly dominated by quartz. The surrounding plains are of red sand with fine gravel and vegetation cover is very light.

The survey revealed that Stone Age people had submitted the koppie and removed flakes from the quartz outcrop. A single crypto-crystalline silica flake on a pebble was found near the base of the koppie. No other archaeological materials were found and these finds are of very low cultural significance. Evidence of earlier mining occurs in the form of blast and tool marks on the outcrop, as well as some mid-20th century (or later) stone and cement foundations at the base of the koppie. A small overhang to the south of the koppie contained tins and glass and was likely an area where miners camped in the past. Due to the aridity and colour contrasts, the landscape has a strong character and has aesthetic significance. However, because of the extreme remoteness of the site and its invisibility from public roads, visual impacts to the landscape are of no concern.

Overall, heritage impacts will be minimal and there are no areas that require avoidance or mitigation. The project may proceed as planned.

It is recommended that the project be allowed to proceed but subject to the following recommendation:

- 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.

Glossary

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

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

SAHRA: South African Heritage Resources Agency

ASAPA: Association of Southern African Professional Archaeologists

SAHRIS: South African Heritage Resources Information System

CRM: Cultural Resources Management

DMR: Department of Mineral Resources

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

PPP: Public Participation Process

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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 the proposed mining of rose quartz from an outcrop situated on the farm Kabis 27/rem, in northern Bushmanland, approximately 33 km southeast of the village of Goodhouse and 37 km northwest of Aggeneys (Figures 1 to 3). The centre of the mine application area is at S39° 04' 30" E18° 30' 01" and it is located on an outlier of a hill known as Bantamberg.

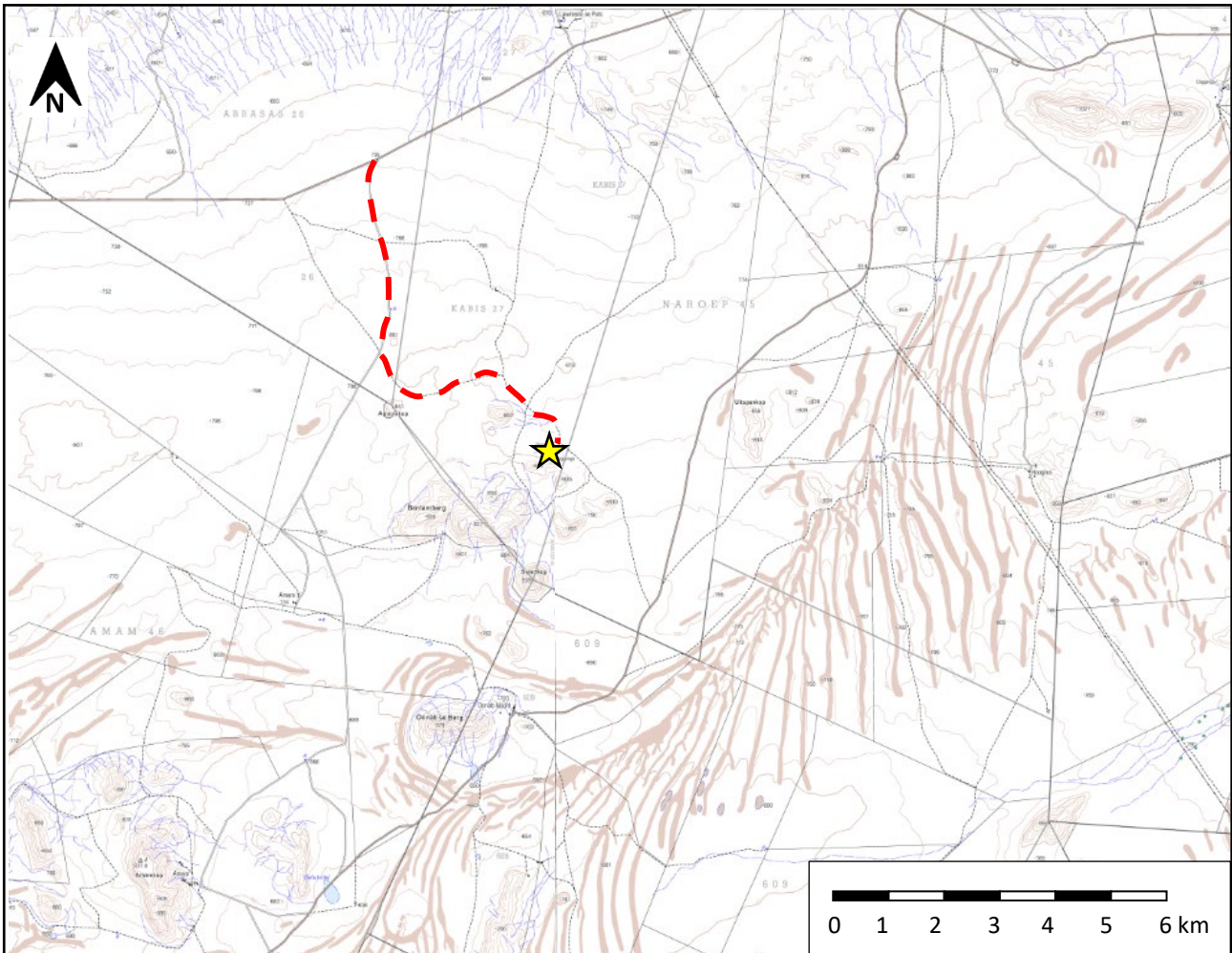


Figure 1: Extract from 1:50 000 topographic mapsheets 2918AB and 2918BA showing the location of the site. The red dashed line shows the existing track that will be used for access and the mine is at the yellow star. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.



Figure 2: Aerial view showing the location of the access track (red line) and mine application area (red polygon). Bantamberg is indicated.

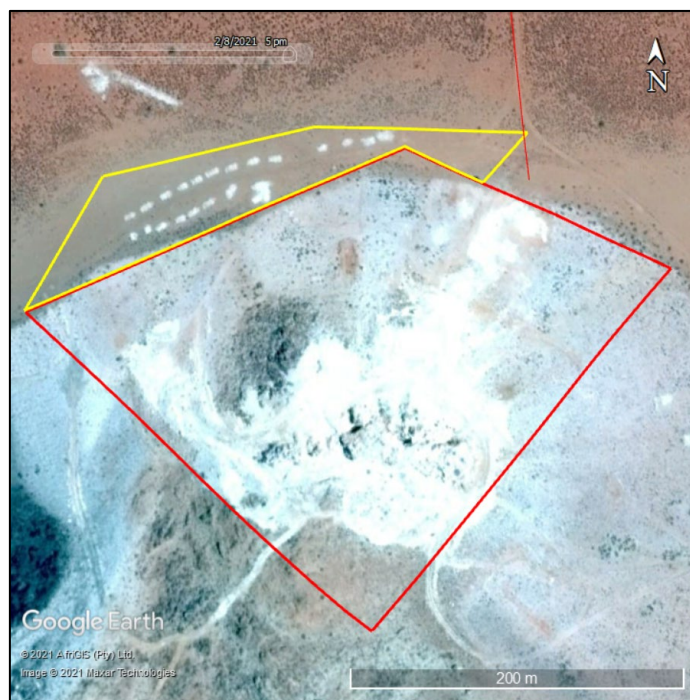


Figure 3: Aerial view showing the boundary of the 5 ha mine application area (red polygon) and associated laydown area yellow polygon). The evidence of earlier working is visible on and around the outcrop.

1.1. The proposed project

1.1.1. Project description

The applicant proposes to establish a small-scale Rose Quartz mining operation. The total development area will be approximately 5.0 hectares, and the mine will have a lifespan of 2 years. The ore body occurs in a ridge and the mining method adopted is the opencast one mining into the ridge employing surface drilling and blasting or breaking of the ore body with hydraulic peggers. As the ore body occurs in a ridge no excavation will be required as bench mining directly into the ridge was done previously. Mining will continue from the terraces left behind in the past.

A simple mining method will be employed entailing development of the outcrop in terraces from top to bottom. The broken rock will be pre-sorted and the host rock containing no ore (about 90%) is retained at the mine area to level the floor and to create working platforms around the outcrop. The quartz blocks will be moved to the stockpile area where they will be sized and sorted.

Approximately 0.5 ha will be required for a product stockpile area, while a further 0.5 ha will be used for all other ancillary activities including offices and storage (to be in shipping containers), ablution area, domestic and industrial waste area and generator area. This will be located to the north of the mine application area as shown in Figure 3.

As the mining method involves removal of the top of the koppie, no backfilling will be required. Excess rock will be placed around the koppie during mining and at closure the final landscape will be a flat topped koppie.

1.1.2. Identification of alternatives

No location alternatives have been identified since the mine is targeting the area where the desired mineral resource lies. No alternative methods are considered because the method most suited to the site and ore is the one preferred. No other activities are considered since the applicant is only interested in mining and is not the landowner. As such, only the preferred alternative (as outlined above) and the No-Go alternative will be considered here.

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 other 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 assess the potential heritage impacts that the project might have. The assessment was to include both desktop research and a site visit. The results of the work should be used to compile a Heritage Impact Assessment (HIA).

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 Department of Mineral Resources (DMR) 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

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

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.

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. Data were also collected via a field survey.

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 and 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

The site was subjected to a foot survey on 5th February 2021. This was during summer but, in this very dry area, the season makes no meaningful difference since vegetation cover is absent and hence the ground visibility for the archaeological survey is always excellent. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

3.3. Specialist studies

No other heritage specialist studies were commissioned for this project.

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

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of

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

archaeological material visible at the surface. The site was not surveyed in as much detail as might normally be the case. This is because of the generally steep and rocky nature of the site. Any potentially interesting areas were targeted (whether in or out of the 5 ha study area) with the remainder of the study area receiving only a broad-brush survey (Figure 4).

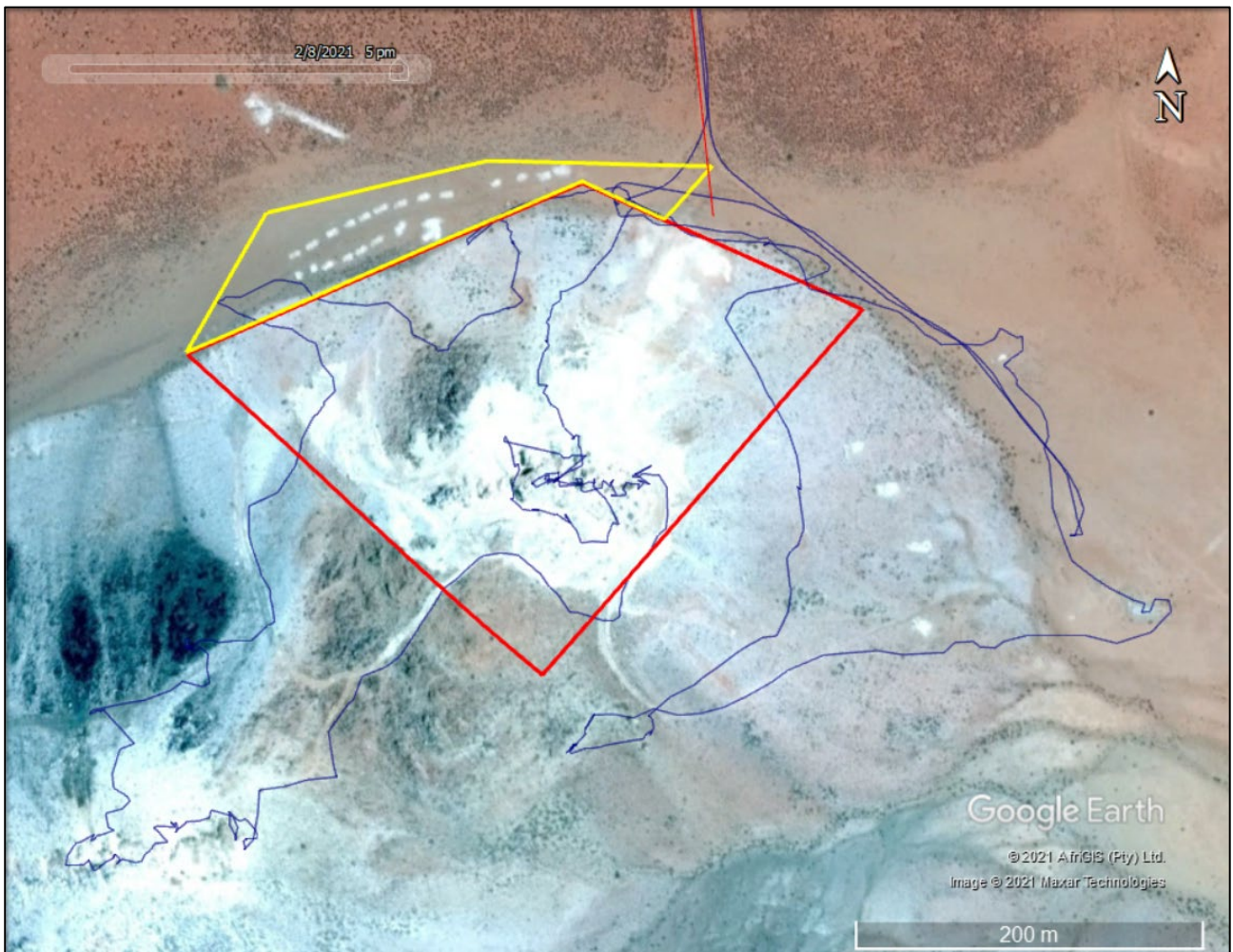


Figure 5: Aerial view of the study area showing the survey tracks (blue lines).

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The site lies in a very remote area that is generally used only for very low intensity livestock grazing. Access to the general area is via a gravel road that lies about 6.3 km north of the proposed mine area with only small sand/gravel tracks leading off it into the farms. Due to the aridity, farms are very large and buildings are virtually absent; none seen in the vicinity of the study area. Previous mining has occurred on the same site in the past.

4.2. Site description

The site is in a very arid context. Rock outcrops protrude from a sandy/gravelly plain and only scattered small bushes or grass tufts are present on the sandy plains (Figure 5) with even less vegetation on the rocky hills (Figures 6 & 7). Figure 8 to 11 show views from the summit of the target koppie, while Figure 12 shows a view onto the koppie from an adjoining hill (which was also the subject of small scale mining in the past). Figures 13 to 19 give an idea of the existing mining



Figure 5: View towards the south showing the koppie proposed for mining (red bracket) in its local context.



Figure 6: View towards the south from the foot of the koppie showing the rocky nature of the study area and minimal vegetation cover.



Figure 7: View towards the west showing the tracks made by dragging quartz blocks down the hill.



Figure 8: View towards the north from the summit of the target koppie.



Figure 9: View towards the east from the summit of the target koppie.



Figure 10: View towards the south from the summit of the target koppie.



Figure 11: View towards the west from the summit of the target koppie.



Figure 12: View towards the northeast from an adjoining hill showing the koppie targeted for mining (right in the centre of the photograph).



Figure 13: Previously mined area on the southern side of the summit of the koppie.



Figure 14: Short tunnel into the mined koppie.



Figure 15: Tunnel entrance in the west side of the mined koppie.



Figure 16: View from within a tunnel in the mined koppie.



Figure 17: Dense clusters of mica that may have been targeted by earlier miners.



Figure 18: Fracture pattern (radiating from the centre of the photograph) showing that blasting was used in the old mine.



Figure 19: Tool marks showing hand working of softer rocks containing clusters of mica. Scale in cm.

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 study area is shown on the SAHRIS palaeontological sensitivity map as being of zero sensitivity (Figure 20). This is because it is a metamorphic rock outcrop. The sandy plains away from the outcrops and which are crossed by the access track are of low sensitivity (blue shading). Given that no changes will be made to the track, no palaeontological impacts are expected.

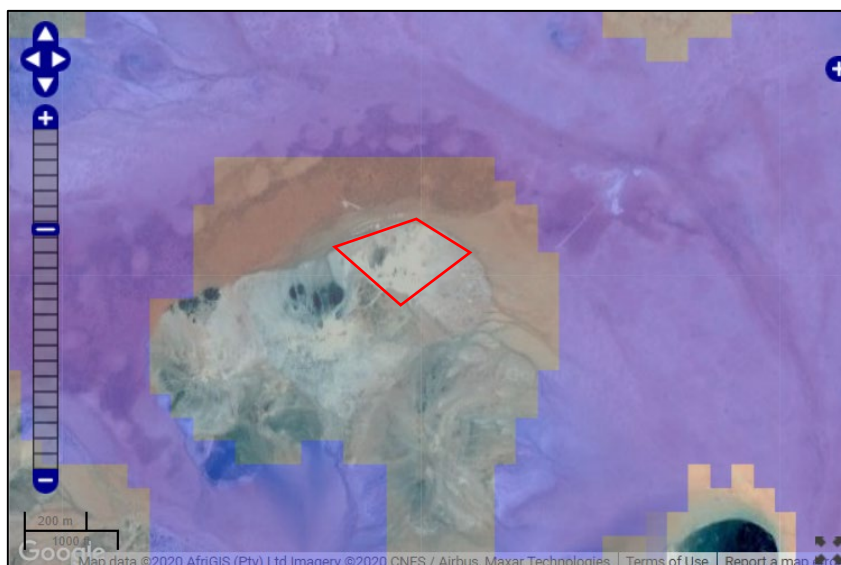


Figure 20: Extract from the SAHRIS Palaeosensitivity map showing the study area (red polygon) to be of zero palaeontological sensitivity (grey shading).

5.2. Archaeology

5.2.1. Desktop study

Because of the very dry nature of the landscape, archaeological sites tend to be sparsely distributed and are usually very closely associated with water sources. A prime example of this is the many small sites found scattered around a large pan 38 km south of the present study area (Orton 2016a). Morris (2013) found a similar occurrence close to Aggeneys, while a third occurs some 20 km southeast of the proposed mine (personal observation, 2016). The general lack of archaeological sites in other areas (e.g. Morris 2011a, 2011b; Orton 2019a, 2019b; Smith 2012; Van Ryneveld 2017) does not suggest a lack of occupation, but more likely suggests that people were moving through these areas more quickly and simply did not leave many traces of their passing. It is well-known that the Orange River region was fairly densely occupied by the Bushman and Khoekhoe during historical times (Penn 2005) and, in some areas, many archaeological sites reflecting this occupation have been found (Beaumont *et al.* 1995). One of the most important of these was initially documented in 2016 by Orton (2019a) and further studied by Johnson (2019). It is a very large nineteenth century encampment with strong Stone Age and historical signatures (i.e. contact period) and includes a number of stone-packed graves. This site lies 11.5 km northeast of the present study area but, surprisingly given its size, is about 14 km away from the Orange River.

A small survey by Paleo Field Services (n.d.) in the mountains to the north of Aggeneys failed to yield any heritage resources, but a rock art site is known to occur on a free-standing boulder to the west of the town (Morris 2011a). The painting is a finger painting, likely associated with the Khoekhoen. Similar art is found on granite outcrops throughout Namaqualand and elsewhere in Bushmanland, but in very low densities (Orton 2013). Morris (2014) examined land to the southeast of the mine study area and reported scatters of quartz flakes associated with quartz outcrops, a small Later Stone Age (LSA) scatter of stone artefacts and ostrich eggshell on the summit of a hill, as well as a very ephemeral background scatter over some areas.

Some of the place names in the region reflect the living heritage of the Khoekhoen. Ghaamsberg (also Gamsberg), for example, derives from the Khoekhoen word meaning 'grassy spring' (Raper n.d.). This mountain lies some 48 km south-east of the present study area and also houses one of the very few rock shelter deposits known from the region (Orton 2014). There are unconfirmed historical reports that a massacre of Bushmen may have occurred in a kloof of the Ghaamsberg (Robinson 1978), but surveys have failed to yield any evidence. Another name with its origin in the Khoekhoe language is Goodhouse which come from "Gudaos" (sheep ford) and is said to have been a place where the Nama herded their sheep across the Orange River (Raper n.d.).

Few field assessments have been carried out in the immediate area but those that have been done show very little archaeology to be present (Orton 2019a, 2019b; Van Ryneveld 2017). Stone-packed graves have, however, been observed to the east of the study area (Orton 2019a).

5.2.2. Site visit

Given the very rocky nature of the study area away from water sources, Stone Age archaeological materials were not expected. However, on top of the koppie a few places were noted where flakes had been removed from the outcrop (S29° 04' 31.1" E18° 30' 01.4"E; Figures 21 & 22). This outcrop flaking is commonly observed throughout Bushmanland and simply indicates that Stone Age people

climbed the koppie and made use of the quartz outcrop as a stone source for tool manufacture. This might have occurred during the Middle (MSA) or Late Stone Age (LSA). A few quartz flakes were also seen amidst the extensive quartz debris that typically characterises these outcrops. Just one stone artefact was seen during the remainder of the survey. This was a flake on a CCS pebble (presumably brought from the Orange River) that was seen at the base of the koppie on its north-eastern side (Figure 23). Judging by its weathered state, it probably pertains to the MSA. Also seen were the remains of earlier mining activity. A piece of an old Pepsi-Cola bottle was seen (Figure 24) as were some foundations (Figures 25 to 28). None of these is older than the mid-20th century and they are of no heritage significance. Online research suggests that the bottle likely dates to the 1950s.



Figure 21: Example of flaking of the quartz outcrop. Scale in cm.



Figure 22: Example of flaking of the quartz outcrop. Scale in cm.



Figure 23: The only stone artefact seen during the survey. Scale in cm.



Figure 24: An old Pepsi-Cola bottle found near the base of the koppie.



Figure 25: A foundation from the eastern side of the koppie.



Figure 26: A foundation from the eastern side of the koppie.



Figure 27: A foundation from the eastern side of the koppie (looking west).



Figure 28: Looking east at the same foundation shown in Figure 27.

An overhanging wall to the south of the koppie was examined for archaeology but found to only contain mid-late 20th century tins and glass bottle fragments assumed to relate to camping miners.

5.3. Graves

No graves were seen in the study area, although graves are known to occur in the wider area and a historical grave was noted near the main gravel road in the north alongside a farm track (Figure 29; S29° 00' 25.8" E18° 30' 15.2") – this is not the track proposed to be used for the project though, because it is longer and runs in the wrong direction. It was, nonetheless, considered prudent to place the grave location on record. There is no chance of intersecting graves in this project and this aspect therefore requires no further consideration.



Figure 29: Historical grave seen 7.5 km north of the study area.

5.4. Historical aspects and the Built environment

5.4.1. Desktop study

The site is in a very remote location with large farms and few buildings. No structures were seen from the mine study area or anywhere along its access track. The only historical building known to the author in the vicinity lies 23 km to the east (Orton 2019a, 2019b).

5.4.2. Site visit

No historical or built environment resources were noted in or near the study area. All traces of earlier mining are from the mid-20th century or later and are of no heritage concern. This aspect of heritage requires no further consideration.

5.5. Cultural landscapes and scenic routes

The site is very remote and located well away from all public roads. The landscape is almost exclusively natural, with the obvious exception of the earlier mining activities. The landscape has a

generally high degree of intactness and, with its stark contrasts of black, white and red (see photographs above), is certainly aesthetically pleasing. This means that it does have cultural significance. Although the landscape is certainly scenic, the very limited number of road users in the area suggests that the gravel road to the north cannot be considered a scenic route. The N14, to the south, can be, but it is well away from the study area and the mine would not be visible from that road.

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).

The archaeological resources are deemed to have low cultural significance for their scientific value and are graded GPC.

The cultural landscape is deemed to have medium-high cultural significance for its aesthetic value².

5.7. Summary of heritage indicators

Archaeological resources and graves are very sensitive to disturbance.

- Indicator: Archaeological resources and graves should not be disturbed without appropriate professional intervention as might be needed.

The cultural landscape is visually sensitive to disturbance from inappropriate development. Mining can have a significant impact on the aesthetic qualities of the landscape.

- Indicator: The development should visually dominate the landscape from public viewpoints.

6. ASSESSMENT OF IMPACTS

6.1. Impacts to archaeological resources

Direct impacts to archaeological resources may occur during the construction and operation phases of the project. Although impacts to archaeological resources will happen and are permanent, the cultural significance of the known material is extremely low and thus the intensity is rated low and the overall expected significance is **low negative**. No mitigation is required and thus the impact significance remains unchanged. There are no fatal flaws in terms of archaeology.

Table 2: Assessment of impacts to archaeological resources.

Potential impacts on palaeontological resources	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, permanent
Intensity	Low

² The SAHRA grading system does not apply to cultural landscapes.

Probability of occurrence:	Definite
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:	None required
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.2. Impacts to the cultural landscape

Direct impacts to the cultural landscape would occur during all phases. Despite the permanence of the impact, given the remoteness and lack of visibility of the site, this impact is of very little concern and is rated as low intensity with a significance of **low negative**. No mitigation is possible and none is suggested since the final appearance of the koppie will not differ much from the surrounding koppies other than that its shape will differ. The proposal is therefore acceptable without any mitigation and there is thus no change to the impact significance. There are no fatal flaws in terms of the cultural landscape.

Table 3: Assessment of impacts to the cultural landscape.

Potential impacts on the cultural landscape	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, short term
Intensity	Low
Probability of occurrence:	High
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:	Low
Proposed mitigation:	None possible
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

6.3. 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.

6.4. The No-Go alternative

With implementation of the No-Go option the landscape would remain as it currently is with an unsecured mine. The koppie would retain its current shape which is similar to the original but with 'pieces' missing. While there would be a marginal benefit to the landscape if the project were not

implemented, there is no meaningful difference in terms of archaeology. The overall impact significance for the No-Go option could thus be considered **neutral**.

6.5. Cumulative impacts

Although a few mines operate in the wider region, they were well scattered. The remote location and limited impact of the proposed quartz mine will make virtually zero contribution to cumulative impacts.

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 difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. Because of the height of the majority of the proposed development, such an impact is not envisaged.

7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

No management measures related to heritage are required.

8. 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. This project will provide a small number of jobs and therefore does have a socio-economic benefit. The impacts to heritage are very minor which means that the socio-economic benefits outweigh the heritage impacts.

9. CONSULTATION WITH HERITAGE CONSERVATION BODIES

No dedicated heritage consultation has been undertaken because the project is part of an application under NEMA and a full public participation process (PPP) that includes the heritage report will be undertaken.

10. CONCLUSIONS

There are no significant heritage concerns for this project. Two heritage indicators were proposed but neither has been found to be of concern (Table 4). No areas require avoidance.

Table 4: Heritage indicators and project responses.

Indicator	Project Response
Archaeological resources and graves should not be disturbed without appropriate professional intervention as might be needed.	No response required since no significant impacts will occur.
The development should visually dominate the landscape from public viewpoints.	The site was found to be far from local roads and the closed mine will not result in any significant impacts to the landscape.

10.1. Reasoned opinion of the specialist

Given the very limited impacts and very low significance of those impacts it is the opinion of the heritage specialist that the project should be authorised in full.

11. RECOMMENDATIONS

It is recommended that the project be allowed to proceed but subject to the following recommendation:

- 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.

12. REFERENCES

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Van Ryneveld, K. 2017. Koa Valley Prospecting Right Application (without Bulk Sampling), Portions of the Farms Haramoep 53, Oonab-Noord 609, Amam 46 and Nooisabes 51, near Springbok / Aggeneys, Namakwa District Municipality, Northern Cape. Report prepared for Environmental Impact Management Services. Beacon Bay: ArchaeoMaps.

APPENDIX 1 – Curriculum Vitae



Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 40 Brassie Street, Lakeside, 7945
Telephone: (021) 789 0327
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 –
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.

