ARCHAEOLOGICAL MITIGATION AT THE OENA MINE, RICHTERSVELD, NORTHERN CAPE PROVINCE

Permit ID: 3054, Case ID: 14221

Report for:

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SUMMARY

ASHA Consulting (Pty) Ltd was appointed by African Star Minerals (Pty) Ltd to conduct archaeological mitigation of a number of sites at their Oena Diamond Mine in the Richtersveld, Northern Cape. The sites were located in three sections of the mine as follows:

- Oena Proper (S28° 03' 50" E17° 01' 25");
- Sandberg (S28° 02' 35" E17° 03' 30"); and
- Blokwerf (S28° 03' 55" E17° 06' 50").

Scatters of artefacts located on the extensive cobble terraces were found to be largely from the Early Stone Age (ESA), but included some artefacts from the Middle Stone Age (MSA) and occasionally the Later Stone Age (LSA). These scatters were essentially part of the background scatter since these artefacts occurred widely across the terraces. Quartzite was by far the dominant material used for flaking at these scatters and it was clear from the high incidence of cortical flakes that the terraces were being used to source stone materials for tool production. The low incidence of formal artefacts suggests that these items were either removed from the terraces or else manufactured elsewhere once suitable pieces of stone had been identified.

The sites located along the foot of the mountains were either LSA or MSA in age. The MSA materials were largely adiagnostic quartz flaked artefacts. They are assumed to be MSA in age but some could even be from the earlier parts of the LSA. With such materials it is currently not possible to distinguish. The LSA sites all had pottery on them. Strangely, other categories of materials were rare or absent. Especially surprising was the lack of stone artefacts and ostrich eggshell fragments which are normally so common on LSA sites from throughout the drylands of north-western South Africa. The LSA sites all represent small camps where people stopped for perhaps one night. Some of them may have been used on multiple occasions but the preserved materials do not allow a distinguishing of such fine details. The most intriguing site (BW2009/001) was one that appears to have been a lunch stop where someone made a small fire under a tree, cooked and ate some fish, broke a pot (either accidentally or deliberately) and moved on.

The mitigation work is deemed to have captured a good sample of the archaeology of the Blokwerf, Sandberg and Oena Proper mining areas, although the earlier mining of two of the scatters at Oena Proper (OP2009/003 and OP2009/010) did reduce the amount of material that could be collected there.

It is recommended that SAHRA endorse this report as proof of compliance with the mitigation requirements at Blokwerf, Sandberg and Oena Proper. However, the following should be noted:

- If, during the course of mining, any dense concentrations of archaeological material or any human remains (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 SAHRA 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

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.

Core: An artefact from which pieces of stone have been deliberately removed during the production of stone artefacts.

Cortex: The natural outer surface of a stone, cobble or rock.

Dorsal surface: the side of a flake that was visible on the core prior to the removal of the flake. It often bears the scars of previous removals or could have cortex preserved.

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

Flake: A piece of stone removed from a core and which is recognisable by the presence of at least some of the following features: dorsal and ventral surfaces, a striking platform and a bulb of percussion.

Handaxe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry.

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominin: a group consisting of modern humans, extinct species of humans and all their immediate ancestors.

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

Large cutting tool: A generally bifacially flaked stone tool that can have a range of forms. Most would be referred to as handaxes but artefacts not falling to into that category also occur.

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

Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

Striking platform: That part of a flake that formed part of the surface which was struck when the flake was produced.

Ventral surface: The side of a flake that was formed when the flake was removed from a core.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BGS: Background scatter

BIF: Banded Iron Formation

CRM: Cultural Resources Management

ESA: Early Stone Age

GPS: global positioning system

LCT: Large Cutting Tool

LSA: Later Stone Age

MSA: Middle Stone Age

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

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by African Star Minerals (Pty) Ltd to conduct archaeological mitigation of a number of sites at their Oena Diamond Mine in the Richtersveld, Northern Cape (Figures 1 & 2). The sites were located in three sections of the mine as follows:

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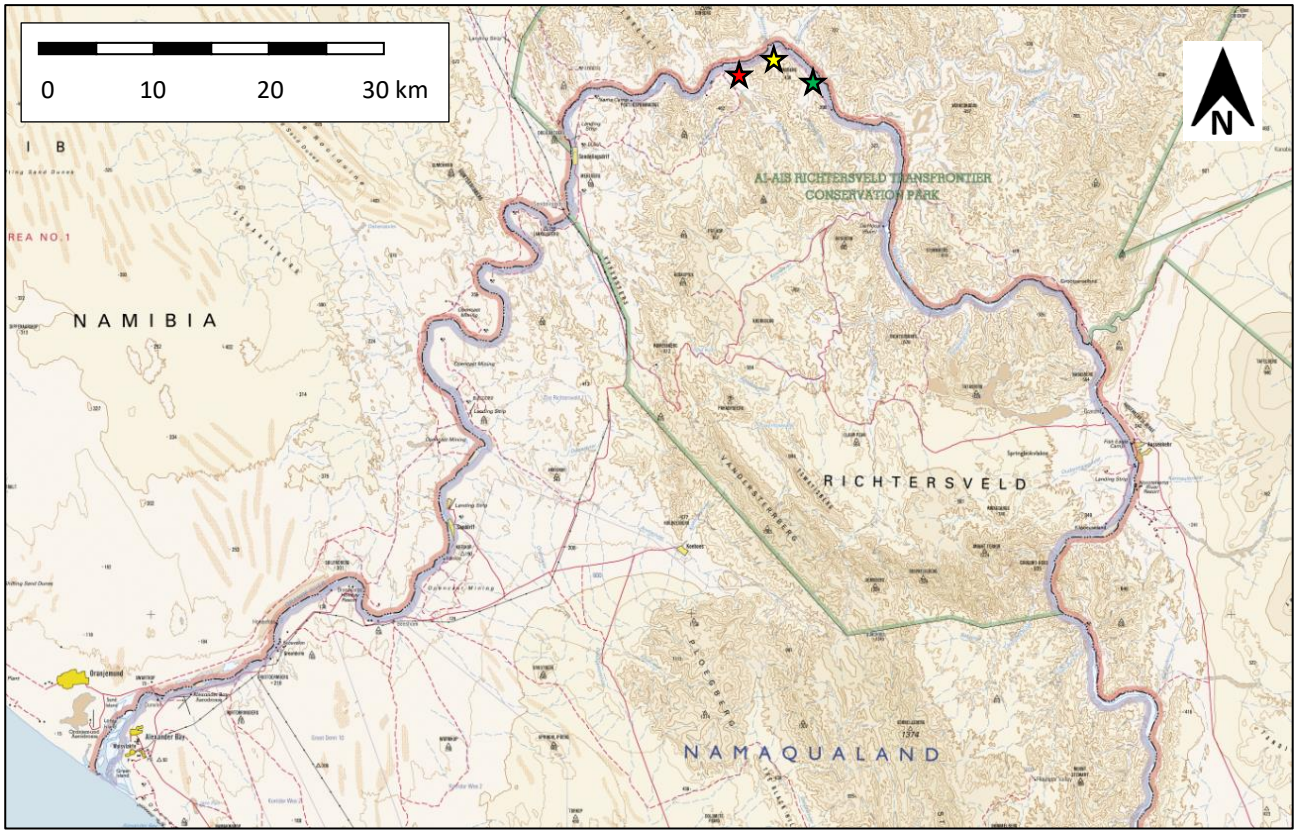

Figure 1: *Extract from 1:250 000 mapsheet 2816 showing the location of the Oena Mine Mine in the northernmost part of the Richtersveld. The red star marks Oena Proper, the yellow is Sandberg and the green Blokwerf. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.*

An earlier impact assessment study had reported a total of ninety archaeological sites and occurrences, of which twenty-one were located at Oena Proper, two at Sandberg and fifty at Blokwerf (Orton & Webley 2009). The remainder where in two further mining areas – Visrivier and Kabies – for which permission to mine has not yet been granted and which were not completely surveyed. Altogether, SAHRA requested mitigation of 19 sites – four at Oena Proper, one at Sandberg and eleven at Blokwerf, with the last three at Visrivier and Kabies (these last were not mitigated). The mine is an open cast diamond mine working the palaeoterrace gravels along the left bank of the Orange River. Mining is not allowed on the silt-covered active floodplain and the Phase 1 survey thus focused on the base of the mountains, the cobble/gravel terraces and the interface of the gravels and the silty floodplain. Sites were found in all of these locations and some from each location are included in the list of mitigated sites.

The mitigation work was conducted under Permit ID 3054 (Case ID: 14221).

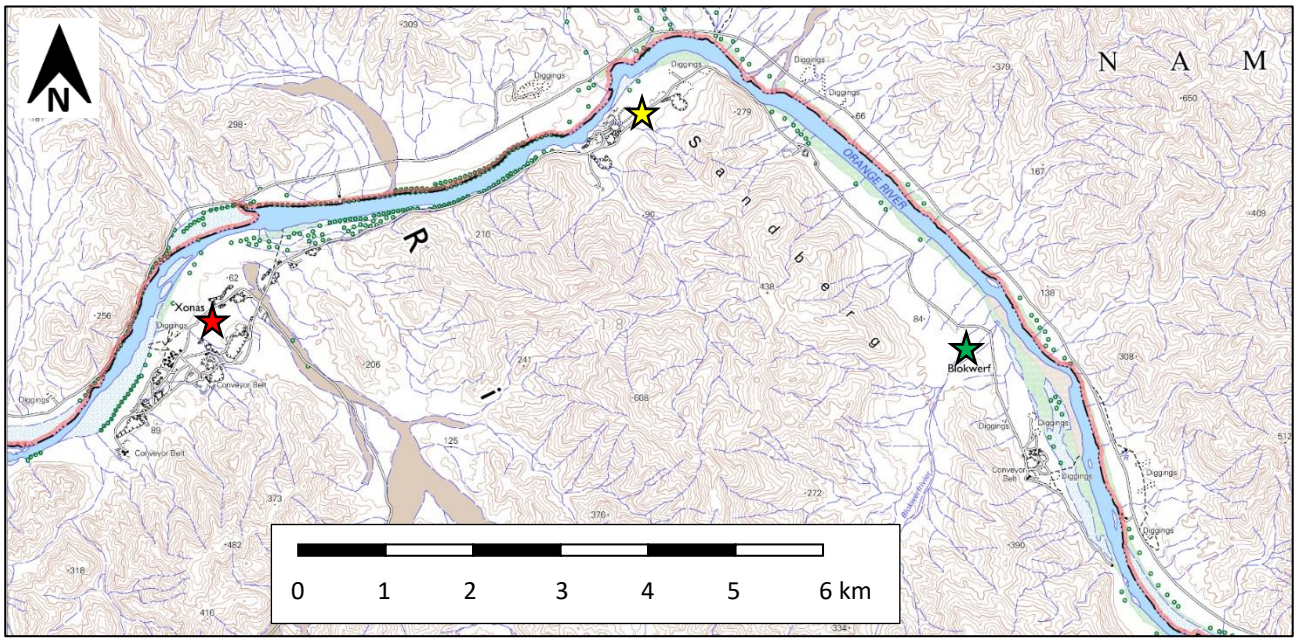

Figure 2: *Extract from 1:50 000 topographic map 2817AA showing the location of the Oena. The red star marks Oena Proper, the yellow is Sandberg and the green Blokwerf. Note that the mining areas include all of the level areas up- and downstream of the stars. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.*

1.1. Terms of reference

ASHA Consulting (Pty) Ltd was asked to conduct the required mitigation work and prepare and submit a report to SAHRA for approval.

1.2. Scope and purpose of the report

The mitigation report is intended to describe the work carried out on site as well as the findings of the laboratory analyses. This information is to enable SAHRA to decide whether to accept the report and also to create a record of the archaeology of the area that can be consulted by others.

1.3. 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.

1.4. 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. METHODS

2.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context of the area so as to assist with interpretation of the results. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The maps were sourced from the Chief Directorate: National Geo-Spatial Information.

2.2. Excavations

The sites varied in nature and different strategies were taken as necessary. These were as follows:

1. Formal grid excavation: At some sites (BW2009/001, BW2009/003, BW2009/005, BW2009/017 (see also point 3), BW2009/020, BW2009/022, BW2009/031, SB2009/002) a grid of 1x1 m was laid over the sites and all materials from each square were excavated and collected with the aid of a 3 mm sieve. A smaller sized sieve could not be used because of the massive quantities of very tiny rock fragments that result from weathering of the local rocks, especially the schist and granite. In one instance (BW2009/001) these squares were split into 0.5x0.5 m squares in order to gain higher resolution in a part of the site.
2. Surface collection with waypoints: At one site (BW2009/004) visible surface materials were collected from seven locations with Global Positioning System (GPS) waypoints taken to mark them. At another (BW2009/044) an isolated artefact was collected and given a GPS waypoint location.
3. Surface collection within grid: At one site (BW2009/044) that was located on a dense gravel exposure a grid of 2x2 m squares was laid out and every artefact visible in each square was collected by hand. At another (BW2009/017) the artefacts were found through the excavation of a few squares to be restricted to the surface. The remaining 1x1 m squares at this site were therefore hand-collected.
4. Surface collection: At some sites (BW2009/048, BW2009/049, OP2009/004, OP2009/012) the artefact density did not merit a formal gridded collection, since low density artefacts were spread over wide areas of gravel and cobble terrace, often at a density of perhaps one artefact per 5 to 10 m^2. All artefacts seen in the vicinity of the waypoints were collected.

Two sites (OP2009/003, OP2009/010) were found to have already been mined and thus could not be sampled. Both were recorded by Orton and Webley (2009) as scatters of mixed age artefacts on the cobble terrace.

A GPS was used to record tracks during the work in case these were useful. In the event they assisted with the determination of the area over which artefacts were collected at the surface collection sites.

SAHRA had requested pottery collection at three of the sites and full sampling at the rest. A re-evaluation was made on site and two of the three pottery collection sites (BW2009/003 and SB2009/002) were sampled formally. BW2009/005 was still considered suitable only for collection of the surface finds.

2.3. Analysis

The diversity of archaeological materials recovered was low. Stone artefacts, pottery and ostrich eggshell fragments accounted for the vast majority with bones and charcoal being recovered from just one site. These classes of materials were analysed as follows:

- The stone artefact analysis made use of the standard terminology for waste items typically employed in Later Stone Age (LSA) studies. Other commonly used terms were added as required but these were few. The latter included 'retouched flake', 'retouched chunk', 'notched flake', 'unifacial point', and 'Large Cutting Tool' (LCT). In rare instances where these were likely to be useful to others, measurements of stone artefacts were taken. The presence of cortex on the artefacts was also recorded for those sites located on the cobble terraces.
- It should be noted that the collections, especially those from the cobble terraces, contained many artefacts with some degree of minor edge-damage. The evaluation of this damage was necessarily very subjective with the following three possibilities considered:
    - The lightest damage was ignored and assumed to have been post-depositional;
    - Damage that seemed heavy enough to be anthropogenic but not concentrated enough to be retouch was listed as 'edge-damaged'; and
    - Damage that was concentrated and/or consistent enough, often with slightly larger scars, was referred to as 'retouched'.
- Ostrich eggshell fragments were counted and weighed.
- Pottery was weighed per square and the thickness of each sherd was calculated through measuring their maximum and minimum thicknesses. When the sherd was very small only one measurement was taken. In some instances one surface was exfoliated away and no measurements could be taken. The assemblage was further generally described in terms of sherd colour and the presence of features such as rims, bosses and lugs. Rim orientations and lip forms followed Sadr and Sampson (1999) and Sampson and Sadr (1999).
- Bones were weighed and recorded in as much detail as possible by the author (non-faunal specialist).
- Charcoal was weighed.

It is notable that during analysis of the excavated MSA scatters (BW2009/017, BW2009/020, BW2009/022) a number of stones were discarded as they were found to be non-artefactual. They had been collected for precautionary reasons. This shows how it is often difficult to tell without close examination whether an item has been flaked or not.

At times, the artefacts were found to be coated in a hard crust and this had to be washed and scrubbed off. This applied at BW2009/020, BW2009/022, BW2009/031, BW2009/044, BW2009/048, BW2009/049 and, on a few artefacts only, to OP2009/004 and OP2009/012.

3. PHYSICAL ENVIRONMENTAL CONTEXT

The mine lies along the banks of the Orange River within the Richtersveld National Park. The palaeoterraces on which the sites were found are located between steep, rocky mountains and the silty floodplain alongside the river. Photographs showing the nature of the environment at each site will be presented below, while Orton and Webley (2009) can be consulted for an extensive photographic description of the broader study area. Figures 3 to 14 show aerial views locating the sites identified for mitigation (on all of them the blue lines are the GPS tracks recorded during the work; they are sourced from Google Earth and dated 25 October 2018).

Figure 3: *Aerial view of the Oena Proper mining area showing the locations identified for mitigation.*

Figure 4: *Detailed aerial view of part of the Oena Proper mining area showing the four locations identified for mitigation there. The white polygons indicate the areas sampled at OP2009/004 and OP2009/012.*

Figure 5: *Aerial view of the Sandberg mining area and the north-western end of the Blokwerf mining area showing the locations identified for mitigation.*

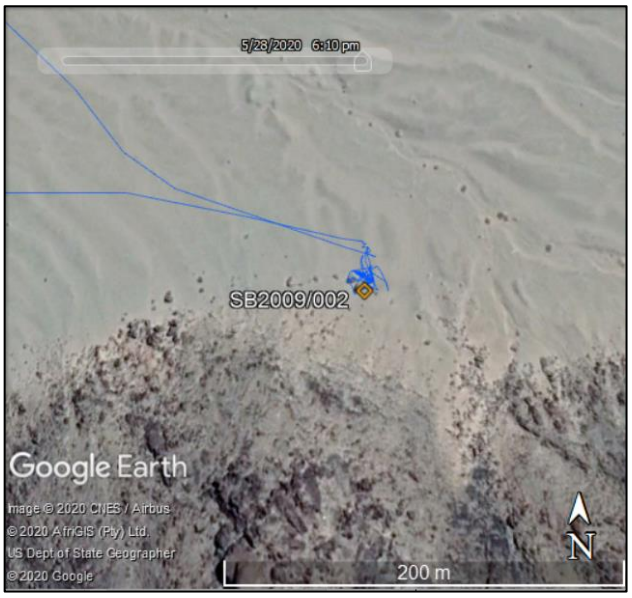

Figure 6: *Detailed aerial view of part of the Sandberg mining area showing the one location identified for mitigation there.*

Figure 7: *Detailed aerial view of the north-western end of the Blokwerf mining area showing the one location identified for mitigation there.*

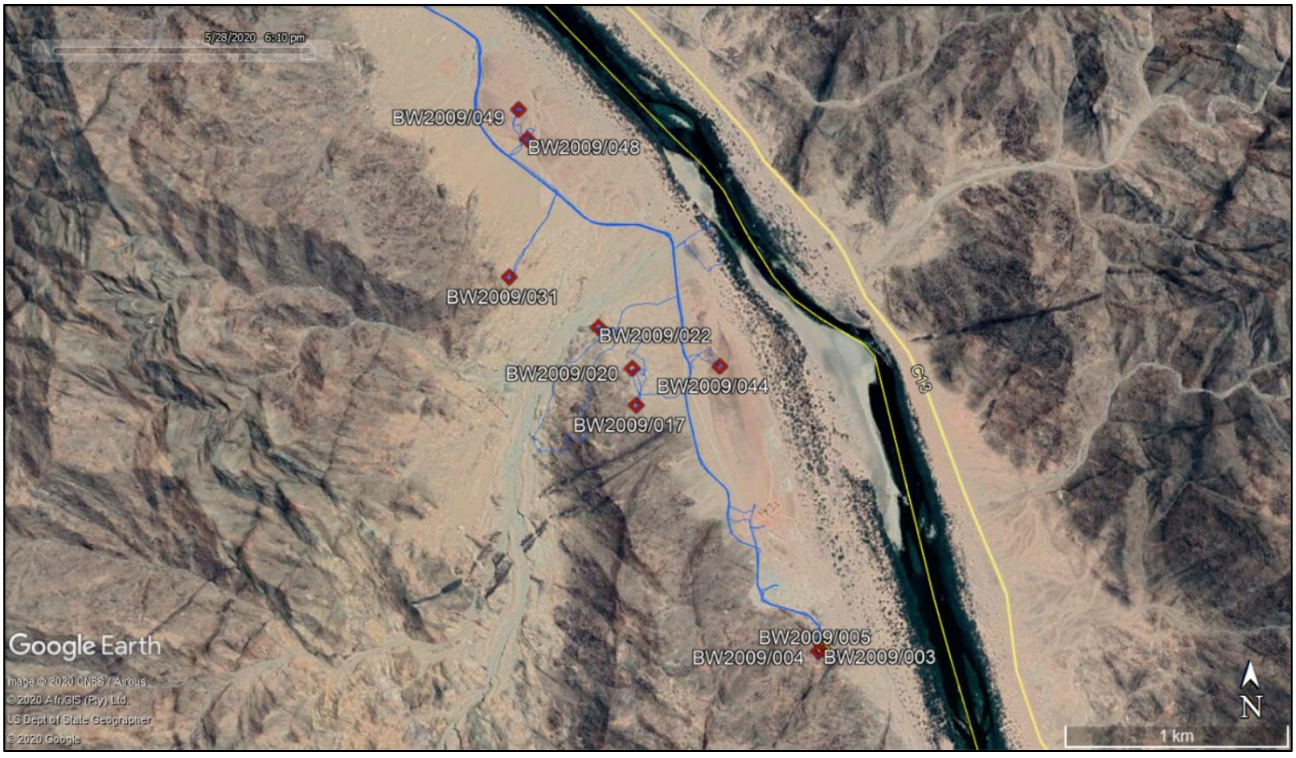

Figure 8: *Aerial view of the central and south-eastern parts of the Blokwerf mining area showing the locations identified for mitigation.*

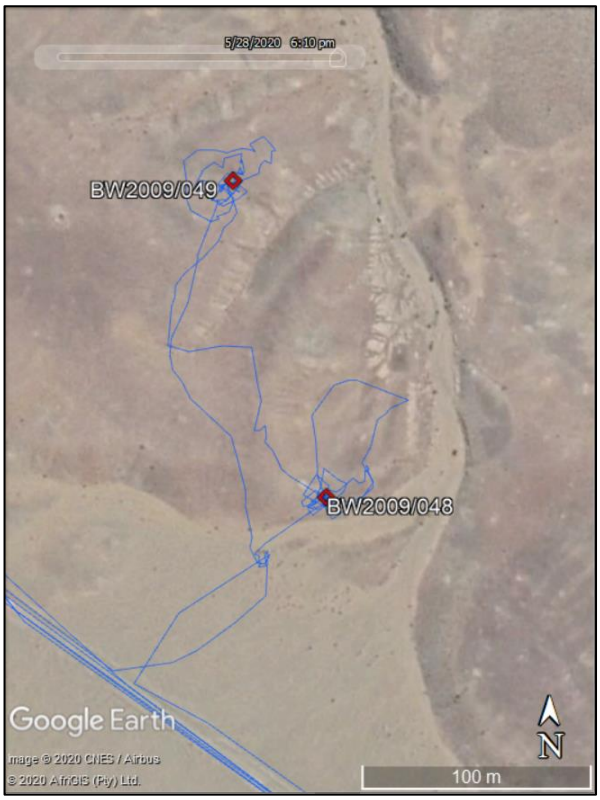

Figure 9: *Detailed aerial view of the central part of the Blokwerf mining area showing one of the locations identified for mitigation there.*

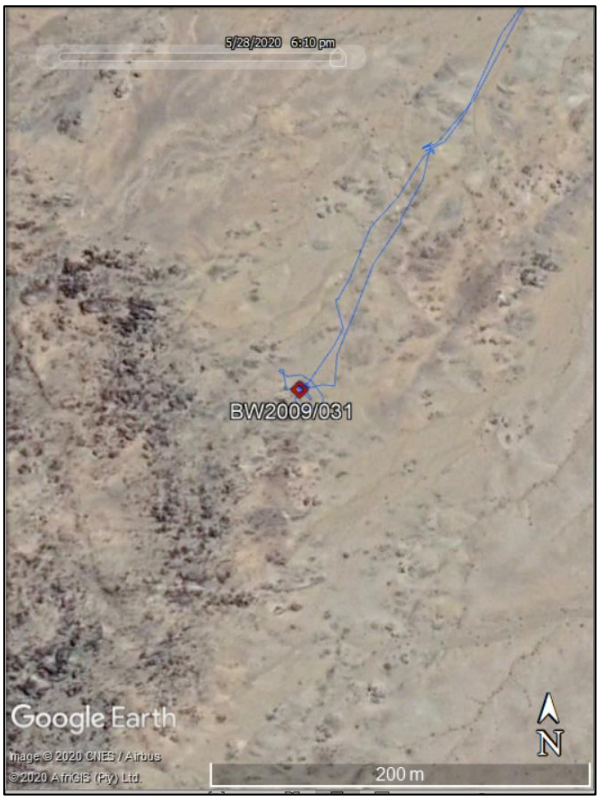

Figure 10: *Detailed aerial view of the central part of the Blokwerf mining area showing one of the locations identified for mitigation there.*

Figure 11: *Detailed aerial view of the central part of the Blokwerf mining area showing two of the locations identified for mitigation there.*

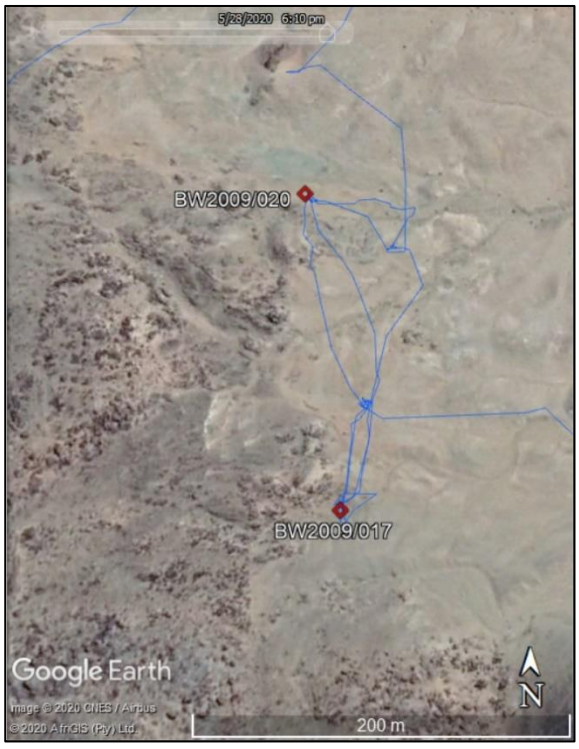

Figure 12: *Detailed aerial view of the central part of the Blokwerf mining area showing two of the locations identified for mitigation there.*

Figure 13: *Detailed aerial view of the central part of the Blokwerf mining area showing one of the locations identified for mitigation there.*

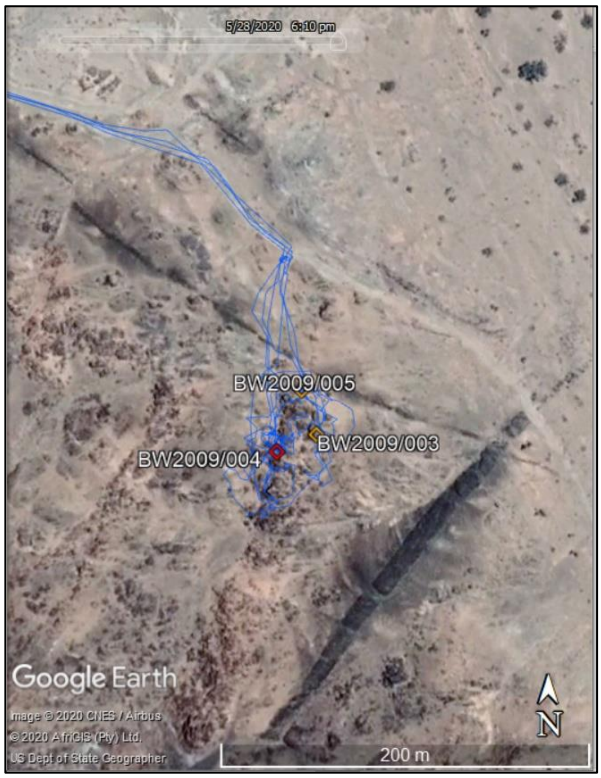

Figure 14: *Detailed aerial view of the southern part of the Blokwerf mining area showing three of the locations identified for mitigation there.*

4. DESKTOP STUDY

A brief desktop study is provided here to give archaeological context to the findings of the excavations. Very little archaeological research has been undertaken in the Richtersveld with the majority of it focusing on the Jakkalsberg area immediately downstream of Sendelingsdrif. Here, Webley (1997) excavated two sites occupied by Khoekhoe herders some 1300 years ago, and recovered stone artefacts, ostrich eggshell beads and fragments, bone tools, pottery and animal bones. The fauna included many sheep bones (Brink & Webley 1996). Metal artefacts were also recovered (Miller & Webley 1994). Two more sites dating to the pottery period were excavated by Halkett (2001; Orton 2007; Orton & Halkett 2010). JKBM was occupied just under 2000 years ago, while JKBK was occupied about 450 years ago. An unusual find at the former was some 'cakes' of ochre. Stone artefacts and pottery were present at both, while JKBK also had a large collection of fish bones.

Two far older sites were excavated nearby by Orton & Halkett (2001, 2010; Halkett 2001). JKBN was occupied mostly around 5000 years ago, but younger material is also present on the deflated silty surface. Most finds were stone artefacts and ostrich eggshell beads and fragments but pottery was also present (the pottery cannot be older than 2000 years). An unusual find at JKBN was a collection of denticulate artefacts, the largest such assemblage known from the subcontinent. JKBL was slightly younger having been occupied around 3500 years ago. It was a small campsite with stone artefacts and ostrich eggshell beads including large numbers of manufacturing fragments.

A short distance downstream from Jakkalsberg, Smith *et al.* (2001) excavated a 500 year old site that preserved ashy hearths, stone artefacts, pottery and ostrich eggshell beads and fragments. In the eastern Richtersveld Webley *et al.* (1993) excavated a site dating to more than 3000 years ago, although occasional potsherds did suggest some later visits as well. Stone artefacts and ostrich eggshell beads and fragments were recovered. /hei-/khomas (a.k.a. /Ai tomas or Vaalhoek) was excavated in the central/southern Richtersveld by Webley (1992, 2001). It revealed main occupations in the early first millennium AD and mid-second millennium AD. Pottery, stone artefacts and ostrich eggshell beads were recovered and the deliberate burial of animals was recorded. Domestic livestock bones were also found. Excavations at Die Toon, some 7-8 km from the Orange River in the eastern Richtersveld, revealed a shallow deposit with dates of 2457–2034 BC (Pta-5960) and 1451–1121 BC (Pta-5963; Webley *et al.* 1993). Two potsherds on the surface indicated at least sporadic visits during the pottery period but most of the deposit is more than 3000 years old.

Much further to the southwest, Dewar and Stewart (2012) have excavated a rock shelter that has both LSA and MSA deposits, while along the coast Boegoeberg 2 contained a late MSA shell midden (Klein *et al.* 1999). MSA deposits are generally rare. To the author's knowledge, no work has been done on open-air ESA and/or MSA assemblages in the Richtersveld.

5. FINDINGS OF THE EXCAVATIONS

This section describes the excavated sites and their contents.

5.1. BW2009/001

This site was located on the north-western side of a small silt mound at the inland edge of the silt floodplain. Patches of cobble terrace and silt layers are exposed to the northwest (Figure 15) and the cobble terrace itself rises a short distance to the southwest. In 2009 the site was recorded as a scatter of just 11 pot sherds. However, on returning in 2020 erosion had revealed many more sherds (Figure 16) and justified a full excavation rather than merely a surface collection of the pottery as was intended. Site excavation data are provided in Table 1.

Table 1: *Site data for BW2009/001.*

Site location:	S 28 02 37.0 E 17 05 34.2
Landscape position:	Terrace/floodplain interface
Sampling methodology:	Formal grid excavation
Area sampled:	21 m^2 excavation
Sieve mesh size:	3 mm
Find categories:	Pottery, charcoal, fish bones
Age of site:	LSA (<2000 BP)

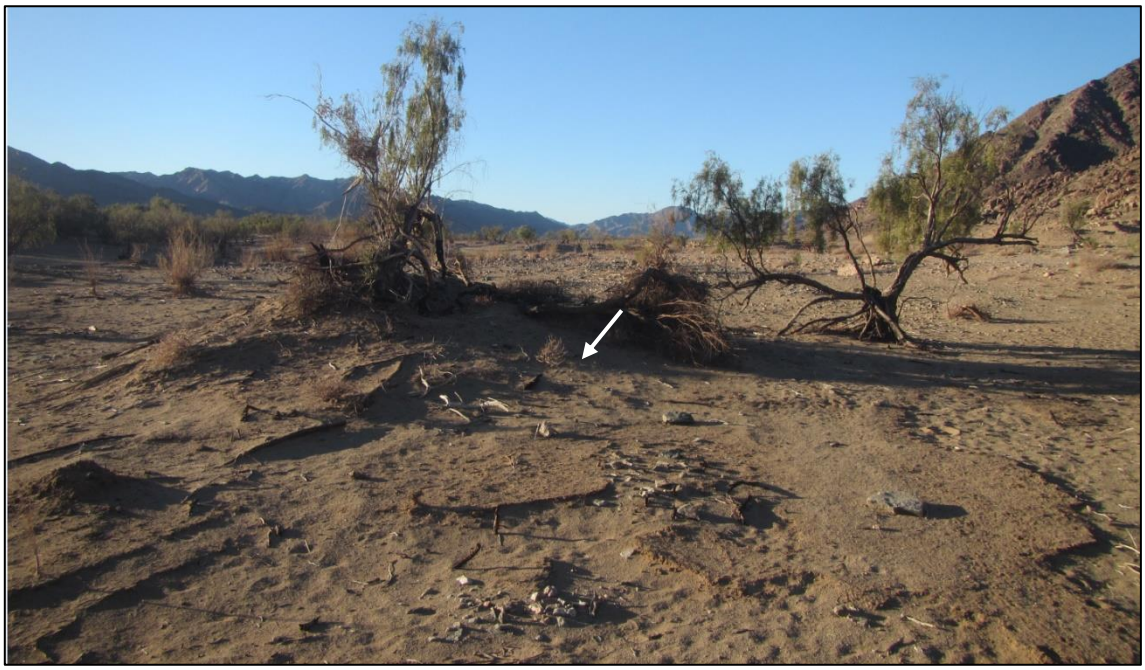

Figure 15: *View towards the southeast with the location of the site arrowed and with patches of cobble terrace visible in the foreground. The Orange River is behind the belt of trees to the left. Note that in 2009 the central tree on the mound was still standing. The exposed roots of the right hand tree show that the surface is eroding and preserved silt surfaces are visible in the foreground.*

Figure 16: *Close-up view of part of the BW2009/001 pottery scatter. Scale bar = 0.5 m.*

Twenty contiguous square meters were excavated to the west of the silt mound with a further one square meter to the east where a single potsherd was seen (Figure 17); this had no doubt been moved from its original by someone at some point. Three of the squares were split into quadrants

as shown in Figure 18 to potentially facilitate refitting of the pot sherds. During excavation it was found that the site had been buried and was actively eroding from the silt mound. Aside from the fact that so many more sherds were present on the surface eleven years after first being recorded, the excavation also showed that the hearth and fish bones, which were located furthest into the mound, were in fact preserved beneath intact silt surfaces (Figure 19) which had eroded away further to the west.

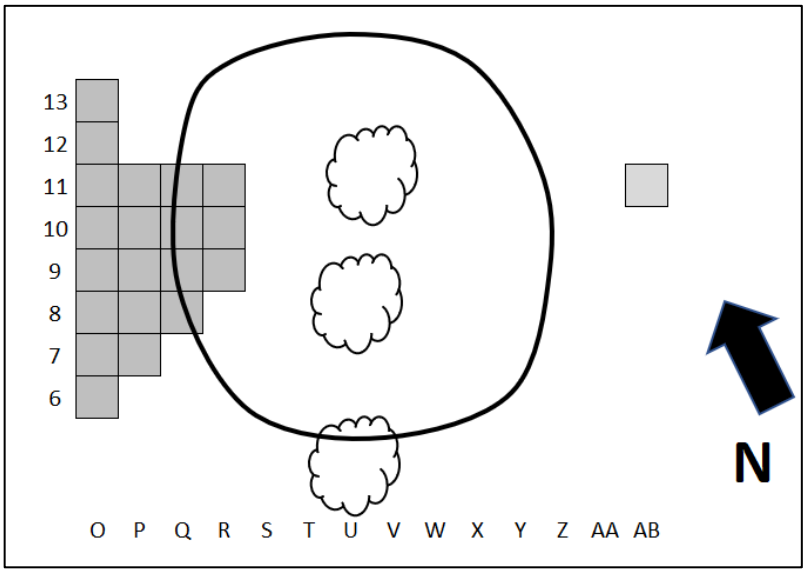

Figure 17: *Plan of the excavation grid at BW2009/001 relative to the silt mound (bold line) and three trees (the central one had collapsed since 2009).*

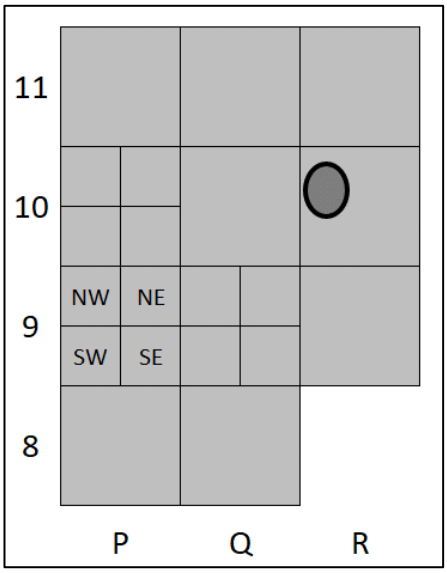

Figure 18: *Detailed plan showing squares split into quadrants. The location of the hearth is shown (dark grey oval).*

Figure 19: *Close-up view from square Q11of one of the intact fine silt surfaces (on higher level) that sealed in the hearth. Sand and silt occur between the surfaces.*

Figure 20 shows a schematic cross-section through the mound illustrating how the silt layers have eroded away exposing not only the archaeology but the surface of the cobble terrace. The trees have no doubt contributed to the slowing of the erosion at this point and must have allowed the low silt stack to form in the first place. This probably means the site is quite recent.

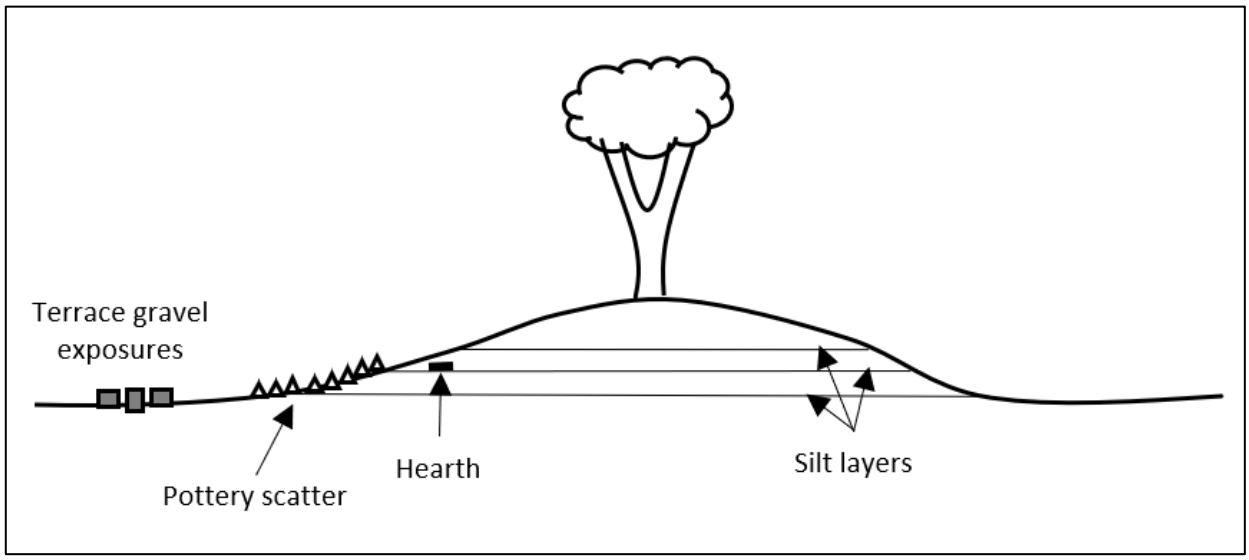

Figure 20: *Schematic cross-section through BW2009/001 looking towards the north showing the original location of the site in between silt layers.*

A small ashy hearth was found in the north-western corner of square R10 (Figure 18). It was identified by the darker staining in the silt and the presence of small charcoal nodules (Figure 21). There was minimal charcoal present, no doubt because the fire place lay exposed for some time before burial. There was also a typical rubified understorey which offers further evidence of burning. The hearth itself is mapped in Figure 22.

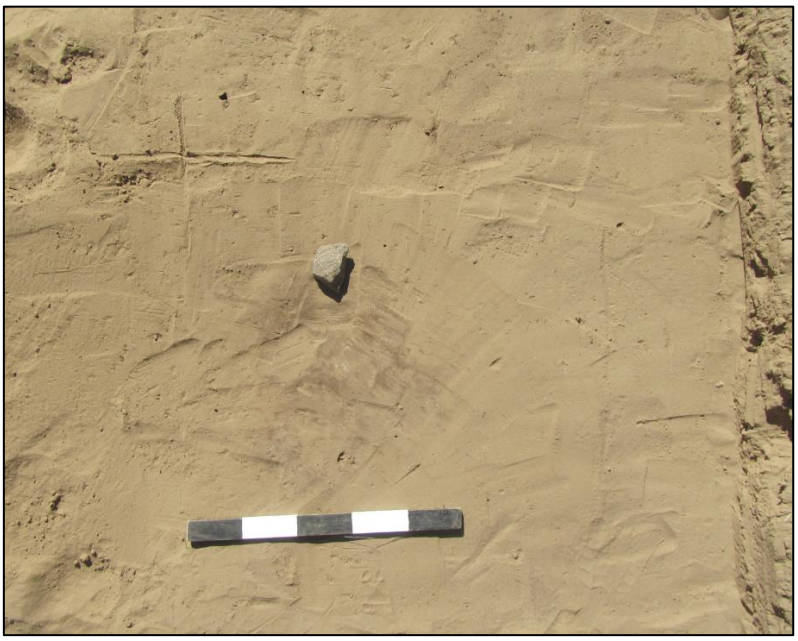

Figure 21: *View of the hearth showing the dark stain in the sand/silt. One small stone was associated with the hearth as shown. Scale bar = 0.5 m.*

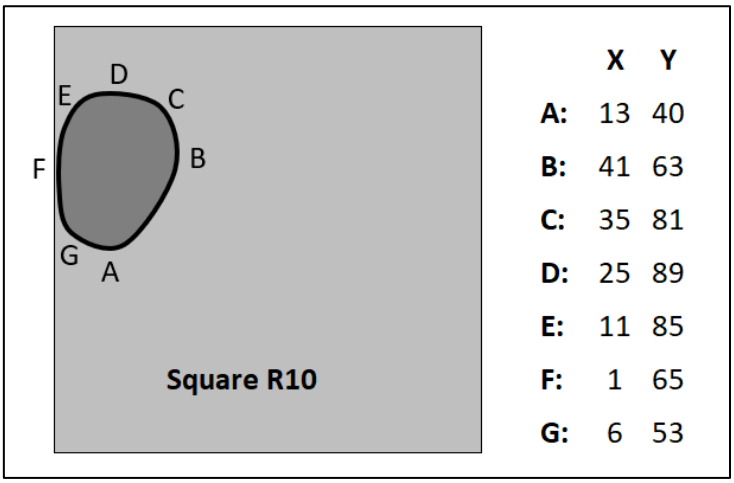

Figure 22: *Plan of the hearth showing the co-ordinates of eight pints describing its circumference.*

5.1.1. Pottery

The vast majority of finds made at the site was pottery. In total, 99 potsherds weighing 527.3 g were recovered. Figure 23 shows the distribution of pottery across the site by weight. Distribution by sherd numbers is less informative since there is massive variability in weight. The average thickness of the sherds was 5.43 mm with a range of 4.45 mm to 7.39 mm. This is thin-walled pottery typical of LSA contexts. The pottery is made of fired clay with mineral temper. The temper included quartz grains as well as a variety of other rocks, including gneiss fragments. Most grains are less than 1 mm in diameter but a good number were larger, sometimes up to 2-3 mm across (Figures 24 & 25). The sherds were generally light brown in colour on their outer surfaces, although a number were darkened from burning, showing that the pot was used in a fire (Figure 26). Some sherds showed evidence of smoothing with a hard item, since fine scratches were left across the surface of the clay (Figure 27). The inner surface of the sherds was generally light brown to orange-brown in colour and some were slightly darkened from burning, presumably also due to being in a fire. Smoothing was also evident on the inside, although it manifested slightly differently as greyed areas (Figure 28) but also with scratches (Figure 29). Seven rim sherds were found. All were slightly flared with a simple round profile. No decoration was present on any of the pottery. Two externally applied lugs were found (Figures 30 – 33).

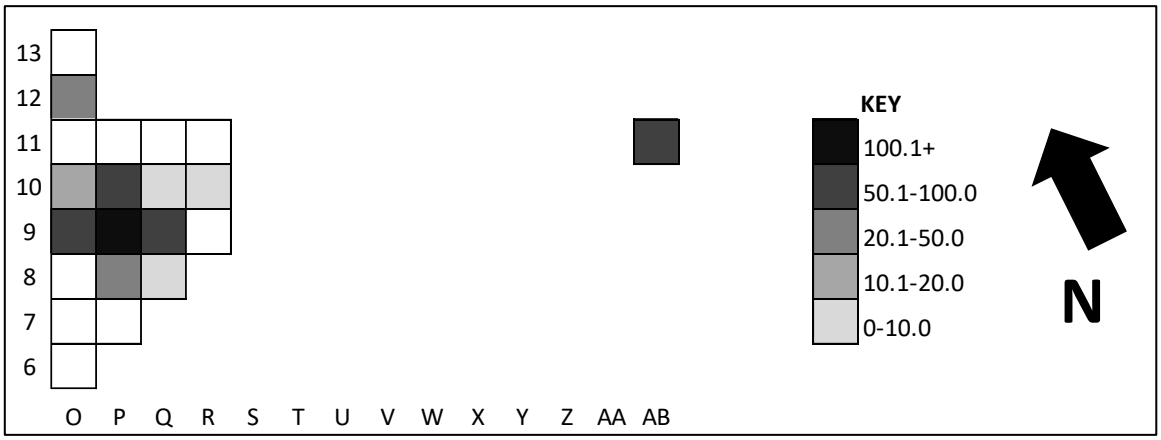

Figure 23: *Plan of BW2009/001 showing the distribution of pottery by weight. Just one sherd – a lug – came from AB11*

Figure 24: *Close-up showing variable temper exposed in a break.*

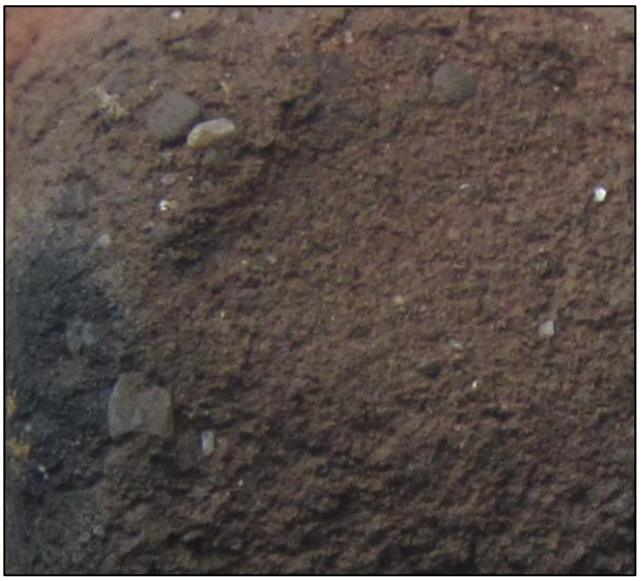

Figure 25: *Close-up showing variable temper exposed on the surface of a lug.*

Figure 26: *Example of the outer surface of a sherd (from P10 NE) showing the light brown colouring and burnt areas.*

Figure 27: *Close-up of the exterior surface of a sherd from P9NE showing surface smoothing.*

Figure 28: *Example of the inner surface of a sherd from P8 showing the smoothed areas (grey colour).*

Figure 29: *Close up of the inner surface of a sherd from P8 showing the grey smoothed areas with tiny paralel scratches.*

Figure 30: *Top view of the lug from square O9.*

Figure 31: *Side view of the lug from square O9 showing the hole.*

Figure 32: *Top view of the lug from square AB11.*

Figure 33: *Side view of the lug from square AB11 showing the hole.*

5.1.2. Bone

Bones were found in just three squares, although O6 had a single small bone (0.1 g) that is very unlikely to be related to the site. Figure 34 shows the distribution of bones by weight. Square Q10 had fish bones weighing 0.3 g, while square R10 had fish bones and possibly one other bone (again possibly unrelated to the site) weighing 1.7 g (Figure 35).

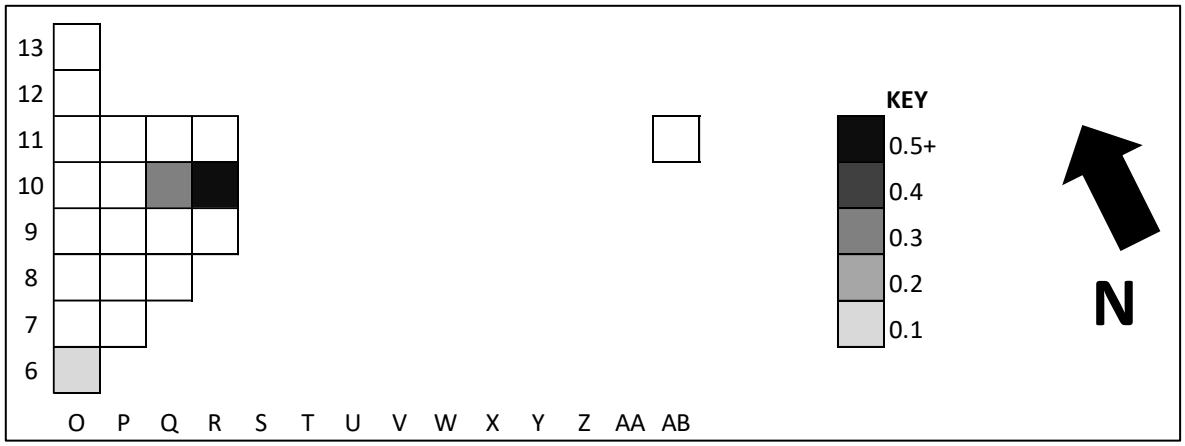

Figure 34: *Plan of BW2009/001 showing the distribution of bones by weight (g).*

Figure 35: *The bones from square R10. All are fish bones, although that at upper right may be of another animal. A single burnt bone is included (dark grey colour)*

5.1.3. Eggshell

A single tiny fragment of bird eggshell was found in square R9 and is almost certainly unrelated to the site.

5.1.4. Stone

A single piece of schist and some fragments of the same were found in square R10 in the hearth. The stone weighed 276 g and measured about 90 mm by 60 mm by 30 mm.

5.1.5. Discussion

This site clearly represents a very short term 'occupation', perhaps only an hour or two. The most parsimonious explanation is that someone carrying a pot was passing by and stopped under a tree to cook and eat a fish. During the course of their visit they either broke the pot by mistake (or on purpose) or else deliberately buried it, perhaps with a store of something inside it. The site was buried by river silts and then over time the pot slowly became exposed through erosion and broke up leaving the scatter of sherds that was collected. Fortunately the hearth had not yet been exposed because it would otherwise have disappeared.

5.2. BW2009/003

This site was located on a rocky outcrop at the foot of the mountain in the far south-eastern end of the Blokwerf mining area. It is one of a cluster of three sites located on this granite ridge. Figure 36 maps the three sites relative to one another.

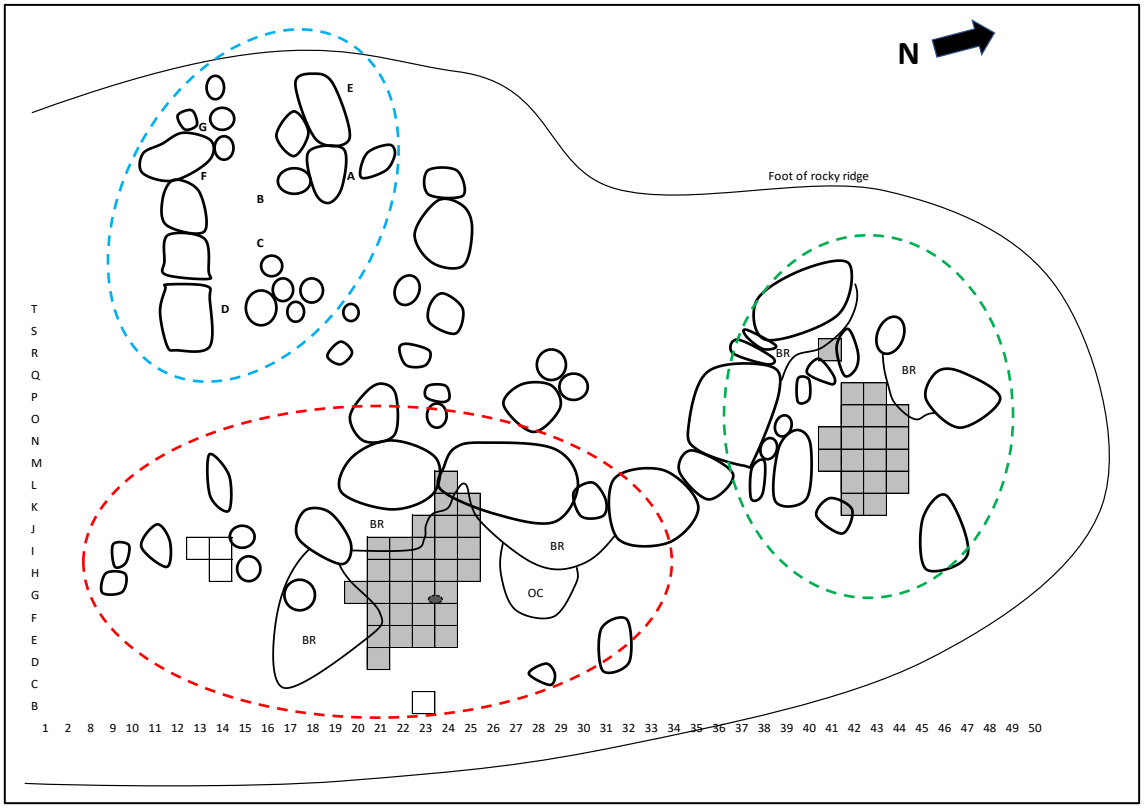

Figure 36: *Plan of BW2009/003 (red oval), BW2009/004 (blue oval) and BW2009/005 (green oval) showing their relative positions on the lower end of a granite ridge. Grey squares were excavated, white squares had artefacts collected from their surfaces. At BW2009/005 archaeological materials were collected from various positions among the boulders as shown by the letters A-G. The map shows the various boulders of the area (rocks and boulders occur everywhere but were only mapped comprehensive around the three sites). BR = bedrock; OC = outcrop of igneous rock.*

BW2009/003 was located on the eastern side of the foot of the granite ridge on a steep slope below some overhanging boulders (Figures 37-39). There were areas of exposed granite bedrock but in the middle there was an area where sediment had accumulated. Most of the archaeological material was on or close to this sediment body. Site excavation data are provided in Table 2.

Figure 37: *View towards the northwest of the granite ridge and boulders housing sites BW2009/003 (red arrow), BW2009/004 (blue arow) and BW2009/005 (green arrow).*

Figure 38: *View towards the north across BW2009/003 showing the two boulders beow which the scatter was located in mid-picture.*

Figure 39: *View towards the southwest showing the site after excavation.*

Table 2: *Site data for BW2009/003.*

Site location:	S 28 04 50.3 E 17 07 21.0
Landscape position:	Among boulders at foot of mountain
Sampling methodology:	Formal grid excavation & surface collection within grid
Area sampled:	30 m^2 excavation + 4 m^2 surface collection
Sieve mesh size:	3 mm
Find categories:	Pottery, stone artefacts
Age of site:	LSA (<2000 BP), but with older BGS

Thirty square meters were excavated, the majority of these being on the sediment accumulation in the centre of the site. In one area an ashy patch was found within the uppermost sediment but there was no charcoal associated with it (Figure 40). A sample of ashy silt was collected for possible future radiocarbon dating. The sediment was generally sterile with just one potsherd (in square G23) found completely buried.

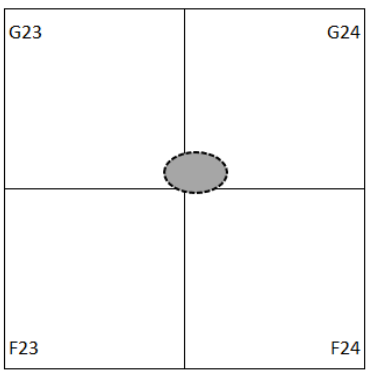

Figure 40: *Plan showing the location of the small ashy patch at BW2009/003.*

5.2.1. Stone artefacts

Just nine stone artefacts were found (Table 3). While some may be associated with the pottery which formed the bulk of the archaeological collection, others are likely to be older artefacts present on the landscape prior to the occupation that resulted in the deposition of the pottery; these are background scatter (BGS). Specifically, the two quartzite irregular cores were noted from their general form and edge rounding to likely date to the MSA. The 'other' irregular core was an igneous rock that had large quartz inclusions. All the removed flakes were from the quartz clasts. The distribution of artefacts is shown in Figure 41 and nothing more can be said of this tiny assemblage.

Table 3: *Stone artefacts from BW2009/003.*

Type	Quartz	Quartzite	Other
Single platform core	-	1	-
Irregular core	-	2	1
Bladelet	-	1	-
Flake	2	-	-
Chunk	1	-	-
Hammerstone/upper grindstone	-	1	-

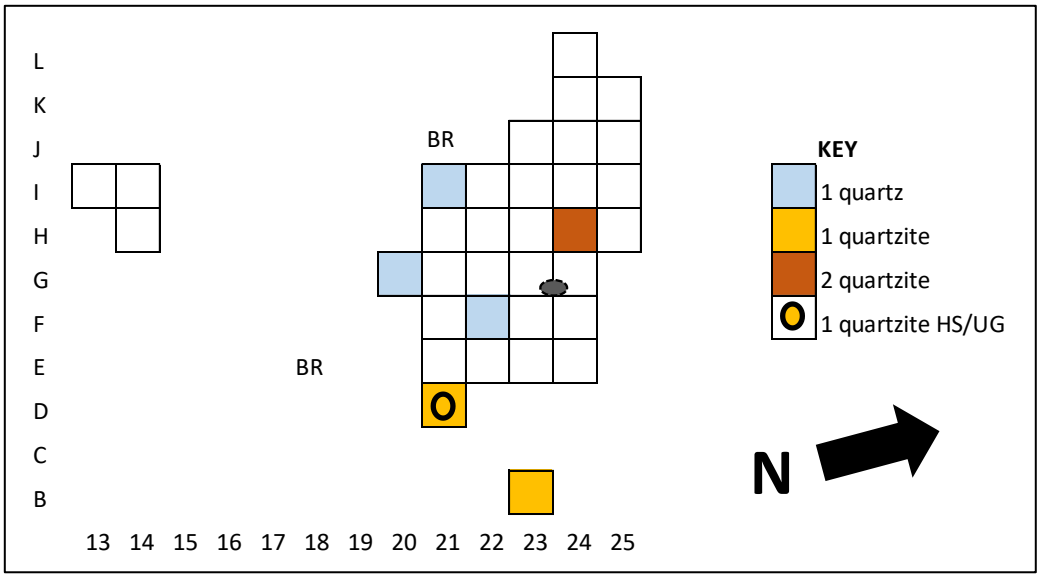

Figure 41: *Plan of BW2009/003 showing the distribution of stone artefacts. HS/UG = hammer stone/upper grindstone.*

5.2.2. Pottery

This site produced 36 pot sherds weighing 277.7 g. The majority of the sherds were quite weathered and some very small fragments were included in the sample. Visual examination suggested that the sherds originated from two different pots with thicker and thinner walls, respectively. The thicker pottery has a dark brown burnished external surface while the interior is red-brown to orange-brown. The thinner shreds tend to be grey on the outside and mid-brown on the inside. Their thicknesses varied from 3.38 to 6.17 mm but they did not separate out into two obvious groups (Figure 42). The overall average was 5.25 mm. Thickness does vary because pots are hand-made and this likely accounts for this lack of a clear distinction. A single rim sherd was found. It was decorated

by the addition of small elongated impressions, probably made with something like the end of a reed applied at an angle to the wet clay (Figure 43). The rim is vertically oriented and has a simple round lip form. Although rims are often thinner than the bodies of pots, it is likely that the rim belongs to the thinner pot. The collection also includes one lug which was made by adding extra clay to the inside of the pot prior to making the hole. As a result of some of the inside clay lump breaking away the wall thickness of this sherd could also be measured (Figures 44 & 45). The rim and lug were collected from the surface a few meters to the south of the excavation area (squares H14 and I13 respectively). Although the colour of the lug does not match the majority of the thin sherds, the balance of evidence suggests that it belongs with the thinner pot. The temper in all the pottery is variable in composition and size with igneous and quartz gains seen. Figure 46 shows the distribution of pottery by weight. The two very large sherds found in square L24 and the lug from I13 are evident by the large values in those squares.

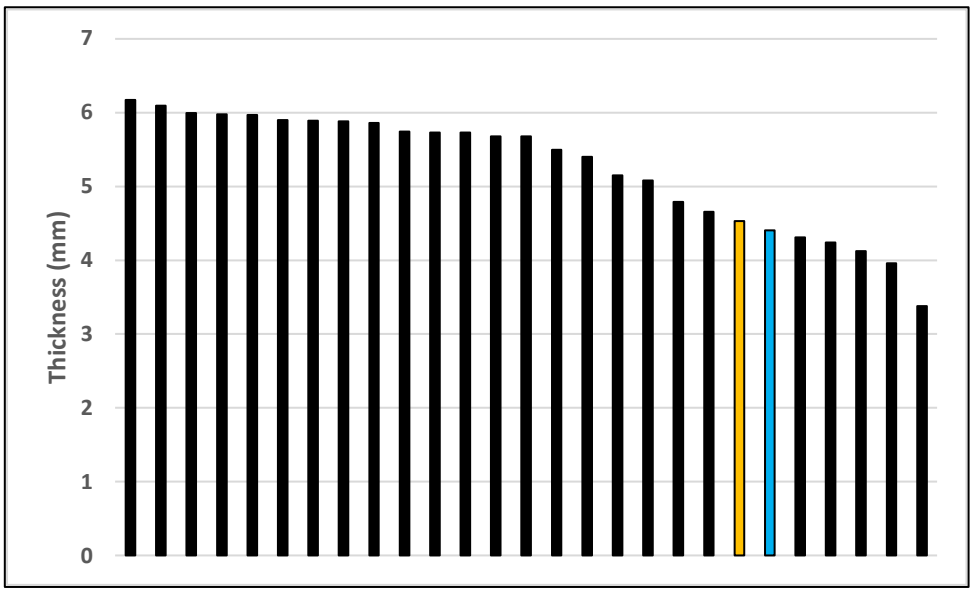

Figure 42: *Histogram showing the thickness of each measurable sherd arranged from largest to smallest. The orange bar is the rim sherd, the turquoise bar is the lug.*

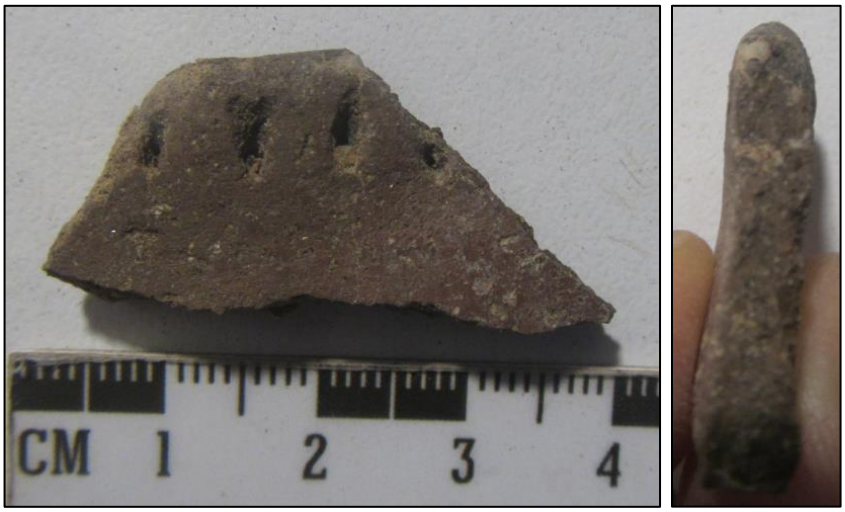

Figure 43: *The single decorated rim sherd from BW2009/003 showing the decoration (left) and rim form in cross-section (right).*

Figure 44: *The single lug from BW2009/003.*

Figure 45: *The single lug from BW2009/003.*

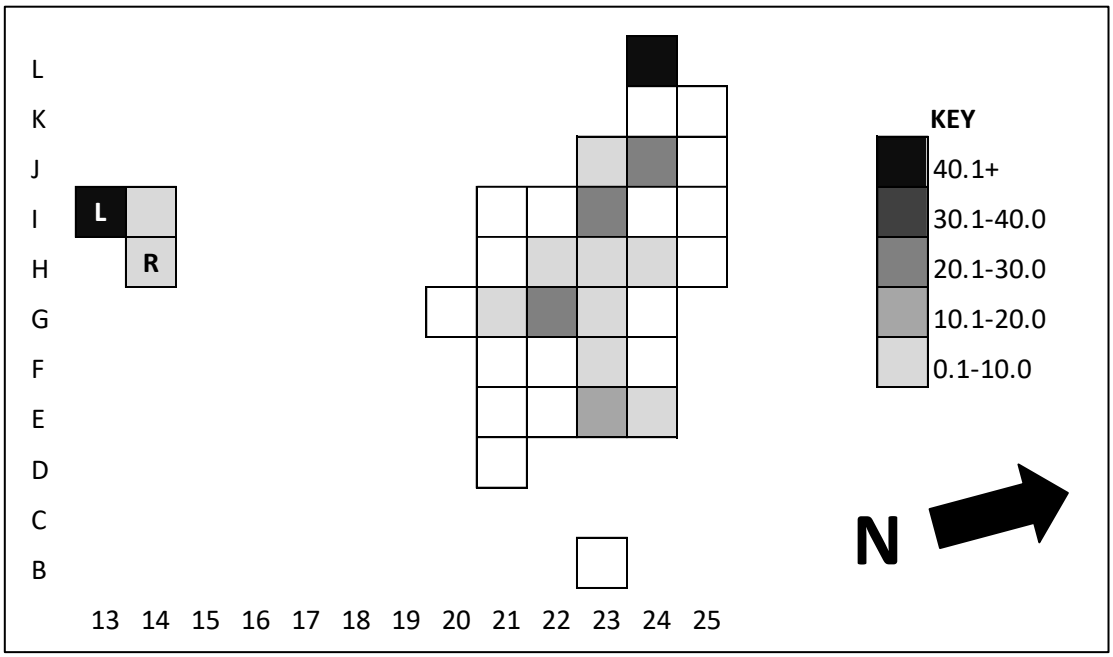

Figure 46: *Plan of BW2009/003 showing the distribution of pottery by weight. 'L' denotes the lug, 'R' denotes the rim.*

5.2.3. Discussion

This site does not have a nice floor surface and was likely only used as shelter from the wind. During one visit a small fire was made. The lack of general occupation debris such as stone artefacts, ostrich eggshell and bone fragments supports this. While a few artefacts may have resulted from late Holocene use of the shelter, the remainder are likely part of the background scatter of stone artefacts that can be found almost anywhere in this area. The origin of the pottery is unclear. Some may have been left when people used the site, other pieces may have come from behind the boulders, since two very large sherds were found deep in the shelter under a smaller boulder and close to the 'exit' out the back. This is in the direction of BW2009/004.

5.3. BW2009/004

This 'site' really just consisted of a light scatter of pottery between the various boulders (Figure 47) higher up the ridge from BW2009/003. Figure 48 shows the GPS points for the collection areas. None of these areas was flat and readily 'occupiable' as is evident from Figure 47. The entire scatter covered an area of 12 m north-south by 10 m west-east. Table 4 provides data about the site.

Figure 47: *View towards the southwest across the cluster of boulders amongst which the pottery scatter occurred. Four of the eight collection areas are indicated by their letters.*

Figure 48: *Aerial view of BW2009/004 showing the GPS-plotted collection areas (labelled A-G) and the original waypoint (red).*

Table 4: *Site data for BW2009/004.*

Site location:	S 28 04 50.6 E 17 07 20.2
Landscape position:	Among boulders at foot of mountain
Sampling methodology:	Surface collection with waypoints
Area sampled:	7 locations
Sieve mesh size:	n/a
Find categories:	Pottery, stone artefacts
Age of site:	LSA (<2000 BP), but with older BGS

5.3.1. Pottery

The seven collection locations produced a total of 24 pot sherds weighing 213.0 g. There were no features present but one sherd had curves suggesting it was part of the neck of the pot. The pottery tended to be red-brown and burnished on the outside (Figure 49) and, where it was not discoloured, brown on the inside (Figure 50). Some burnt areas were present on the outside showing that the pot was used on a fire. The sherd thickness ranged from 4.22 to 5.80 with an average thickness of 4.66 mm. The temper was a mixture of grains of igneous rocks, quartz and mica and some grains were very large. The largest grain was an igneous one measuring 6.6 mm in length. One sherd showed an elongated hollow which resulted from the accidental inclusion of a small stick in the clay. The stick burned up during firing leaving the cavity (Figure 51). Sherd preservation was very variable. Most was fairly well preserved but the pottery from collection area D was very friable and surface exfoliation from both the internal and external surfaces was common (Figure 52).

Figure 49: *Exterior surfaces of the pottery from collection area B.*

Figure 50: *Interior surfaces of the pottery from collection area B.*

Figure 51: *Potsherd from collection are G showing the cavity left from the burning of a stick in the clay during firing.*

Figure 52: *Pottery from collection area D was very friable due to being heavily weathered.*

5.3.2. Stone

Just two flaked stone artefacts were seen among the boulders at BW2009/004. These were a quartzite irregular core with surface weathering suggesting it to date from the MSA (Figure 53) and a quartz single platform core that seems fresh and likely dates to the LSA. The latter was made by striking the top off the pebble and then using the surface as a striking platform to produce flakes (Figure 54). Both of these artefacts are likely part of the broader BGS in the area.

Figure 53: *Weathered quartzite irregular core from collection area A.*

Figure 54: *An unweathered quartz single platform core from collection area E.*

Associated with collection areas F and G were a series of large quartz crystals, all with one end missing. There were four at 'F', three of them with ends that appear to have been deliberately struck off. The fourth one and the single crystal collected at 'G' do not seem flaked but may be naturally broken.

Figure 55: *The four quartz crystals from collection area F with missing ends at the top. The one on the right does not appear to be flaked.*

5.3.3. Discussion

This archaeological site is a very ephemeral occurrence. It is hard to know for certain what it represents. It may even have been a spot where a pot containing the crystals was hidden/stored and then forgotten and broken up over time. However, it seems very unlikely that the pot sherds would have spread so widely in such a circumstance. There does not seem to be any evidence of an 'occupation' of any sort but nevertheless someone must have visited the spot to leave the pottery and quartz crystals.

5.4. BW2009/005

This is the third site in the cluster of three located on the lower end of a granite ridge. It is the lowest and northernmost of the three. It was formally excavated on the same grid as BW2009/003 (Figure 35). Figure 56 shows a view of the excavation area, while Figure 37 shows the wider context and relationship to the other two sites. The site lies at the northern toe of the ridge on a small platform surrounded by boulders and can be regarded as north-facing. Site excavation data are provided in Table 5. On commencing excavation it was found that there was only a very thin layer of unconsolidated sand and gravel and that this contained the archaeological material. Although the deeper, consolidated gravel was checked at first, most of the site was excavated by simply brushing up the loose surface sand and gravel. Excavation aimed to collect all visible sherds of pottery.

Table 5: *Site data for BW2009/005.*

Site location:	S 28 04 49.5 E 17 07 20.7
Landscape position:	Among boulders at foot of mountain
Sampling methodology:	Formal grid excavation
Area sampled:	19 m^2
Sieve mesh size:	3 mm
Find categories:	Pottery, stone artefacts
Age of site:	LSA (<2000 BP), but with older BGS

Figure 56: *View towards the southwest across the area where the pot sherds were scattered. The main grid was in the clear area in the foreground, while square R41 was behind the small boulder at the back (arrowed).*

5.4.1. Pottery

Sixty-three pot sherds weighing 107.0 g were recovered. The outside of the sherds tended to be red-brown to dark brown, while the inner surfaces were brown. There were no features present, but, from its curvature, one of the sherds was from the neck region of a pot. The temper was a mixture of grains of igneous rocks, quartz and mica. The thickness varied from 4.04 to 6.27 but many sherds were very slightly weathered, especially on their inner surfaces (Figure 57), so these values may be slightly too low. The mean thickness for the scatter was 4.86 mm. It should be noted that the neck sherd was 6.27 mm thick and that the next thickest sherd was 5.78 mm. Overall examination suggests that there may be sherds from two different pots represented. Figure 58 shows the distribution of the pottery by weight.

Figure 57: *Pottery from square R41. Three refitting sherds are shown with their outer surfaces face-up, while the other four are showing their inner surfaces.*

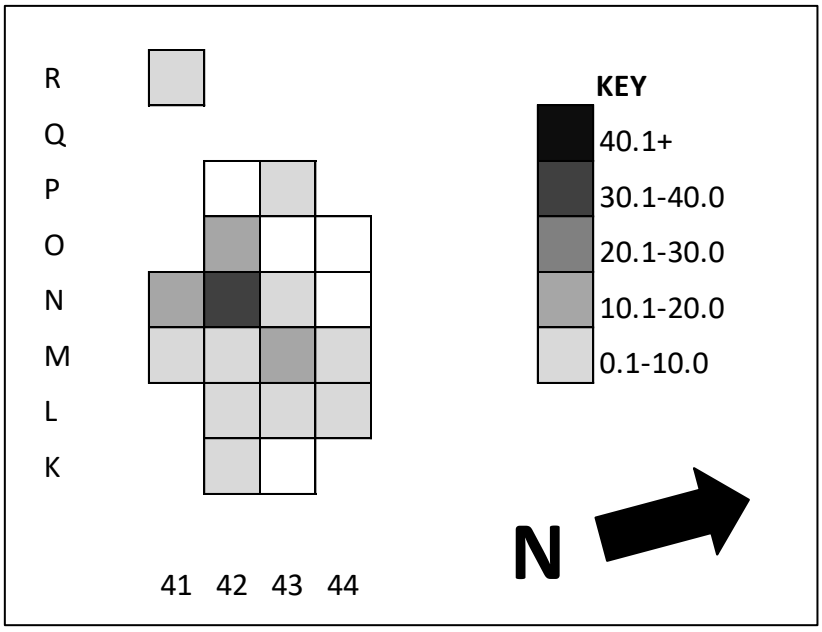

Figure 58: *Plan of BW2009/003 showing the distribution of pottery by weight.*

5.4.2. Stone artefacts

Just two stone artefacts were found. One was a quartzite flake whose weathered surfaces clearly showed it to be fairly old, presumably dating to the MSA and part of the regional BGS. The other was a small quartzite chunk that was unweathered and must date to the LSA. Whether the latter was even flaked was not certain.

5.5. BW2009/017

This site lay on a gently sloping area between an erosion gully and a low ridge of small granite boulders (Figure 59). The stone artefacts lay between numerous natural rocks and rock fragments that have no doubt been moving downslope slowly through natural weathering and erosion (Figures 60 & 61). Although sieving was employed at first, it soon became evident that the artefacts were all lying on the surface amongst the gravel and rocks and the excavation methodology switched to simply collecting all visible materials from the surface. Table 6 provides excavation details and Figure 62 a plan of the excavation area.

Figure 59: *View towards the northeast across BW2009/017 with the erosion gully in the foreground. The scatter lay between the gully and larger rocks in the background. The scale bar (faintly visible in mid-picture) is 0.5 m long.*

Table 6: *Site data for BW2009/017.*

Site location:	S 28 04 13.3 E 17 06 48.8
Landscape position:	At foot of mountain
Sampling methodology:	Formal grid excavation & surface collection within grid
Area sampled:	20 m^2
Sieve mesh size:	3 mm
Find categories:	Stone artefacts
Age of site:	MSA

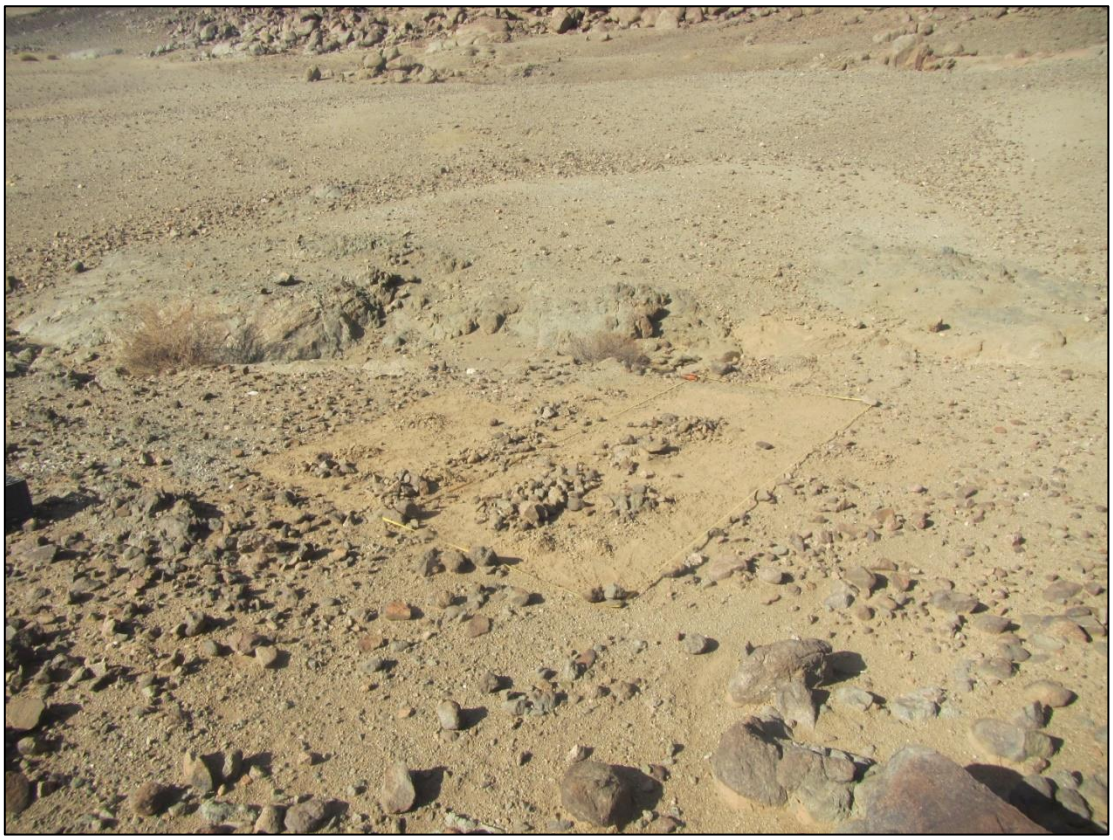

Figure 60: *View towards the southeast across BW2009/017 after excavation. The larger non-artefactual rocks remain within the excavation area.*

Figure 61: *View of the surface of the site showing the natural rocks interspersed with a low density artefact scatter. The scale bar is 0.5 m long.*

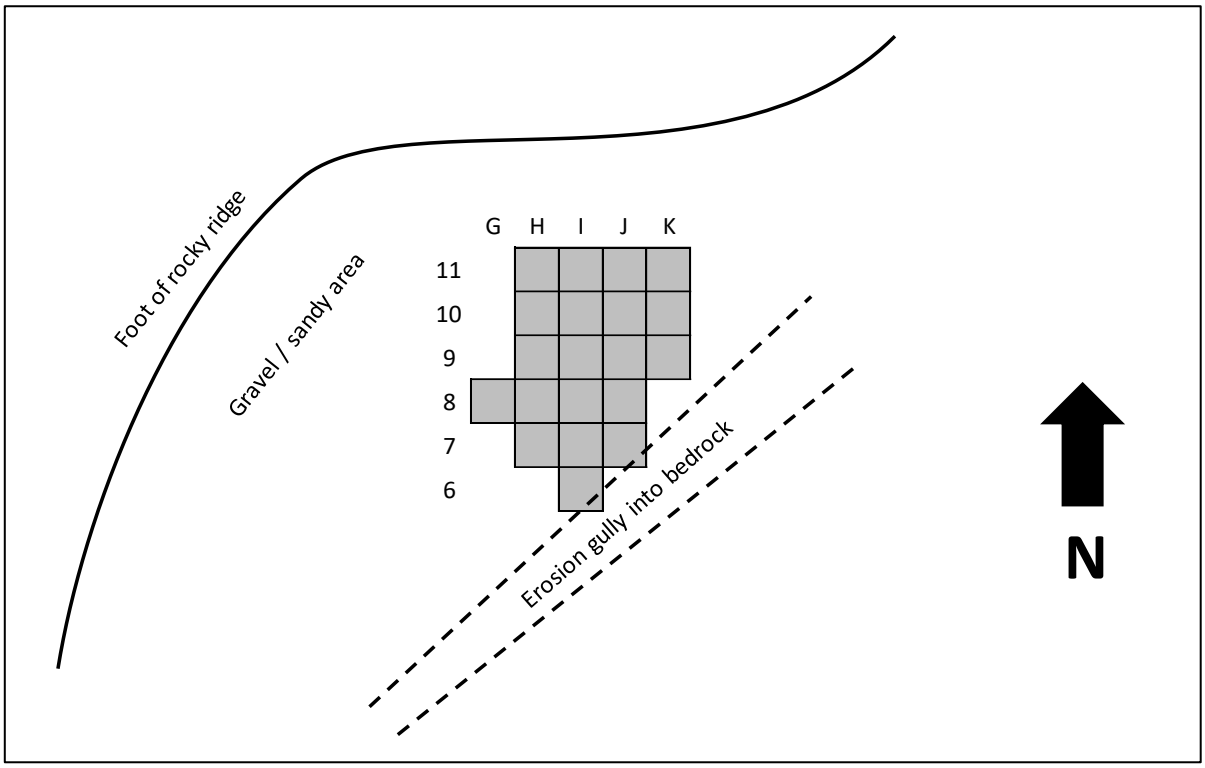

Figure 62: *Plan of the excavation grid at BW2009/017 relative to the erosion gully and the low granite ridge.*

5.5.1. Stone artefacts

The only category of archaeological material present at this site was stone artefacts. A small assemblage of 64 flaked artefacts was recovered (Table 7). The collection was dominated by quartz with quartzite the only other material present. Diagnostic elements were absent, although the quartzite irregular core looked as though it may once have been a radial core that broke and was then flaked further. Radial cores are most likely to be MSA. This artefact was also quite weathered suggesting a relatively great age. The quartzite retouched flake is similarly weathered and assumed to be MSA in age (Figure 63). Quartz does not weather as quickly as quartzite and the absence of weathering on the quartz pieces is not informative. The quartz irregular core was a large block with flakes removed from several places (Figure 64). It is very likely that all (or the vast majority of) these artefacts date from the MSA. Figure 65 shows the distribution of stone artefacts across the sampled area. The numbers per square are too small to detect clear spatial patterning.

Table 7: *Stone artefacts from BW2009/017.*

Type	**Quartz**	**Quartzite**
Single platform core	1	-
Irregular core	3	1
Retouched blade	1	-
Retouched flake	-	1
Flake	27	2
Chunk	27	1
Total	59	5

Figure 63: *Quartzite retouched flake from square H7.*

Figure 64: *Quartz irregular core from square H7.*

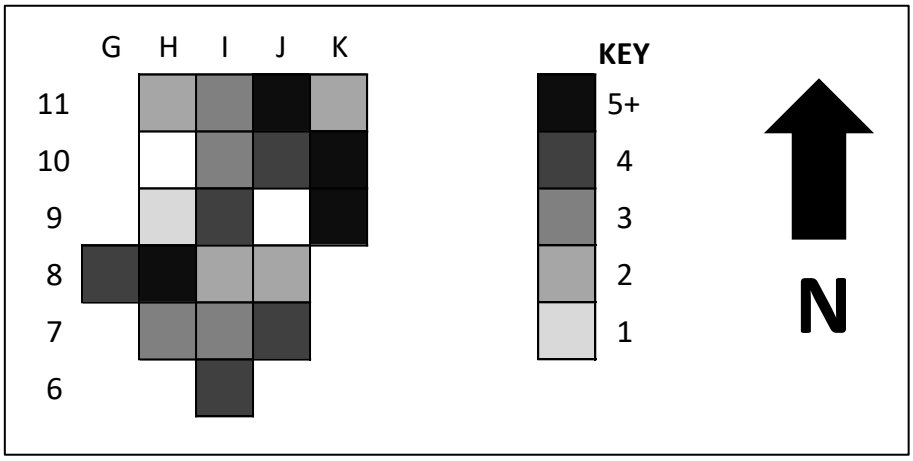

Figure 65: *Plan of BW2009/017 showing the distribution of stone artefacts by number.*

5.5.2. Discussion

This site is a patch of MSA artefacts that likely represents a place where people stayed for a short while. The scatter has been affected by natural forces over tens of thousands of years and some artefacts may even have been weathered to such a degree that they were not recognised during excavation, while smaller ones (flaking debris) have clearly been removed by erosion. The site is a small concentration of the kinds of artefacts that comprise the quartz-rich BGS in the wider area along the foot of the mountains.

5.6. BW2009/020

This site also appears to be a part of the general quartz-rich background scatter that occurs widely at the foot of the mountains. It was noted that the whole area had a very low density of quartz artefacts and that this location had a slightly greater density than elsewhere. The scatter was located on the gravel plain at the foot of the mountain (Figure 66) but there was an area of granite exposed a short distance towards the south. There was no deposit with the artefacts simply being included in the light gravel scatter that lay on top of a hard silt surface (Figures 67 & 68). Table 8 provides the excavation data for the site, while Figure 69 shows the excavation grid.

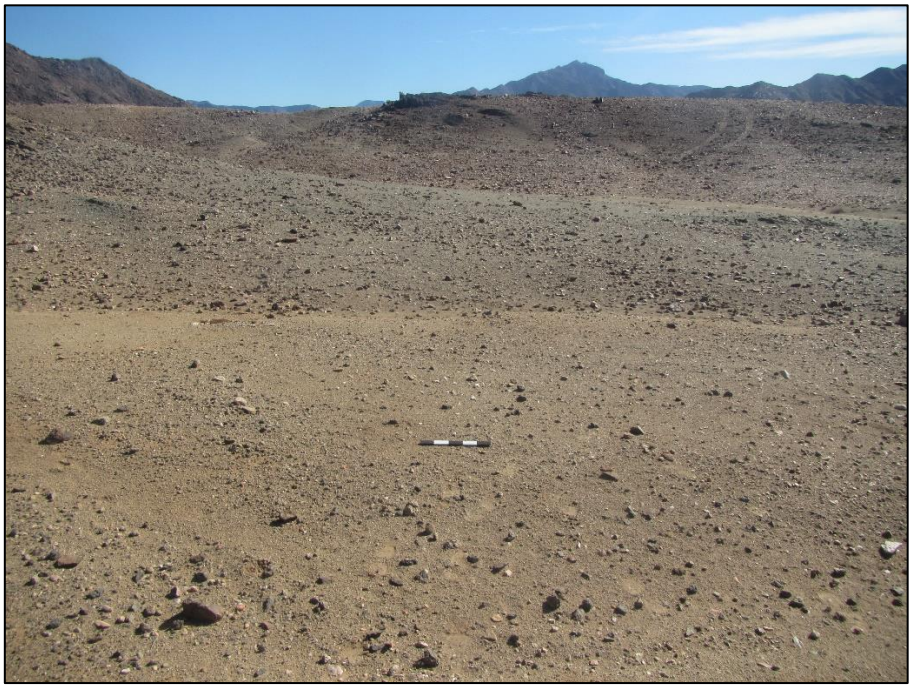

Figure 66: *View towards the north across the artefact scatter at BW2009/020. The mountain is towards the left and the river to the right and a granite outcrop occurs a short way to the south (behind the camera). The scale bar is 0.5 m.*

Figure 67: *View of the surface of BW2009/020 prior to excavation. Scale is 0.5 m.*

Figure 68: *View towards the north at the end of excavation.*

Table 8: *Site data for BW2009/020.*

Site location:	S 28 04 07.7 E 17 06 48.10
Landscape position:	On the plain at foot of mountain
Sampling methodology:	Formal grid excavation
Area sampled:	17 m^2
Sieve mesh size:	3 mm
Find categories:	Stone artefacts
Age of site:	MSA

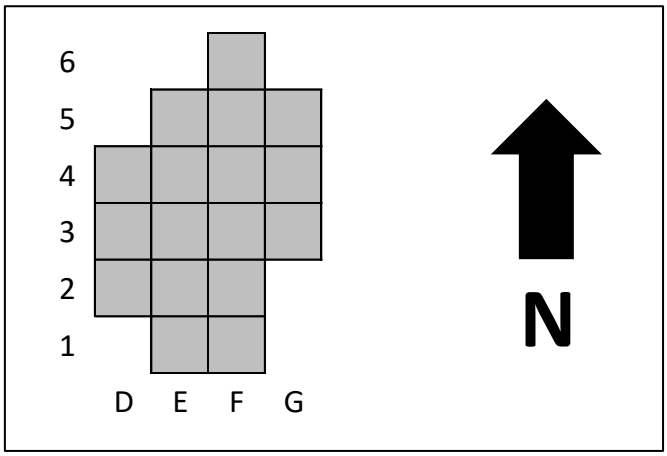

Figure 69: *Plan of the excavation grid at BW2009/020.*

5.6.1. Stone artefacts

A small assemblage of 61 flaked stone artefacts was recovered from this scatter (Table 9). It was fairly similar in character to the BW2009/017 assemblage except that other stone materials were included – sandstone and 'other'. One of the latter was a fine-grained sedimentary rock formed into a pebble with the flake retaining some pebble cortex (Figure 70), while the other was indeterminate but perhaps a very heavily weathered hornfels (Figure 71). Two unusual artefacts were found. A single platform blade core in quartz is an elongated artefact with several scars, at least one of which is of blade dimensions (i.e. >25 mm long; Figure 72). The other was an artefact with two wide opposing 'notches' retouched into one end (Figure 73). Interestingly, the piece was not a flake but the side that was 'ventral-like' had a natural facet and a negative scar (the 'notches' were flaked from this side), while the 'dorsal-like' side was entirely natural. Figure 74 shows the spatial distribution of the artefacts. The square with a high number of artefacts appears to be the location where artefacts were photographed in 2009 and does not represent a real pattern.

Table 9: *Stone artefacts from BW2009/020.*

Type	**Quartz**	**Quartzite**	**Sandstone**	**Other**
Single platform blade core	1	-	-	-
Irregular core	-	-	-	1
Retouched piece	1	-	-	-
Flake	31	4	-	1
Chunk	18	1	1	-
Chip	2	-	-	-
Total	53	5	12	2

Figure 70: *The 'other' cortical flake from BW2009/020.*

Figure 71: *Both sides of the 'other' irregular core from BW2009/020.*

Figure 72: *Both sides of the single platform blade core flake from BW2009/020. It was struck from the top in this view.*

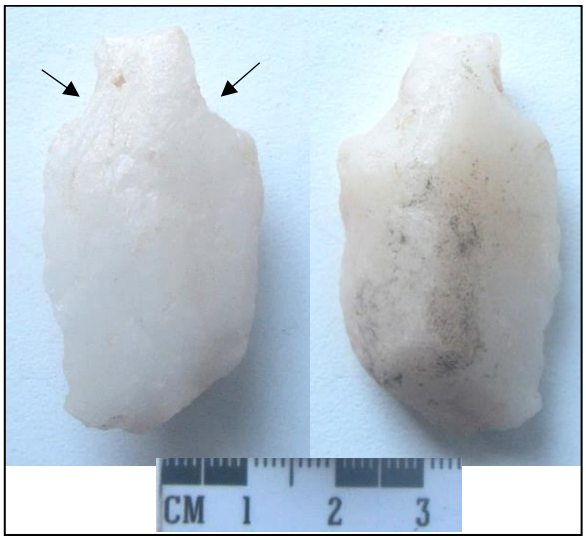

Figure 73: *Both sides of the retouched piece flake from BW2009/020. The two notches are arrowed on the 'ventral-like' side of the artefact.*

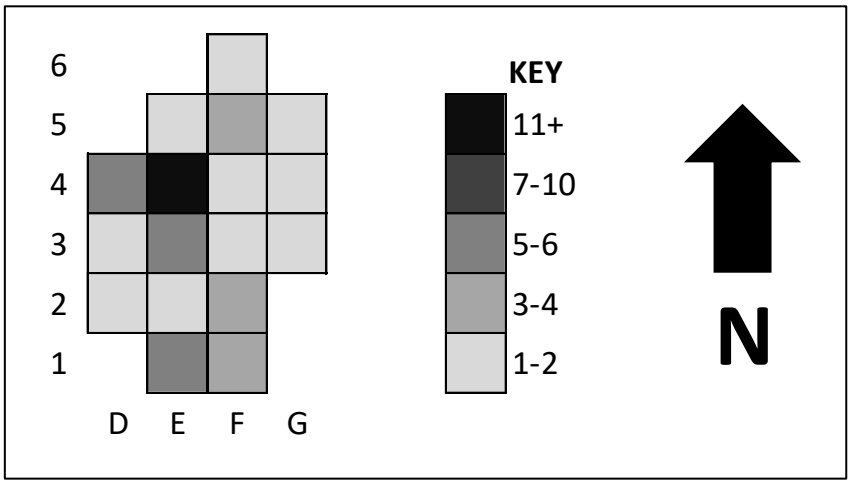

Figure 74: *Plan of BW2009/020 showing the distribution of stone artefacts by number.*

5.6.2. Discussion

Like BW2009/017, this site seems to represent an area with a concentration of artefacts that might otherwise be attributable to BGS. The Phase 1 assessment had considered this site to be LSA but, while there were no obvious technological indicators of the artefacts being MSA, their general condition and context support this older age.

5.7. BW2009/022

This site was a scatter of artefacts in a gravel area perched on an elevated platform at the foot of the mountain on the south-eastern margin of a large tributary river valley (Figure 75). Quartz artefacts attributable to BGS were observed widely in the area but the density at this location was far higher than in the surrounding areas. There was no deposit with the artefacts simply being included in the gravel scatter that lay on top of a hard silt surface (Figures 76 & 77). Table 10 provides the excavation data for the site, while Figure 78 shows the excavation grid.

Figure 75: *View towards the northwest with the dense artefact scatter located just left of the bedrock outcrop in mid-picture.*

Figure 76: *View of the surface of BW2009/022 showing the artefacts and gravel. The scale bar is 0.5 m.*

Figure 77: *View towards the northwest at the end of excavation of BW2009/022.*

Table 10: *Site data for BW2009/022.*

Site location:	S 28 04 01.5 E 17 06 42.3
Landscape position:	At foot of mountain
Sampling methodology:	Formal grid excavation
Area sampled:	7 m^2
Sieve mesh size:	3 mm
Find categories:	Stone artefacts
Age of site:	MSA

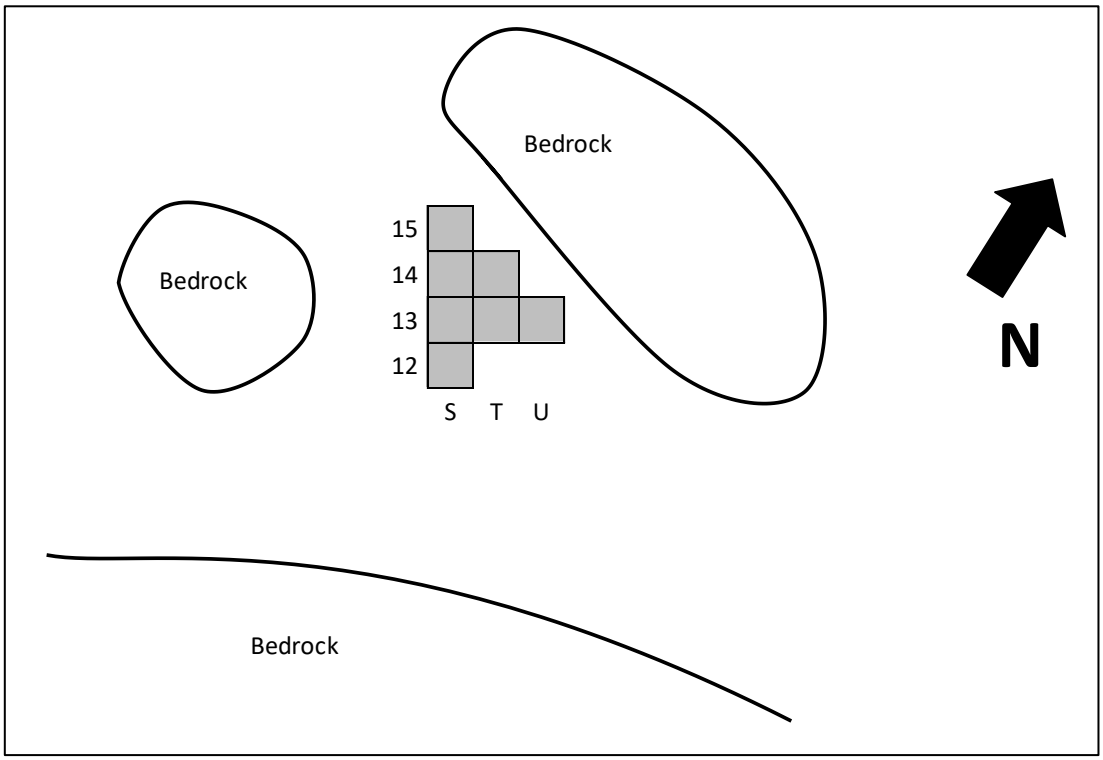

Figure 78: *Plan of the excavation grid at BW2009/022.*

5.7.1. Stone artefacts

The excavation recovered 184 flaked stone artefacts (Table 11). The majority (85.3%) were in quartz with quartzite, CCS and 'other' accounting for the rest. The artefacts were quite informal and often quite chunky with very few well-formed flakes (Figure 79). Several bipolar cores were found but these, too, were generally not typical in form. They were identifiable by removals on one or both faces but from both ends and/or crushing on the ends and/or their overall shape. Only two (Figure 80) had the characteristic shape that allowed easy identification of the horizontal upper and angled lower striking platforms. Others were far less formal (Figure 81) and sometimes just less flaked (Figure 82 to 83). A number of artefacts had damaged edges that may have resulted from use or perhaps simply from post-depositional damage (e.g. animals walking over the site with their hooves crushing stones together). Two retouched items were found. One was a flake with an approximately 2 cm long curved edge with retouch, while the other was an artefact too broken to classify beyond a chunk with a notch retouched into one edge (Figure 84). Some variable weathering was noted indicating the inclusion of materials of different age. There were no obvious concentrations of artefacts (Figure 85) but, in any case, the entire patch was so small that if more had been excavated it would have had a concentrated area in the centre.

Table 11: *Stone artefacts from BW2009/022.*

Type	**Quartz**	**Quartzite**	**CCS**	**Other**
Bipolar core	6	-	1	-
Single platform blade core	1	-	-	-
Irregular core	5	-	-	-
Retouched flake	1	-	-	-
Notched chunk	1	-	-	-
Edge-damaged flake	7	-	-	-
Edge-damaged chunk	4	-	-	-
Flake	81	18	2	2
Chunk	51	1	3	-
Chip	-	-	-	-
Total	157	19	6	2

Figure 79: *The stone artefacts from BW2009/022, square S15.*

Figure 80: *Two quartz bipolar cores from square S13.*

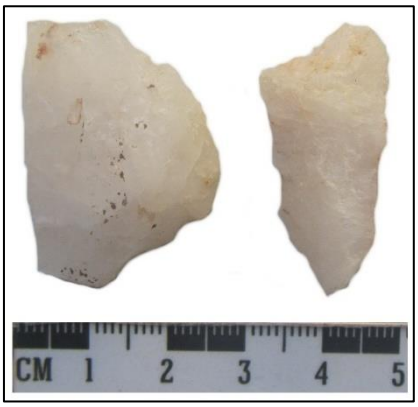

Figure 81: *Two quartz bipolar cores from square S15.*

Figure 82: *Both faces of a CCS bipolar core made on a pebble from square T13.*

Figure 83: *Both faces of a quartz bipolar core made on a small block from square U13.*

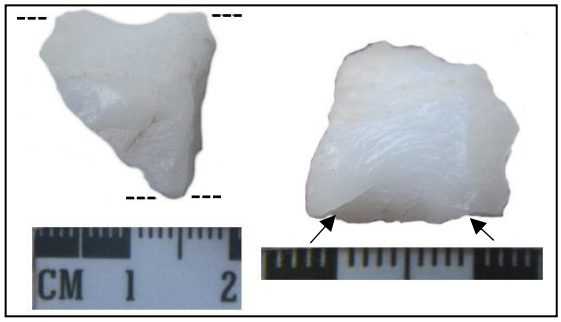

Figure 84: *The quartz notched chunk from square S13. Left view is in plan with the dotted lines showing the breaks. The right view is facing the notch (between the arrows).*

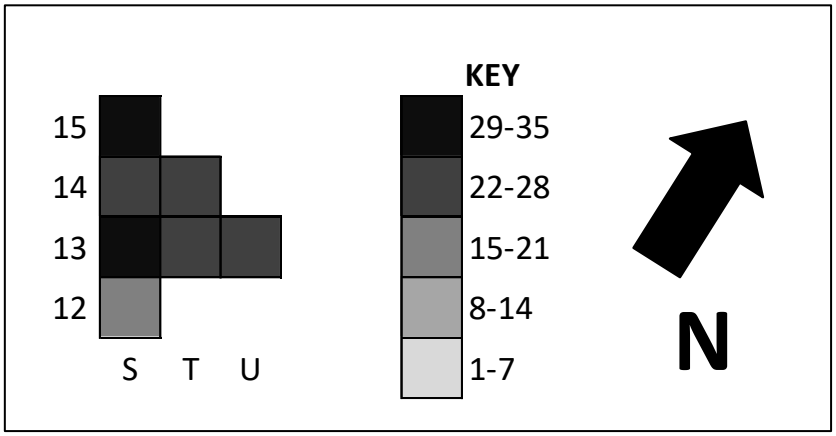

Figure 85: *Plan of BW2009/022 showing the distribution of stone artefacts by number.*

5.7.2. Discussion

This site represents a palimpsest but with all the artefacts likely to be from the MSA. Once more, the artefacts are similar to, and indeed part of, the wider BGS in the area. The location offers a good view of the surroundings and may have been repeatedly used as a campsite to spot game in the landscape. This would have led to a far higher density of artefacts in this location.

5.8. BW2009/031

BW2009/031 lay on the floodplain at the foot of the mountain (Figures 86 & 87). It is not considered an occupation site because the obviously mixed age material suggests that it is better thought of as a dense area of BGS. The artefacts were on the surface amongst low density gravel. On sieving the first few squares it was clear that there was nothing subsurface. For the remainder, the surface was brushed to allow all artefacts to be hand-picked from the squares without sieving the gravel. The densest area was targeted at first, and then subsequent squares were sampled based on the visible presence of artefacts. Figure 88 shows the excavation grid and Table 12 provides details of the excavation.

Figure 86: *View towards the south across BW2009/031 with the scatter between the viewer and the boulders.*

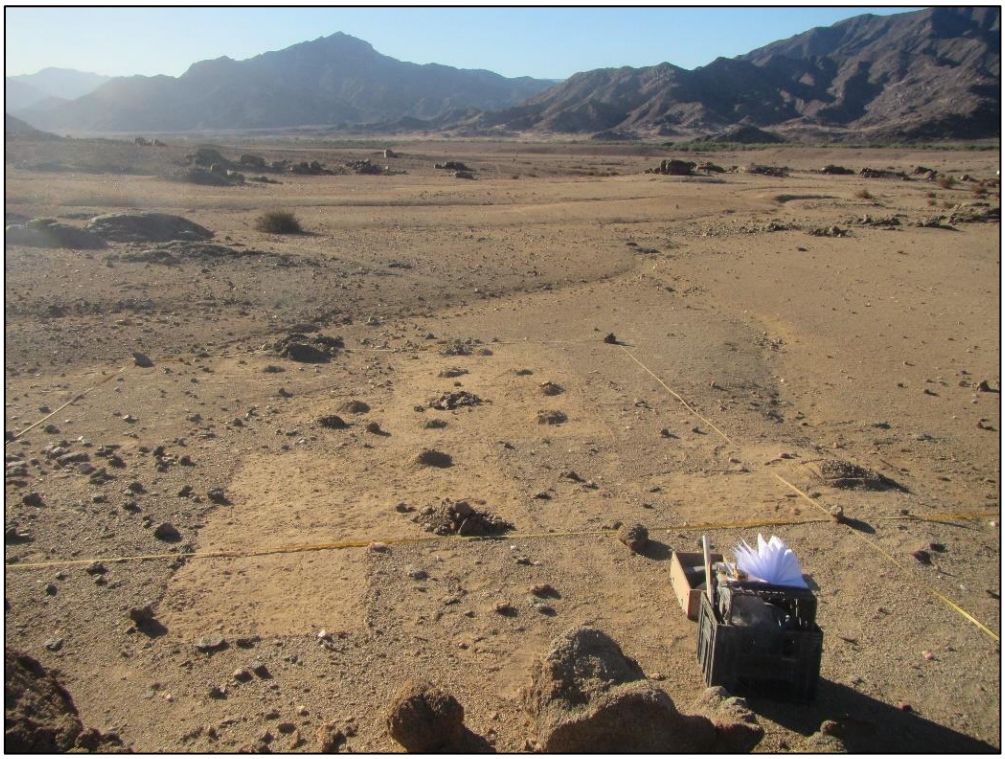

Figure 87: *View towards the northeast over the site at the end of excavation. Square M42 lies out of view to the right.*

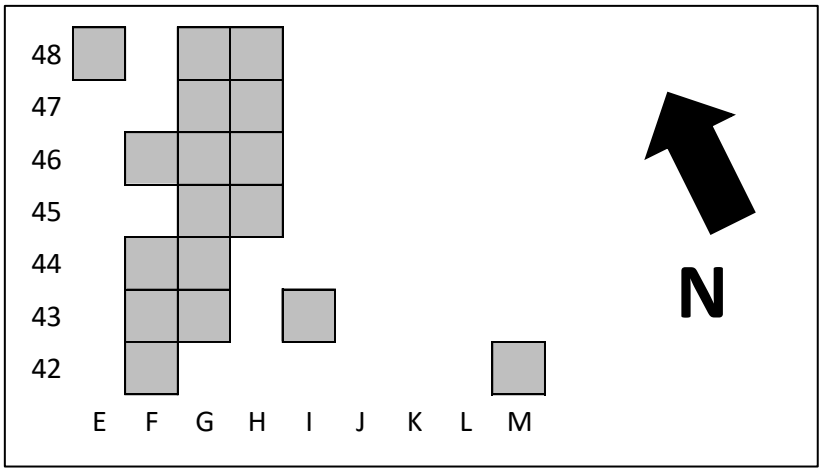

Figure 88: *Plan of the excavation grid at BW2009/031.*

Table 12: *Site data for BW2009/031.*

Site location:	S 28 03 53.9 E 17 06 27.0
Landscape position:	At foot of mountain
Sampling methodology:	Formal grid excavation
Area sampled:	17 m^2
Sieve mesh size:	3 mm
Find categories:	Stone artefacts
Age of site:	ESA, MSA

5.8.1. Stone artefacts

A mixed assemblage of 111 ESA and MSA stone artefacts was recovered from this scatter – the vast majority are MSA (Table 13). It was dominated by quartz artefacts (64.9%) but with quartzite also being a significant component (27.9%). The remaining artefacts were of CCS and 'other'. The latter included flakes in quartz porphyry, fine-grained granite, another igneous rock and probable banded iron formation (BIF). Two quartzite LCTs (classifiable as handaxes) were found (Figures 89 & 90). These indicate an ESA component but are no doubt simply part of the broader background scatter. Their dimensions are provided in Table 14. Although one is far more elongated than the other, their width to thickness ratios are very similar. These artefacts are characteristic of the Acheulean period of the ESA.

Table 13: *Stone artefacts from BW2009/031.*

Type	**Quartz**	**Quartzite**	**CCS**	**Other**
Bipolar core	1	-	-	-
Radial core	-	2	-	-
Single platform core	1	-	-	2
Irregular core	3	-	1	-
Retouched flake	2	1	-	-
Handaxe	-	2	-	-
Edge-damaged flake	2	-	-	-
Edge-damaged chunk	-	-	-	-
Blade	-	1	-	-
Flake	40	18	1	4
Chunk	19	7	-	-
Chip	4	-	-	-
Total	72	31	2	6

Figure 89: *A quartzite handaxe from square F43.*

Figure 90: *A quartzite handaxe from square M42.*

Table 14: *Handaxe dimensions in mm.*

Square	F43	M42
Maximum length	115.1	152.9
Maximum width	79.4	88.2
Maximum thickness	37.0	42.2
L:W ratio	1.45	1.73
L:T ratio	3.11	3.62
W:T ratio	2.15	2.09

A number of cores were recovered. Radial cores (Figures 91 & 92) are fairly typical of MSA technology. One of the two found here was made on an older flake (Figure 91). A single platform core on quartz porphyry was also made on an older flake (Figure 93). Reuse of older artefacts is not uncommon and reflects the fact that the older artefact indicates that the stone material is suitable for flaking. A number of very characteristic MSA flakes were also noted. Three of these are illustrated in Figures 94 & 95. In particular, the triangular flakes are strongly characteristic of MSA technology, generally being produced from prepared cores. Figure 96 shows a density plot of the site. Bearing in mind that squares containing very few visible (or interesting-looking) artefacts were not sampled, it is evident that the density varies strongly across the area.

Figure 91: *A quartzite radial core made on an older flake. The striking platform of the flake is arrowed.*

Figure 92: *A quartzite radial core from square F42.*

Figure 93: *A quartz porphyry flake demonstrating reuse as a single platform core in later times. The fresh removals are arrowed.*

Figure 94: *Ventral (above) and dorsal (below) surfaces of two typical MSA flakes.*

Figure 95: *A typical MSA quartzite blade.*

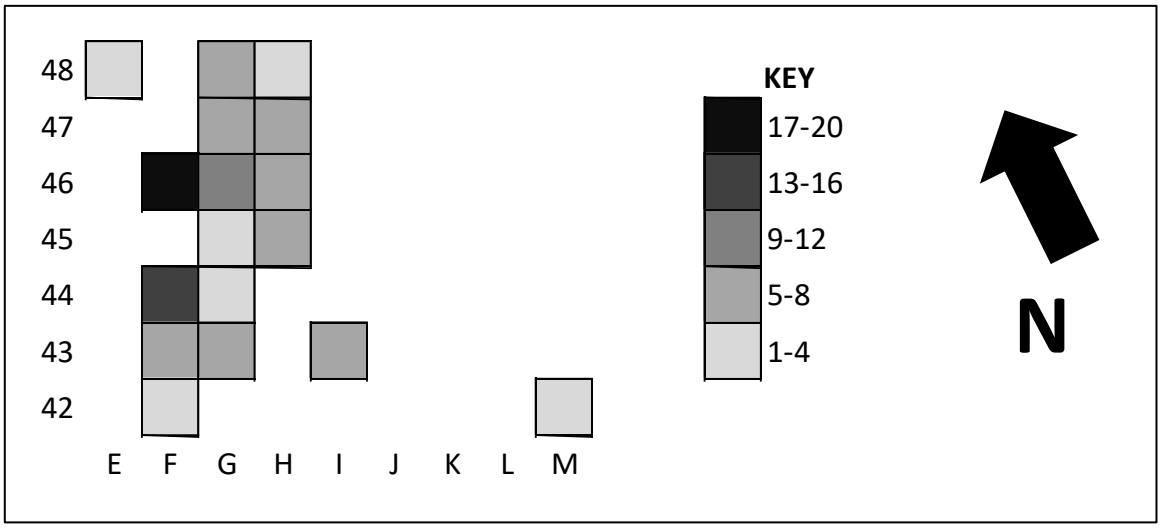

Figure 96: *Plan of BW2009/022 showing the distribution of stone artefacts by number.*

5.8.2. Discussion

This 'site' represents a denser area of BGS and thus provides a representative sample of the kind of materials seen in the wider area. It is a palimpsest of ESA and MSA materials. The dominance of MSA artefacts likely suggests that the MSA is more frequently represented on the wider landscape as well.

5.9. BW2009/044

BW2009/044 is not a site but rather a patch of denser artefacts within the general scatter that coats the cobble terraces of the area (Figures 97 & 98). The cobbles were a rich source of materials for flaking and as a result a wide variety of archaeological stone artefacts can be found on these terraces. Of course, much material would also have been removed and taken to sites elsewhere. Because of the low density of scatter and the obvious lack of *in situ* occupation debris, the artefacts were collected in 2 m by 2 m squares. They were simply collected from between the cobbles on the surface. In addition to this collection, a quick collection of artefacts was also made from the surrounding area within a few meters of the grid (approximately another 200 m^2). A single bifacial stone artefact was also collected from about 170 m to the northwest of the grid and bagged separately (location = Waypoint 787: S 28 04 04.9 E 17 07 01.0). Figure 99 shows a site plan and Table 15 provides excavation data.

Figure 97: *View towards the northwest across the BW2009/044 scatter.*

Figure 98: *View of the surface of the BW2009/044 scatter.*

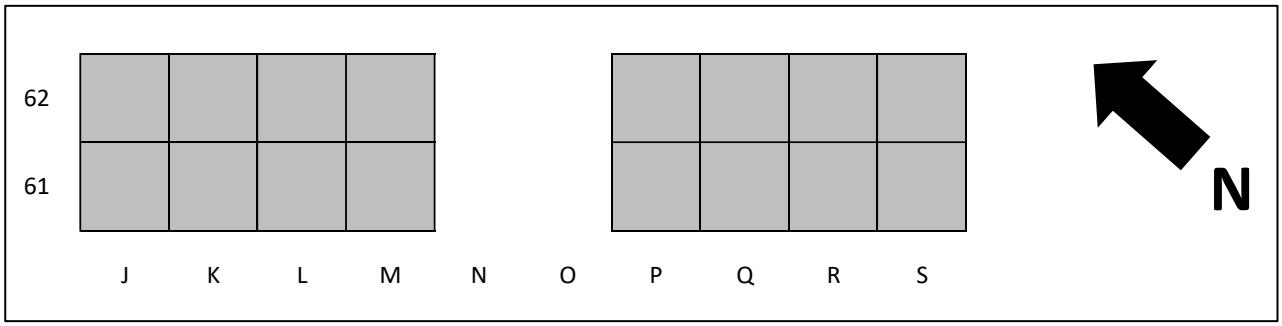

Figure 99: *Plan of the excavation grid at BW2009/044 (note that grid is in 2x2 m squares).*

Table 15: *Site data for BW2009/044.*

Site location:	S 28 04 07.4 E 17 07 03.2
Landscape position:	Cobble terrace
Sampling methodology:	Surface collection within grid & surface collection
Area sampled:	64 m^2 (in 4 m^2 squares) + *c.* 200 m^2
Sieve mesh size:	n/a
Find categories:	Stone artefacts
Age of site:	ESA, MSA, LSA

5.9.1. Stone artefacts

A small but interesting collection of 161 stone artefacts was recovered (Table 16). The formal sampling produced 130 artefacts and another 31 were collected from the surrounding area. The collection was strongly dominated by quartzite, although it was evident that comprehensive collection in the grid resulted in a higher frequency of quartz artefacts being collected there than in the general surface collection (Table 17). There were also many different colours and textures of quartzite present. Because cortical pieces were found to be very common, the presence of cortex was specifically recorded. In all but one instance where outcrop cortex was seen, the cortex was from river cobbles and pebbles (Figure 100). The high frequency of cobble cortex is because people were using the cobble terrace as a source of stone for making stone tools. River cobbles are well-known to be tough and resilient (the reason they have survived their journey downstream) and it is this property that made them suitable for flaking. Quartz was generally poorly represented and also has far fewer cortical pieces. This is likely because quartz was abundantly available in the local landscape, far more so than on the cobble terrace.

Table 16: *Stone artefacts from BW2009/044. All cortex is cobble cortex except where indicated.*

Type	**Quartz**		**Quartzite**		**CCS**		**Other**	
Cortex	**Y**	**N**	**Y**	**N**	**Y**	**N**	**Y**	**N**
Radial core	-	-	-	1	-	-	1	-
Single platform core	-	-	-	-	1	-	-	1
Irregular core	-	1	1	3	1	-	-	-
Unifacial point	-	-	-	2	-	-	-	-
Retouched flake	-	-	3	2	-	-	-	-
Notched flake	-	1	-	-	-	-	-	-
LCT	-	-	-	-	-	1	-	-
Edge-damaged blade	-	-	2	-	-	-	-	-
Edge-damaged flake	-	1	4	11	-	-	3	-
Edge-damaged chunk	-	-	-	-	1	-	-	-
Blade	-	-	1	2	-	-	-	-
Flake	2	10	35*	36	5	-	3	6
Chunk	-	2	9	8	-	-	-	-
Chip	-	1	-	-	-	-	-	-
Total	2	16	55	65	8	1	7	7

* One flake has outcrop cortex.

Table 17: *Stone material frequencies.*

Material	**Grid collection**	**Surface collection**
Quartz	12.3	6.5
Quartzite	70.8	90.3
CCS	6.2	3.2
Other	10.8	0

Figure 100: *Eight cortical stone artefacts from BW2009/044 square L62. The artefacts are all placed with their cortical surfaces towards the right.*

Bipolar cores were found to be absent. Such cores are generally favoured for the working of small nodules of stone. The river cobbles are large enough to be flaked using other methods of percussion and this is reflected in the presence of single platform cores (common on cobbles; Figure 101), irregular cores (Figure 102) and radial cores (a typical MSA technology; Figures 103-104). A tested cobble was also found (Figure 105). These are cobbles with only one or two flakes removed and were likely being tested for material quality, with some simply being discarded before being worked further.

Materials dating to the MSA were clearly dominant. One artefact was fairly confidently ascribed to the ESA based on its size and weathering state (Figure 106). It is an edge-damaged flake which has damage originating from multiple periods including scars with the same degree of weathering as the original flake. The later scars may be post-depositional damage or else later use – the former is perhaps more likely. A bifacially flaked artefact from Waypoint 787 was classified as an LCT although it is likely too small to be from the ESA when such artefacts were most often made. Instead it is likely to date to the MSA. Its dimensions are 80.5 x 46.0 x 26.8 mm but its width was difficult to measure due to its shape (Figure 107). A broken retouched quartzite flake was found. It had a wide notch retouched into one of its margins and minor trimming on the opposite one (Figure 108). Its distal end was missing. Two unifacial points in quartzite were also found (Figures 109-110). These are typical MSA artefacts. Both had their proximal tips missing. One had a faceted platform and was relatively lightly retouched, while the other had a flat cortical platform and was more heavily retouched.

Figure 111 shows the spatial density of artefacts. The most artefacts in a single square was 16, which translates to 4/m^2. The least dense squares had just 4 artefacts or 1/m^2. Although the plan suggests greater density in the northwest, the densities are so low as to make this 'concentration' meaningless.

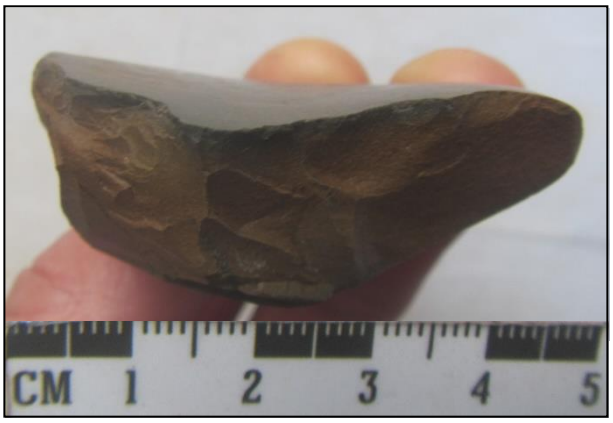

Figure 101: *A CCS single platform core made on a cobble from square R62.*

Figure 102: *A quartzite irregular core with younger scars (visible at the top) indicating two phases of use or later damage.*

Figure 103: *One face of the quartzite radial core from the surface collection.*

Figure 104: *The reverse face of the quartzite radial core from the surface collection.*

Figure 105: *A quartzite tested cobble from square Q62. Just one large flake has been removed from it.*

Figure 106: *A very large 'other' flake from square Q62 that is likely ESA in age. The inset shows the dorsal surface.*

Figure 107: *A CCS bifacially flaked artefact from Waypoint 787 to the north of the site.*

Figure 108: *A retouched flake from the surface collection.*

Figure 109: *The dorsal surfaces of two unifacial points from the surface collection. The left one is more heavily retouched.*

Figure 110: *The ventral surfaces of two unifacial points from the surface collection. The left one has a flat, cortical platform and the right a faceted platform.*

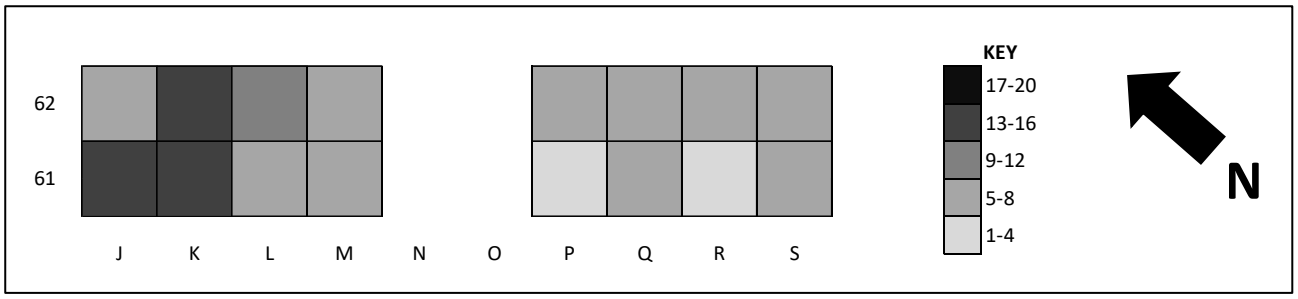

Figure 111: *Plan of BW2009/044 showing the distribution of stone artefacts by number.*

5.9.2. Discussion

This collection of artefacts presents an excellent example of the varied nature of artefacts seen on the cobble terraces during the Phase 1 survey. It is essentially BGS. It is dominated by quartzite – as are the cobbles – and this, together with the high number of cortical flakes, indicates that the terraces formed an important source of stone for flaking during the MSA. ESA hominins also seem to have made use of the terraces but there is little material evidence of LSA people using them.

5.10. BW2009/048

This scatter was located on one of the large cobble/gravel terraces (Figure 112). On arriving at this spot it was evident that the expected higher concentration of quartzite artefacts was not present. The reason for this remains unknown. Nevertheless, as is the case all over the cobble terraces of the area, artefacts were present. Because of the relatively low density, however, it was decided that formal sampling using a grid would be pointless. Instead, about twenty minutes was spent collecting every artefact that could be found in the vicinity of the waypoint. The GPS tracks from the work indicate that the area from which artefacts were collected in this manor was some 350 m^2 (Figure 113). Table 18 shows the site data.

Figure 112: *View towards the northeast across the terrace in the vicinity of BW2009/048.*

Figure 113: *Aerial view of the vicinity of BW2009/048 showing the GPS track created during the surface artefact collection.*

Table 18: *Site data for BW2009/048.*

Site location:	S 28 03 32.9 E 17 06 30.0
Landscape position:	Cobble terrace
Sampling methodology:	Surface collection
Area sampled:	*c.* 350 m^2
Sieve mesh size:	n/a
Find categories:	Stone artefacts
Age of site:	ESA, MSA, LSA

5.10.1. Stone artefacts

The area proved to have a very low density scatter of artefacts and just ten could be found (Table 19). One flake was very large and presumably dates from the ESA, another was a typical MSA flake with prominent Y-shaped dorsal ridges, while a third was very small and, given its preservation state, may be from the LSA (Figure 114). Half of the artefacts were cortical.

Table 19: *Stone artefacts from BW2009/048. All cortex is cobble cortex.*

Type	**Quartz**		**Quartzite**		**CCS**	
Cortex	**Y**	**N**	**Y**	**N**	**Y**	**N**
Irregular core	-	-	1	-	-	-
Flake	-	2	3	3	1	-
Total	-	2	4	3	1	-

Figure 114: *Three flakes thought to date to the ESA, MSA and LSA.*

5.10.2. Discussion

Little can be said of this small collection other than that it represents the BGS present across the cobble terraces of the area.

5.11. BW2009/049

This scatter was located on the same cobble/gravel terrace as BW2009/048 (Figure 115). This location also did not seem to have as many artefacts as were expected. Again it was decided that a formal collection within a grid would not be worthwhile because the density was too low. A collection was made from the surface with an area of approximately 1100 m^2 being covered in variable density in this way (Figure 116). Table 20 shows the site data.

Figure 115: *View towards the northeast across the vicinity of BW2009/049.*

Table 20: *Site data for BW2009/049.*

Site location:	S 28 03 28.4 E 17 06 28.5
Landscape position:	Cobble terrace
Sampling methodology:	Surface collection
Area sampled:	*c.* 1100 m^2
Sieve mesh size:	n/a
Find categories:	Stone artefacts
Age of site:	MSA

Figure 116: *Aerial view of the vicinity of BW2009/049 showing the GPS track created during the surface artefact collection.*

5.11.1. Stone artefacts

The surface collection at this part of the cobble terrace was more productive than at BW2009/044 yielding 42 artefacts, although from a larger area. Almost all were in quartzite and there was a high frequency of cortical artefacts. A few of these were outcrop cortex indicating a source on the mountain rather than on the cobble terrace. Two radial cores were present. One was an extensively worked core made on a cobble and flaked unifacially, while the other was made on what seemed to be a naturally split cobble and, although less extensively worked, was flaked bifacially (Figures 117 & 118). Three artefacts were considered to be retouched because the scars were sufficiently focused. Two were flakes, while the third was flaked but considered a chunk, since a large part of one of its surfaces was formed by a natural break with no ventral surface. Amongst the waste artefacts was a large quartz blade – this was, in fact, the only quartz artefact recovered from the scatter. All the finds appear to be from the MSA, although this can never be certain in such a context.

Table 21: *Stone artefacts from BW2009/044. All cortex is cobble cortex except where indicated.*

Type	Quartz		Quartzite	
Cortex	**Y**	**N**	**Y**	**N**
Radial core	-	-	-	1
Retouched flake	-	-	1	1
Retouched chunk	-	-	1	-
Edge-damaged flake	-	-	3	-
Edge-damaged chunk	-	-	1	-
Blade	-	1	-	-
Flake	-	-	18*	9
Chunk	-	-	4**	1
Chip	-	-	-	-
Total	-	1	28	12

* Two flakes have outcrop cortex.
** Two chunks have outcrop cortex.

Figure 117: *The main flaking faces of the two quartzite radial cores.*

Figure 118: *The reverse faces of the two quartzite radial cores.*

Figure 119: *Ventral surfaces of two retouched flakes (left & centre) and one surface of a retouched chunk (right) showing the retouch foci (bracketed).*

Figure 120: *Dorsal surfaces of the two retouched flakes (left & centre) and the reverse surface of the retouched chunk (right) showing the retouch foci (bracketed).*

Figure 121: *A large quartz blade showing the ventral (left) and dorsal (right) surfaces.*

5.11.2. Discussion

This scatter again represents the BGS that is spread across the cobble terraces of the study area. It seems to only represent the MSA which seems to be the dominant age of the material on the Blokwerf terrace.

5.12. SB2009/002

SB2009/002 was located in a rocky area alongside some boulders on the very outermost edge of the plains (i.e. close to the foot of the mountain). The surface had a light coating of sand which obscured the rocks but they can be seen protruding in Figure 122. The larger boulders of the area have tumbled down from the mountain. The archaeological materials were very fragmented and scattered among sand and gravel; sieving therefore had to be employed to recover them. The excavation targeted all squares with visible materials in them and, as such, is likely to have captured almost 100% of the scatter. Figure 124 shows the excavation grid and Table 22 provides details of the excavation.

Table 22: *Site data for SB2009/002.*

Site location:	S 28 02 38.4 E 17 04 30.4
Landscape position:	At foot of mountain
Sampling methodology:	Formal grid excavation
Area sampled:	31 m^2
Sieve mesh size:	3 mm
Find categories:	Stone artefacts, pottery, ostrich eggshell
Age of site:	LSA (<2000 BP), but with older BGS

Figure 122: *View towards the south over the scatter at SB2009/002. The scatter lay between the small and large boulder in the foreground.*

Figure 123: *View towards the west over SB2009/002 at the end of excavation.*

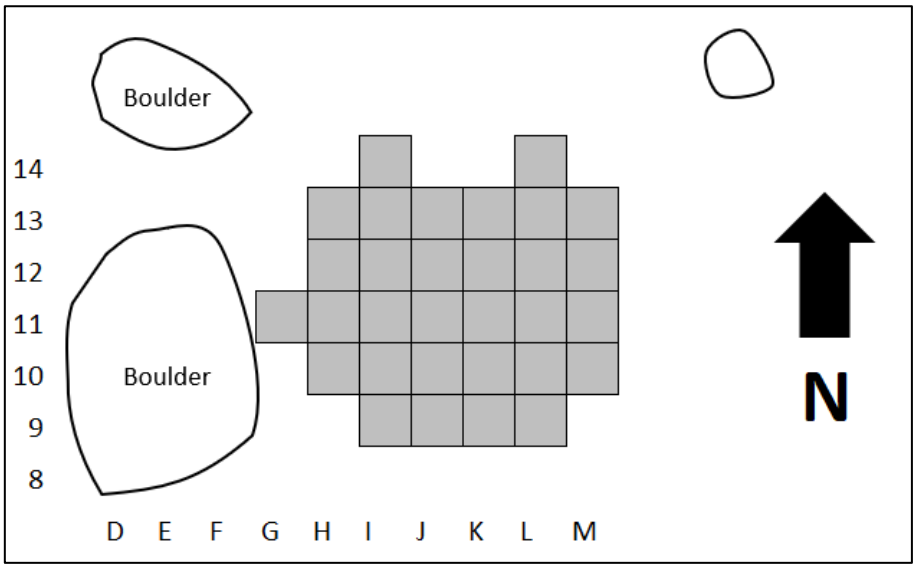

Figure 124: *Plan of the excavation grid at SB2009/002.*

5.12.1. Stone artefacts

This site did not have many stone artefacts (Table 23) and, because some of the quartz is weathered, it is likely that some or most of the flaked artefacts in fact pertain to BGS rather than to the LSA occupation of the site. None of the flaked artefacts was diagnostic. Some hammered and ground stone artefacts were present and certainly do relate to the LSA occupation (Figures 125-127). Two of them were on odd-shaped cobbles, one of them seeming like it was in fact broken long before being used. It is interesting that granite was chosen for these artefacts instead of the usual quartzite which is, of course, abundantly available on the nearby cobble terraces of the area. The hammerstone / lower grindstone was hammered all the way around its circumference giving it the appearance of a very large milled-edged pebble (Figure 127). Not listed in Table 23 is a broken ochre pebble from square H13. It weighed 31.4 g. It bore no signs of working but was a hard, good quality ochre that was almost certainly collected for use as a pigment (Figure 128). Figure 129 shows the distribution of the artefacts. While the flaked stones are fairly variably distributed, it is evident that the hammered and ground artefacts and the ochre were all found close to the boulder at the western edge of the excavation area.

Table 23: *Stone artefacts from BW2009/044. All cortex is cobble cortex except where indicated.*

	Quartz	Quartzite	Other	Sandstone	Granite
Irregular core	1	-	-	-	-
Flake	16	-	1	-	-
Chunk	6	1	-	-	-
Chip	2	-	-	-	-
Total	27	1	1		
Upper grindstone	-	-	-	1	-
Hammerstone / upper grindstone	-	-	-	-	1
Hammerstone / lower grindstone	-	-	-	-	1

Figure 125: *Upper grindstone from square G11. The ground surface is facing the viewer.*

Figure 126: *Upper grindstone from square H13. The ground surface is arrowed.*

Figure 127: *The lower grindstone / hammerstone from square I13. The ground surface is facing the viewer and the entire periphery is hammered.*

Figure 128: *The broken ochre pebble from square H13.*

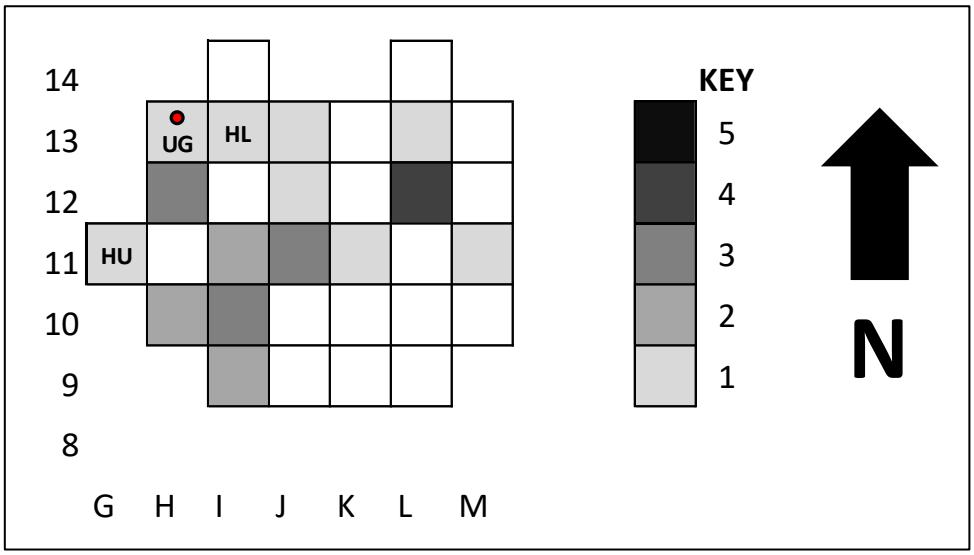

Figure 129: *Plan of SB2009/002 showing the distribution of stone artefacts by number.*

5.12.2. Pottery

The site produced 68 very small pot sherds weighing a total of just 56.7 g. The pottery is generally a red-brown colour on the outer surface with some sherds bearing a red burnish. The inner surfaces are variable browns. One sherd was darkened inside, presumably from use in a fire. As is evident from the photographs in Figures 130 to 134, the temper is variably fine- and coarser-grained. The largest grain seen was about 5 mm but in general the largest grains were closer to 3 mm in maximum dimension. The temper seems to be a mixture of igneous and quartz grains with some dominated by one or the other and some a more even mixture. Some sherds are quite weathered (Figure 132). This seems to be more the coarse-grained ones, but it might also be that the coarser grains just protrude and become more obvious in weathered sherds as the finer clay matrix weathers away. It is possible that two pots are represented, one with coarser temper than the other. Two small rim sherds were found (Figures 130, 131 & 133). Both have rim orientations classed as 'flared' and lip forms described as 'thickened round' and no doubt come from the same pot. Two sherds had a form suggestive of coming from the neck region of the pot. An interesting feature was a single sherd with 'drag lines' on its inner surface. These must have been made by something stuck under the fingers that were smoothing the inside of the pot during manufacture – perhaps even some mineral grains from the temper that came loose (Figure 134). The mean thickness of the sherds was 4.60 mm with a range extending from 3.51 mm to 5.85 mm. Figure 135 shows the spatial distribution of potsherds by weight. This shows that, while the densest squares were in the west in the lee of the large boulder, the very small sherds had become quite dispersed across the site.

5.12.3. Shell

One tiny shell thought to be *Corbicula fluminalis* (see Appleton 2002) was found in square L11. The shell was likely collected from the river and brought to the site as a curio. It was far too small to have served as food.

Figure 130: *I11 outer surfaces with a rim sherd on the left.*

Figure 131: *I11 inner surfaces with a rim sherd on the left.*

Figure 132: *Pot sherd from square I13 showing a weathered surface and coarse-grained temper.*

Figure 133: *A rim sherd from square K12.*

Figure 134: *The inner surface of a sherd from square M11 showing impressions in the clay made during smoothing.*

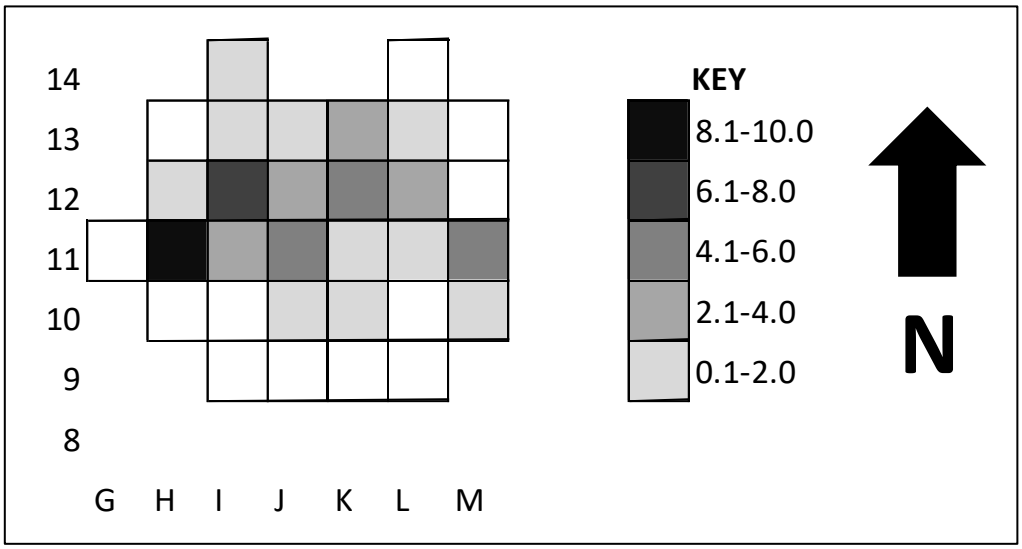

Figure 135: *Plan of SB2009/002 showing the distribution of pottery by weight (g).*

5.12.4. Ostrich eggshell

There were 54 fragments of ostrich eggshell. These were very highly fragmented with the total weight being just 16.1 g; this makes an average weight of just 0.3 g. One piece had a shallow, straight incision on it. Whether this was produced accidentally, perhaps through trampling, or was made by someone cannot be said with any certainty. It is thus not possible to pronounce on whether it is intentionally engraved. One fragment (from square I12) was burnt. Figure 137 shows a general concentration of ostrich eggshell in the central part of the site but a light scatter all across the excavated area.

Figure 136: *Ostrich eggshell fragment from square J12 with an incised line.*

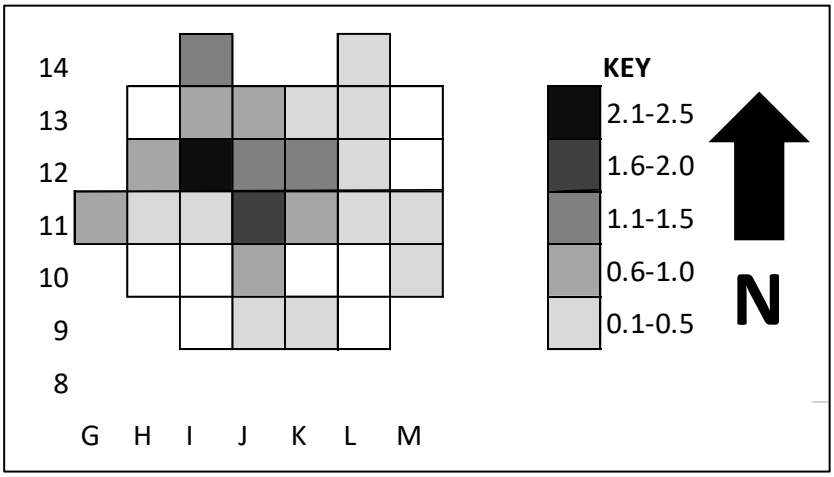

Figure 137: *Plan of SB2009/002 showing the distribution of ostrich eggshell fragments by weight (g).*

5.12.5. Discussion

This low density scatter reflects a place where people sheltered behind a boulder during LSA times. While some of the flaked artefacts are undoubtedly of greater age, this use of the area was enough to result in the breakage of one or more pots. The hammerstones and grindstones may have been left on site for repeated use each time the site was visited. It is impossible to know over what period of time the site was visited or how frequently, but visits must have happened within the last 2000 years because of the presence of pottery.

5.13. OP2009/003

On arrival at this location it was found that mining had already occurred there (Figure 138). The wider area was all mined so there was no possibility of even sampling an area close to the waypoint. The nearest intact area was in fact at OP2009/004 (see below).

Figure 138: *View towards the west across the area where the OP2009/003 scatter was. The waypoint was in the middle of the picture.*

5.14. OP2009/004

This scatter lay on the cobble terrace alongside the runway. Much disturbance of the surrounding area had occurred but a wedge of original terrace surface was still present alongside the runway and could be collected from. Some large vehicle tracks had also disturbed part of this area (Figure 139). An area of about 800 m^2 was available to sample artefacts (Figure 140). The original waypoint fell within this area. Figure 141 shows the surface appearance of the cobble terrace at OP2009/004 and Table 24 shows the site data.

Figure 139: *View towards the south over the preserved area of OP2009/004. The preserved area is located between the runway (dashed lines) and some large vehicle tracks in the foreground.*

Figure 140: *Aerial view of the area around OP2009/003 and OP2009/004. The runway is visible at lower right. Most of the land in view has been mined but a wedge of original surface was preserved at OP2009/004 (white polygon). Blue lines show the GPS tracks made during the work but are not comprehensive. Aerial photography date: 25th October 2018.*

Figure 141: *View of the surface at OP2009/004. Scale bar is 0.5 m.*

Table 24: *Site data for OP2009/004.*

Site location:	S 28 03 52.4 E 17 01 18.5
Landscape position:	Cobble terrace
Sampling methodology:	Surface collection
Area sampled:	*c.* 800 m^2
Sieve mesh size:	n/a
Find categories:	Stone artefacts
Age of site:	ESA, MSA

5.14.1. Stone artefacts

Only 36 artefacts were found in this area (Table 25). Diagnostic materials were rare but, on the whole, the assemblage character suggests a combination of ESA and MSA artefacts, probably mostly the former. A number of artefacts are quite weathered with rounded edges suggesting great antiquity and these, certainly, must be from the ESA. Just one artefact was in quartz with all the remainder being quartzite. The proportion of cortical artefacts was just less than half which suggests a greater amount of working at this point than was recorded on the Blokwerf terrace. Three cores were found. One was a radial core on a cobble. It was flaked along part of its periphery and on one face only (Figures 143-144). There were two irregular cores, one made on a cobble (Figures 145-146) and the other on an older artefact (Figures 147-148). The cobble core showed evidence of having been hit to break it open with the breaks then being used as striking platforms.

Table 25: *Stone artefacts from OP2009/004.*

Type	Quartz		Quartzite	
Cortex	**Y**	**N**	**Y**	**N**
Radial core	-	-	1	-
Irregular core	-	-	1	1
Retouched flake	-	-	1	2
Edge-damaged flake	-	-	-	1
Edge-damaged chunk	-	-	-	-
Blade	-	-	-	1
Flake	-	1	11	11
Chunk	-	-	2	3
Chip	-	-	-	-
Total	-	1	16	19

Figure 142: *View of all the artefacts collected from OP2009/004.*

There were three retouched flakes. One was very large with several scars along its margin (Figure 149). A smaller one had retouch on both laterals but each on a different surface (Figure 150). The third was unusual in having been retouched on the platform. The scars have penetrated onto the ventral surface indicating that they are not platform damage. Two flakes were found to have faceted platforms and these are more likely to date to the MSA than the ESA.

Figure 143: *View of the radial core with flaking around the left and lower parts of the periphery in this view.*

Figure 144: *Reverse view of the radial core in Figure 143 showing cobble cortex and some breaks or earlier scars.*

Figure 145: *Irregular core made on a broken cobble.*

Figure 146: *Reverse side of the irregular core in Figure 145.*

Figure 147: *Irregular core made on an older artefact.*

Figure 148: *Reverse side of the irregular core in Figure 147.*

Figure 149: *Ventral (left) and dorsal (right) surfaces of a large retouched flake.*

Figure 150: *Ventral (left) and dorsal (right) surfaces of a small retouched flake.*

Figure 151: *Ventral (left) and dorsal (right) surfaces of a flake retouched on its platform (upper margin in this view), effectively removing the platform.*

Figure 152: *Ventral (left) and dorsal (right) surfaces of two flakes with faceted platforms that are most likely to be from the MSA.*

5.14.2. Discussion

This collection of artefacts reflects the BGS content of the cobble terraces in this part of the mining area. The ESA seems to dominate.

5.15. OP2009/010

On arrival at this location it was found that mining had already occurred here (Figure 153). The wider area was all mined so there was no possibility of even sampling an area close to the waypoint. The nearest available area was close to OP2009/012 and this was sampled for that scatter (see below).

Figure 153: *View towards the south across the vicinity of OP2009/010.*

5.16. OP2009/012

This area was again very disturbed by past mining activities (Figure 154). The area where the original waypoint was did have a small area of unmined terrace preserved but it was disturbed by heavy vehicle wheels and artefacts were uncommon. Another patch located 15 m away from the waypoint was far denser and this area was chosen for the surface collection (Figure 155). The area available was only about 100 m^2. The surface had been cleared to the southwest of this patch revealing a short section some 0.35 m high (Figure 156). This showed that the deposits below the surface were no different to the top with the surface simply being deflated. There was again little point in establishing a formal grid and so a surface collection was taken.

Figure 154: *View towards the northeast across the small area available for artefact collection at OP2009/012. The original waypoint was located some 15 m to the east in the direction shown by the arrow.*

Figure 156: *Aerial view of the area around OP2009/010 and OP2009/012. Most of the land in view has been mined or disturbed in other ways but a wedge of original surface was preserved at OP2009/012 (white polygon). Blue lines show the GPS tracks made during the work but are not comprehensive. Aerial photography date: 25th October 2018.*

Figure 156: *View of the section visible in Figure 154.The surface is a deflated version of what lies below. The scale bar is 0.5 m.*

Table 26: *Site data for OP2009/012.*

Site location:	S 28 03 46.6 E 17 01 32.1
Landscape position:	Cobble terrace
Sampling methodology:	Surface collection
Area sampled:	*c.* 100 m^2
Sieve mesh size:	n/a
Find categories:	Stone artefacts
Age of site:	ESA

5.16.1. Stone artefacts

Only 39 artefacts were collected from this area (Table 27). All of them were made from quartzite. As at OP2009/004, non-cortical flakes were more numerous than cortical flakes suggesting a fair amount of stone working happening in the area. Four of the flakes had cortex that indicated collection of material from the mountains rather than the river terrace. There were three cores. A single platform core had several removals in a single plain from an older artefact (Figure 157). The other two were irregular cores (Figure 158). A number of artefacts were judged to have been retouched. These included a flake with irregular scars along its lateral margins (Figure 159) and a large cortical flake with a single notch retouched into its distal margin (Figure 160). Five of the retouched flakes had edges formed like scrapers (Figure 161). Just one of the four had preserved cortex showing that flakes produced later in the production chain were favoured for retouch in this way. Four of them were retouched opposite the striking platforms, while the fifth was retouched on a lateral margin. Interestingly, while these five artefacts were all found together, no other similar artefacts during the entire project.

Table 27: *Stone artefacts from OP2009/012.*

Type	Quartzite	
Cortex	**Y**	**N**
Single platform core	1	-
Irregular core	2	-
Retouched flake	1	6
Notched flake	1	-
Edge-damaged flake	4	5
Blade	1	-
Flake	6	12
Chunk	-	-
Chip	-	-
Total	16	23

Figure 157: *The opposite surfaces of the single platform core. The right view shows the newer removals (between arrows).*

Figure 158: *Two irregular cores.*

Figure 159: *A retouched flake with irregular scars along its lateral margins.*

Figure 160: *Ventral (left) and dorsal (right) views of a flake with a large notch retouched into its distal margin (arrowed).*

Figure 161: *Ventral (left) and dorsal (right) views of the five scraper-like retouched flakes. They are all placed with the retouch at the top. All have their striking platforms facing down except the one that is arrowed (arrow shows direction of striking).*

5.16.2. Discussion

This collection of artefacts again reflects the BGS content of the cobble terraces in this part of the mining area. The ESA seems to dominate.

5.17. OP Large Cutting Tool

While working at OP2009/004 it was noticed that an LCT was lying in the adjacent mine road. Lumps of red-brown sand were also present, some of which was adhering to the LCT. It was evident that it had fallen from a truck carrying overburden through the mine. The artefact is very characteristic of the ESA and can be labelled a handaxe (Figure 162). Its dimensions are 141.3 mm long, 100.7 mm wide and 48.5 mm thick. Unusually, it is not bifacial. It has only been flaked on one surface with the other surface being partly an earlier flaked surface (or perhaps a break) and partly cobble cortex. The cortex also extends around the base of the artefact. While the source of the artefact remains unknown, it certainly comes from the southwestern half of the Oena Proper mining area.

Figure 162: *The two edges and two faces of the LCT found in the road adjacent to OP2009/004.*

6. DISCUSSION

The cobble terrace scatters are dominated by quartzite throughout but striking differences were observed between the Blokwerf and Oena Proper terraces. These are tabulated in Table 28. They speak to the somewhat differing ways in which the two areas were used in the past. Of course much post-depositional history has also taken place and the artefacts would have been affected in various ways, including the addition of damage scars to the edges and the general weathering of the surfaces. This limits the amount of interpretation that can be applied to these materials. Nevertheless, although the collected samples are quite small, they do provide a record of the types of materials present in several parts of the terraces.

Table 28: *Observed differences between the Blokwerf and Oena Proper cobble terrace collections.*

	Blokwerf	**Oena Proper**
Age	MSA, but rare ESA and LSA present	ESA, but some MSA present
Stone materials	Quartzite dominates but various other materials occur including quartz, CCS and others	Very strongly quartzite dominated (only one quartz flake)
Cortex prevalence	More than 50%	Less than 50%

It is clear that, in general, the cobbles were an important source of stone materials during the ESA and MSA when larger artefacts were typically made. Cobbles are known to provide good flaking stone because, having survived their journey down river, they are durable and tough. The high number of cortical flakes indicates that hominins were flaking the stones on the terraces. The very low number of formal artefacts (like handaxes and cleavers for the ESA, and points for the MSA) is likely because these items were removed (or made elsewhere once suitable pieces of stone had been chosen) with only the waste products of manufacturing and stone sourcing being left behind.

As shown by other sites in the area, LSA people seem to have focused on quartz sourced from the quartz veins occurring in the mountains. Some quartz-rich artefact scatters along the foot of the mountains are very likely to be from the MSA, although, in the absence of diagnostic artefact types, this cannot be said with certainty.

Considering the nature of the LSA sites reported from elsewhere along the Orange River (see Section 4 above), it was surprising that the Phase 1 survey did not reveal more significant LSA occupation sites (Orton & Webley 2009). Those found and sampled here tended to be very small, very briefly occupied sites. The high frequency of potsherds compared to other cultural materials is curious and cannot readily be explained. In particular, the lack of stone artefacts, which normally dominate LSA assemblages, is surprising. Sadr *et al.* (2003) proposed a "ceramic index" to attempt to determine whether a site was left by hunter-gatherers or herders. They proposed that if more than 60% of the sum of all pot sherds and stone artefacts was pot sherds, then the site is likely to be a herder site. On the contrary, an index of less than 20% indicated a hunter-gatherer site. In the sites sampled here, where stone artefacts are almost entirely absent, and the sites are not longer term occupations with abundant finds, this index may not be appropriate. Since hunter-gatherers did use pots, it is theoretically possible that a group could stop briefly, break a pot, not do any tasks requiring stone tools, and then move on. Nevertheless, it is well-known that the Orange River valley was quite well populated with Khoekhoen herders during the last two millennia and it does still seem more likely that the pottery was left by herders.

The site at BW2009/001 – which was initially scheduled only for pottery collection, proved to be the most interesting and readily interpretable site of the entire project. It presents a snapshot in the life of a local person who stopped for a meal of cooked fish in the shade of a tree and then moved on having broken a pot (either accidentally or deliberately) while they were there. The site is probably quite recent and, in all likelihood, was left by a Khoekhoen herder.

7. CONCLUSIONS AND RECOMMENDATIONS

The work reported on here has captured a representative sample of the cobble terrace archaeology, although it is noted that because of disturbance in the Oena Proper mining area not all of the areas envisaged for sampling there could be worked on. It is likely that similar materials would have been found at those two other areas and that they would simply have allowed for the collection of a larger sample of the terrace archaeology. A very good sample of the sites located along the base of the mountains was obtained.

There is no need for any further work in the Blokwerf, Sandberg and Oena Proper mining areas, but it is noted that significant archaeological sites could still be located in areas that were not surveyed in 2009 because they are not inside the mining areas. This applies especially along the margins of the Orange River. For this reason, the mine should take care not to impact any areas that are not allowed to be mined and that have not been surveyed.

It is recommended that SAHRA endorse this report as proof of compliance with the mitigation requirements at Blokwerf, Sandberg and Oena Proper. However, the following should be noted:

- If, during the course of mining, any dense concentrations of archaeological material or any human remains (burials) are uncovered during the course of development then work in the

immediate area should be halted and the find protected from any further harm. The find would need to be reported to SAHRA 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.

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APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

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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.