ARCHAEOLOGICAL MITIGATION AT NAMAKWA SANDS, BRAND-SE-BAAI, VREDENDAL MAGISTERIAL DISTRICT, WESTERN CAPE: LANGLAAGTE 3 & SOUTPAN 2

Report prepared as part of an ongoing survey and mitigation program under a workplan approved by Heritage Western Cape.

HWC Case No.: 110804JB09

Report for:

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25 May 2015

EXECUTIVE SUMMARY

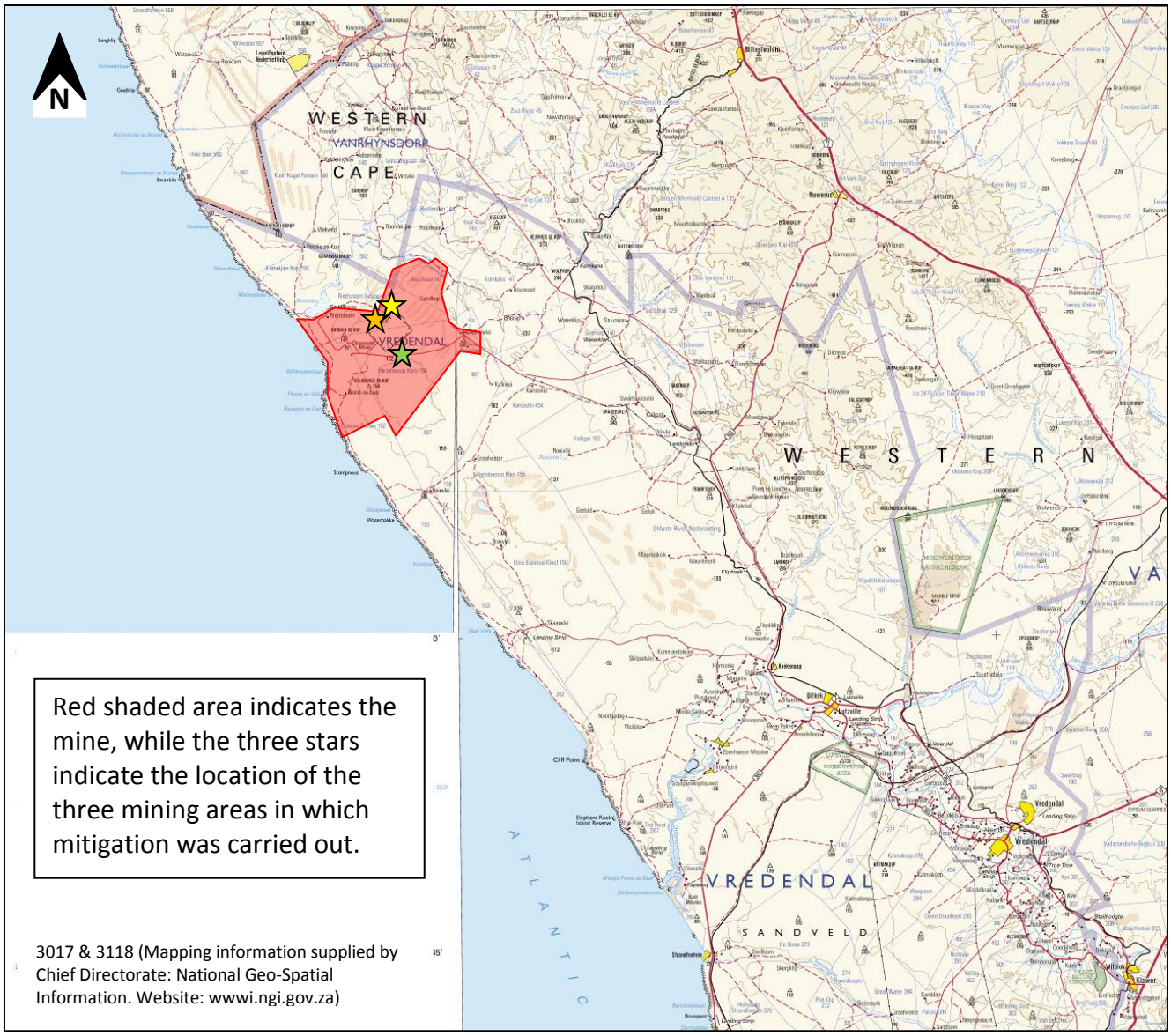
1. **Site Name**

Namakwa Sands Mine.

2. **Location** (Street address/farm name, town/district, erf number and GPS coordinates)

The mine is located 43 km northwest of Koekenaap on the west coast. The project took place on the farms Hartebeeskom 156 and Rietfontein Extension 151.

3. **Locality Plan**



4. Description of Proposed Development

The archaeological mitigation project is to clear certain areas of archaeological sites prior to open cast mining for the extraction of heavy minerals. The mine has been in operation for about 25 years and the proposed mining areas are an extension of their existing activities.

5. Heritage Resources Identified

A number of LSA artefact scatters were excavated and analysed. Other materials besides stone artefacts included on some of the sites are marine shell, ostrich eggshell, bone and charcoal. Items not related to the LSA archaeology are land snails, gun cartridges and rusted metal fragments. The locations of all these sites would be destroyed through the expansion of mining activities.

6. Anticipated Impacts on Heritage Resources

Although the sites would be destroyed, the mitigation program has meant that no further significant impacts are expected at any of the excavated sites. The chance of intersecting buried archaeological remains or human burials is small but ever present.

7. Recommendations

Although there are no areas that require *in situ* conservation, the chance always exists that buried archaeological remains or human burials might be encountered during the course of topsoil clearing. It is nevertheless recommended that mining be allowed to proceed as follows:

- Mining of all mining blocks within the Langlaagte 3 mining area should be allowed to proceed subject to the continued protection of HBK2014/018, HBK2014/020 and HBK2014/021 all located to the south of the main access road;
- Mining of all mining blocks within the Soutpan 2 mining area should be allowed to proceed;
- Mining of all mining blocks within the Joetsie mining area should be allowed to proceed subject to the continued protection of GR2014/001;
- If any archaeological material or human burials are uncovered during the course of mining then work in the immediate area should be halted. The find would need to be reported to Heritage Western Cape 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.

8. Author/s and Date

Jayson Orton, ASHA Consulting (Pty) Ltd, 25th May 2015

Glossary

Bioturbation: any one of a number of processes that results in the natural movement of artefacts in or on the ground after deposition by humans.

Conchoidal fracture: "the production of smooth convexities or concavities, similar to those of a clamshell, when fractured" (Andrefsy 2005:254).

Cortex: The unworked natural outer surface of a lump of rock.

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 20 000 years ago.

Hand-axe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age.

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

Isotropic: "a propensity to fracture with equal intensity and similar characteristics in all directions" (Odell 2003:16).

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

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

Palimpsest: Archaeological site with two or more occupations that have been conflated to a single archaeological horizon.

Patination: Change in the surface appearance of a stone due to chemical or mechanical weathering.

Abbreviations

ASAPA: Association of Southern African Professional Archaeologists

CCS: cryptocrystalline silica

CRM: Cultural Resources Management

EIA: Environmental Impact Assessment

ESA: Early Stone Age

GPS: global positioning system

HIA: Heritage Impact Assessment

HWC: Heritage Western Cape

LSA: Later Stone Age

MSA: Middle Stone Age

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

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

NID: Notification of Intent to Develop

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Tronox Mineral Sands (Pty) Ltd to carry out a program of archaeological mitigation at their Namakwa Sands mining operation in southern Namaqualand (Figures 1 & 2). The purpose of the mitigation was to clear certain areas of significant archaeological sites prior to open cast mining. A survey of four mining areas (Langlaagte 3, Soutpan 1, Soutpan 2 and Joetsie)[1] was carried out in November 2014 (Orton 2014a) and many sites were recorded. A total of fifteen sites considered significant enough to require mitigation were found to occur within these four areas.

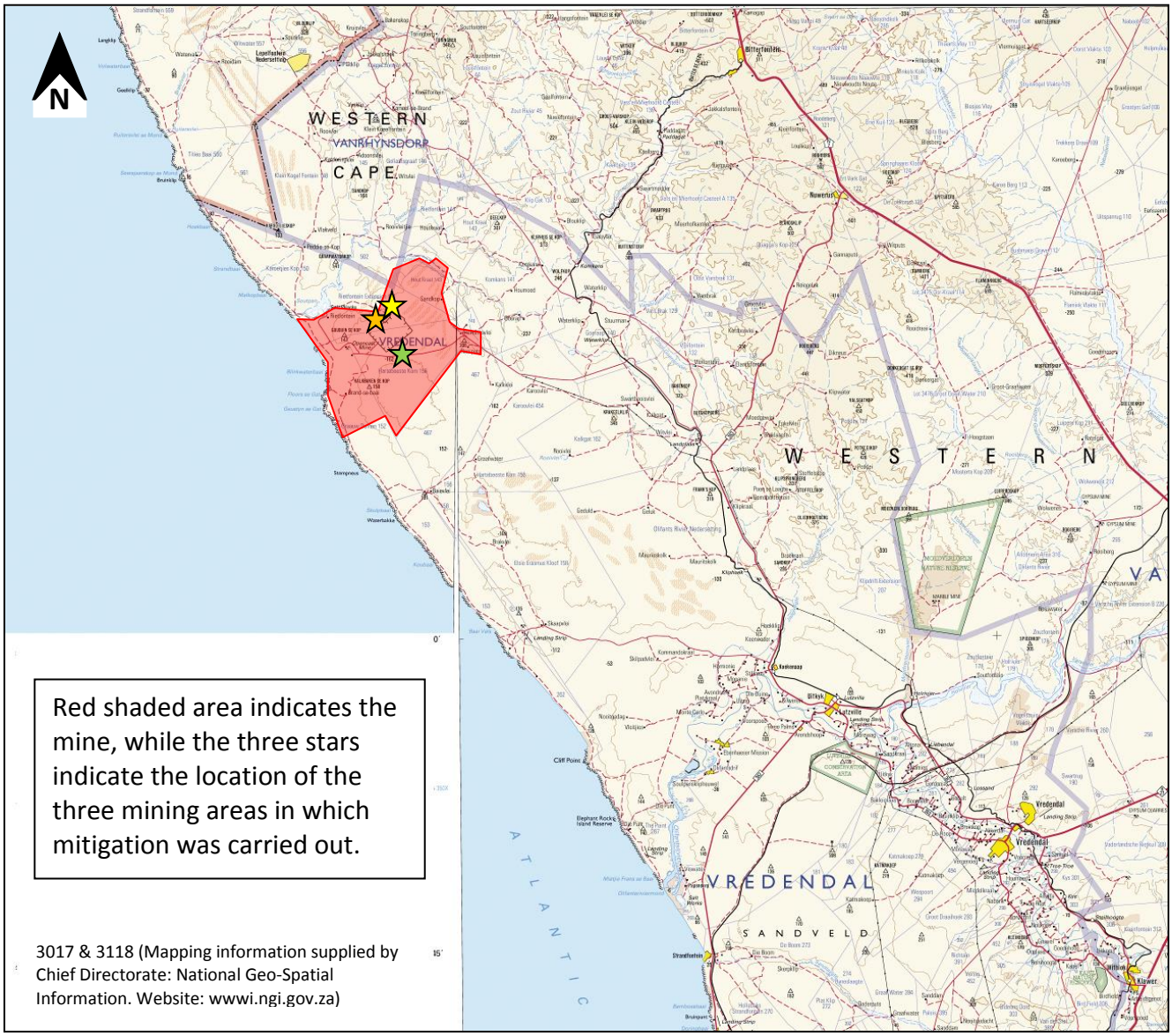


Figure 1: *Map showing the location of Brand-se-Baai 55 km northwest of the Olifants River mouth.*

[1] Note that Namakwa Sands is divided into two mines. Within the East Mine are various mining areas, including the four listed here, which are in turn divided into far smaller mining blocks.

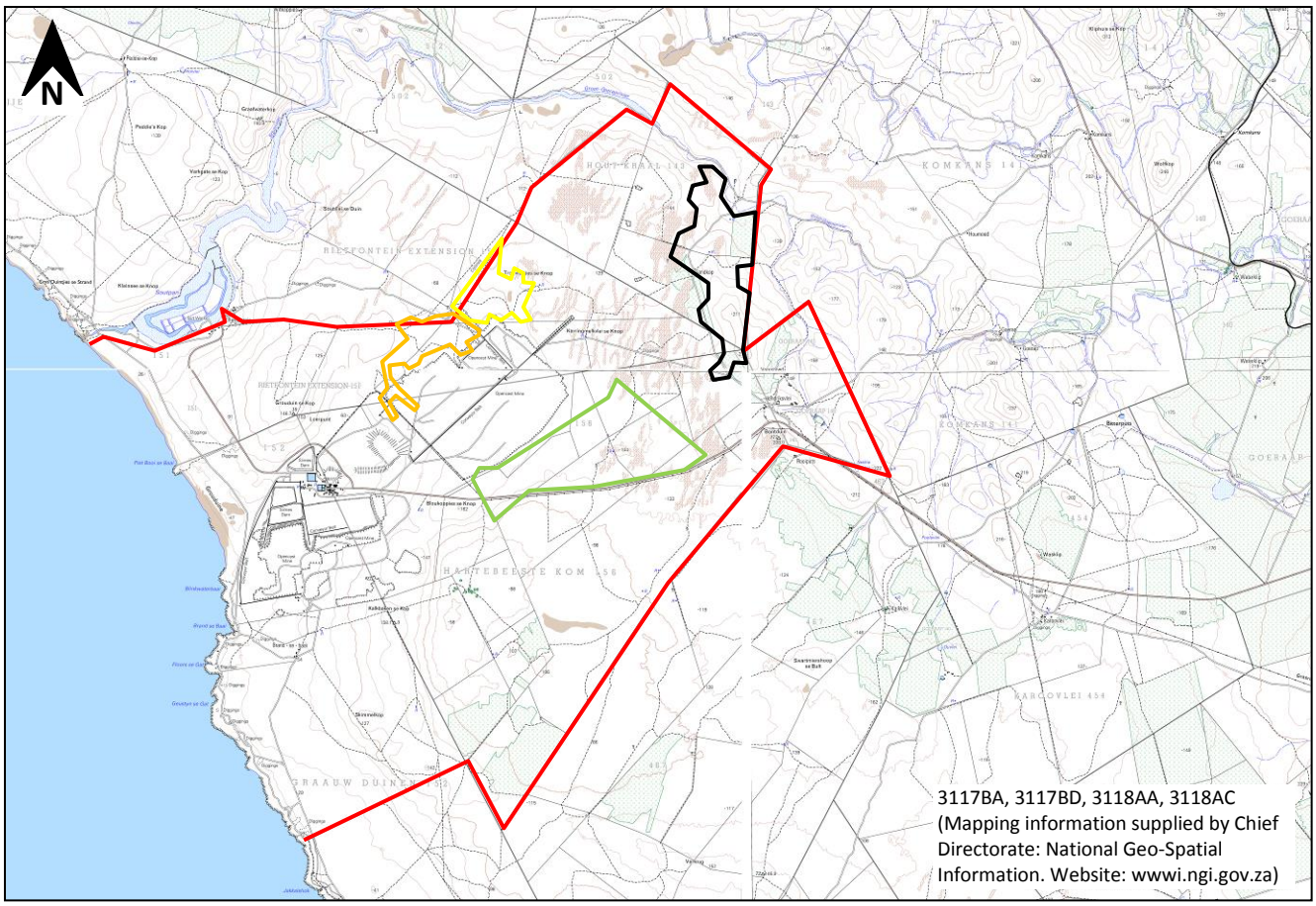


Figure 2: *1:50 000 topographical map of the Namakwa Sands Mine area showing the approximate boundaries of the surveyed areas: Joetsie (black), Langlaagte 3 (green), Soutpan 1 (yellow) and Soutpan 2 (orange). The red outline indicates the boundary of the mining right area.*

The present report only deals with archaeological sites in two of these areas: Langlaagte 3 and Soutpan 2. The one site suggested for mitigation in the Joetsie area has been excluded from mining for other reasons and is thus currently protected from mining. Excavations have been carried out at three sites in the Soutpan 1 mining area but two of these sites have revealed more significant deposits than anticipated and require further excavation before mining can be allowed to proceed. The three sites from this mining area will be reported on separately.

1.1. Terms of reference

ASHA Consulting was requested by Tronox Mineral Sands to conduct the archaeological mitigation work required by Heritage Western Cape (HWC) after a survey of various areas was conducted in late 2014 (Orton 2014a).

A Work Plan application was made to HWC in advance of carrying out the work. In response to this Work Plan, HWC issued the following comment giving guidance for both the mitigation work and subsequent mining activities:

HWC approves the work plan and the consultant's recommendations in general and has no objection to the mining of the Joetsie, Langlaagte 3, Soutpan 1 and Soutpan 2 areas proceeding however, this is subject to the following:

1.1. Archaeological mitigation must be carried out at the fifteen sites listed as follows: Joetsie GR2014/001, Langlaagte 3 HBK2014/004, Langlaagte 3 HBK2014/014, Langlaagte 3 HBK2014/015, Langlaagte 3 HBK2014/018, Langlaagte 3 HBK2014/020, Langlaagte 3 HBK2014/021, Langlaagte HBK2014/022, Langlaagte 3 HBK2014/30, Langlaagte 3 HBK2014/31, Langlaagte 3 HBK2014/034, Soutpan 1 RFE2014/004, Soutpan 1 RFE2014/007, Soutpan 1 RFE2014/010 & Soutpan 2 RFE2014/002

1.2 Mining must not extend outside of these four areas without further surveys being commissioned. No mining may proceed in any further mine sections until HWC has approved the archaeological survey report and 'Work Plan' for those sections.

1.3. If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

1.4. Adequate assessment of the age of these sites (radiocarbon dating) must be done.

It should be noted that the sites listed in Table 1 have been excluded from mining and have thus not been given further consideration during the present project. No mining blocks are planned for those areas at present. The current report thus deals with the mitigation of a total of eight archaeological sites, seven in Langlaagte 3 and one in Soutpan 2. Because two of the sites in Soutpan 1 require further work, they will be reported separately at a later stage.

Table 1: *Archaeological sites excluded from the present mitigation program and protected from mining activities.*

Mining area	Site name
Joetsie	GR2014/001
Langlaagte 3	HKB2014/018
Langlaagte 3	HKB2014/020
Langlaagte 3	HKB2014/021

1.2. Scope and purpose of the report

The present report describes the archaeological excavations carried out at Namakwa Sands during April and May 2015. The report seeks to elicit a positive comment from HWC that will allow mining of the relevant areas to continue.

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 the Western Cape and Northern Cape provinces of South Africa since 2004. He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited 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. HERITAGE LEGISLATION

The archaeological resources described here are protected under Section 35 of the National Heritage Resources Act (NHRA) No. 25 of 1999 which covers palaeontological, prehistoric and historical material (including ruins) more than 100 years old.

Following Section 2, the definition of archaeological material is as follows:

- "material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures"; b) "rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation"; c) "wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which the South Adfrican Heritage Resources Agency (SAHRA) considers to be worthy of conservation"; and d) "features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found".

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to describe the archaeological context of Namaqualand. This is important for aiding our understanding of the newly excavated sites. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2. Excavation methodology

All sites were excavated by hand using trowel and pan in 1 m^2 grid units. Excavation grids were laid out using long tape measures. A 1.5 mm sieve was used throughout to aid the recovery of small finds. When feasible, sorting was carried out on site, but at times the material from the sieve was bagged in bulk for later sorting. All finds were placed into plastic bags labelled according to their grid squares. Non-artefactual rock fragments were generally discarded since they tended to form a continuum between the ubiquitous large sand grains and the obviously manuported lumps of

rock. The latter, when greater than approximately 5 cm in maximum dimension, were recorded (presence and stone material type) and, in some instances (e.g. HKB2014/022), retained. After a brief examination, however, the majority were left on site.

After completion of each deflation hollow excavation the hollow was mapped by recording the distance between the excavated squares and the inner edge of the hollow (Figure 3). Large bushes that had trapped sand were indicated on the plans when necessary because these prevented the horizontal expansion of excavations.

The excavations were led by Dr Jayson Orton (D. Phil, Archaeology) with Chester Kaplan (BA (Honours), Archaeology) and Bjorn Kotze of Namaqua Sands providing assistance.

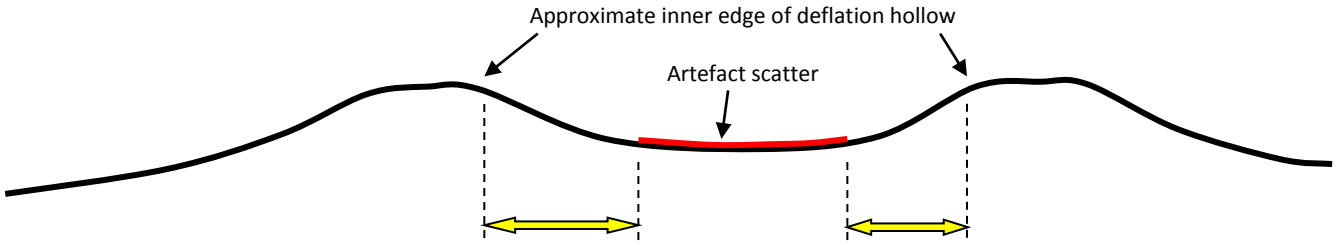


Figure 3: *Schematic cross-section through a deflation hollow indicating the approximate point at which the inner edge of the deflation hollows were mapped. The yellow arrows represent the distances recorded on site.*

3.3. Analysis and curation

Typological analysis of stone artefacts followed a system used by the present author for west coast assemblages over many years (e.g Orton 2002, 2006, 2009, 2012, 2014c; Orton & Halkett 2010) and based loosely on that compiled by Janette Deacon (1984). Stone materials were separated out into the usual categories of quartz, crypto-crystalline silica (CCS), silcrete, quartzite/sandstone and 'other', except that quartzite and sandstone were not distinguished because surface weathering on some of the artefacts has blurred the distinction. At times it was also difficult to distinguish between quartz and quartzite because the latter occurred along a continuum with some rocks being very pure silica quartzites with extremely few other minerals present. Materials listed under 'other' are generally rare rock types (often igneous rocks like quartz porphyry) or simply rocks that cannot be identified. Marine shell was analysed by species to obtain a minimum number of individuals (MNI) for each species. Marine shell was also weighed, as was ostrich eggshell and charcoal. Marine shell and ostrich eggshell samples were removed for radiocarbon dating as required.

After analysis, all material was placed into storage boxes and taken to the IZIKO SA Museum where it will be curated in perpetuity.

3.4. Assumptions and limitations

Although the majority of the archaeological material described in this report was located on the wind-scoured floors of deflation hollows, there is a chance that some material was obscured from view by sand trapped at the base of bushes growing in the hollows and hence was not collected. However, it is assumed that the majority of visible material has been collected in each case and

that the samples give a good account of the sites. Excavation proceeded as deep as was required to ensure capturing of all archaeological materials. Where necessary, excavation continued slightly deeper in order to confirm that the sand had become sterile and establish an excavation depth for the site.

4. PHYSICAL ENVIRONMENTAL CONTEXT

A detailed description of the general environment was provided in the survey report (Orton 2014a). However, it is noted here that the archaeological sites under discussion were largely located in deflation hollows within dune field contexts (Figure 4), but one was located within a small clearing on the side of a dune ridge.

Figure 4: *Example of a deflation hollow containing an archaeological site. This is site HBK2014/015 just prior to the commencement of excavation.*

5. ARCHAEOLOGICAL CONTEXT

This section of the report establishes what is already known about heritage resources in the vicinity of the study area. What is found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources. It deals only with archaeological heritage since other aspects of heritage are not assessed in this report.

5.1. Namaqualand review

All three Stone Ages are represented in the archaeological record of Namaqualand. Early Stone Age (ESA) stone artefacts, including the well-known hand-axes and cleavers, are known from throughout the region from the Richtersveld in the north to the Knersvlakte in the south and along the entire coastal stretch (Orton & Webley 2009; Halkett 2002a, 2006; Morris, 2004; Morris & Webley 2004; Orton & Halkett 2004; Halkett 2000a). These are usually isolated occurrences in secondary contexts, although sizeable scatters of ESA material have been located at Kleinsee (Halkett 2002a) an in the Knersvlakte (Orton, personal observation). One ESA artefact scatter and

quarry site surrounding a silcrete outcrop was excavated in the Namakwa Sands Mine area (Hart & Halkett 1994).

Middle Stone Age (MSA) material is also fairly widespread. Significant known sites include Spitzkloof in the Richtersveld (Dewar & Stuart 2012), sites with bifacial points from near Koingnaas (Halkett & Orton 2005) and from the Knersvlakte (Mackay *et al.* 2010) and the collapsed rock shelter deposit at VR003 (Steele *et al.* 2012). Rare and significant MSA sites containing shell and bone have been reported from the southern half of the Namaqualand coast (Halkett 2000b, 2001; Halkett *et al.* 1993; Hart & Halkett 1999) while a few other MSA sites are known from further north (Dewar 2008). One MSA site has been excavated in the Namakwa Sands Mine (Halkett *et al.* 1993). Throughout the southern parts of the Namaqualand Sandveld MSA artefacts are found in areas where the unconsolidated sands have been removed (Hart 2007; Orton 2010a, personal observation). The artefacts have deflated downwards and collected on the harder layer beneath. It is likely that some ESA material would also be found in this context.

Later Stone Age (LSA) sites are abundant throughout Namaqualand and particularly in areas within close proximity of the coast. Many surveys in the coastal region have revealed thousands of shell middens and scatters in various contexts including sand dunes, deflation hollows, cliff tops and in open, flat areas (Halkett 2000b, 2002b, 2006; Halkett & Hart 1997; Hart 1999, 2003, 2007; Orton 2010b, 2010c; Orton & Halkett 2004; Orton & Webley 2012a, 2012b; Patrick & Manhire 2014; Parkington & Poggenpoel 1991). Sites with reasonable amounts of shell on them can be found as far as 10 km inland. LSA sites include a wider variety of finds than earlier sites because their younger age means that preservation is better. Such finds include stone artefacts, bone tools, ostrich eggshell beads and water flasks, pottery and food waste including animal bones and rock lobster mandibles. These sites offer excellent opportunities to explore and better understand the recent pre-colonial history of the area with certain richer sites being particularly informative (e.g. Dewar 2008; Dewar *et al.* 2004; Orton 2012, 2014c). More ephemeral sites also have a story to tell because they might relate to a particular time period or segment of an annual migration cycle that is not recorded at larger sites (Orton 2007c).

Archaeological work already carried out at Brand-se-baai has resulted in the recording of many archaeological sites in the region. Some of these have been salvaged prior to mining but others have been lost, mainly in the inland areas. Several shell middens have been excavated from along the coastal strip (Halkett *et al.* 1993), while a number of sites from further inland have also been sampled (Hart & Halkett 1994; Hart & Lanham 1997). As expected, all the radiocarbon dates obtained on the SA sites date to the latter half of the Holocene mirroring the pattern evident on the northern part of the coast (Orton 2012). It is surprising, however, that only one post-dates 2000 years ago – such recent dates are dominant elsewhere. Perhaps the most important site discovered at Namakwa Sands is HK11, a small rock shelter site in the eastern part of the mine (Figure 9). This site has an extensive talus slope and it contains a wide variety of archaeological materials (Hart & Orton 2007).

Further inland LSA archaeological material is usually found associated with landscape features such as river valleys, deflation hollows, or rocky outcrops where these are present. Only one very rich deflation hollow has been located in Namaqualand and this was close to Kleinzee in the north (Orton 2007b). Near Elands Bay to the south of Namaqualand there are large numbers of hollows preserving much archaeological material (Manhire 1987a, 1987b). Along the Buffels River, near Kleinzee, Orton (2007b) excavated a number of hollows containing light traces of relatively recent

precolonial occupation – most sites had pottery demonstrating an age of less than 2000 years. In southern Namaqualand most recorded deflation hollows contain rather ephemeral artefact scatters (Hart 2007; Hart & Halkett 1994; Hart & Orton 2005). Further inland, the Knersvlakte has revealed a few LSA sites in rock shelters and one in the open. These all occur along the Varsche River valley (Orton 2012; Orton *et al.* 2011).

Rock art occurs in various parts of Namaqualand (Morris & Webley 2004; Rudner & Rudner 1968; Webley 1984; Orton 2013) with the nearest to the study area being in a valley a few kilometres east of the current study area (Orton 2012, 2013). Two painted sites exist on the north bank of the Oliphants River, southwest of Koekenaap, with the larger one once having contained an extremely significant archaeological deposit that has now been all but completely destroyed (Orton 2012, 2013).

Pre-colonial burials occur all over South Africa but are particularly frequently encountered in coastal dune systems, no doubt as a result of the soft sand that was easy to excavate by hand. Most burials are discovered accidentally during the course of development and are therefore wholly or partly disturbed without a proper record being made. Only one burial has been discovered in Namaqualand during archaeological excavations and this one, near Kleinzee, revealed grave goods in the form of an ostrich eggshell bead bracelet, two *Conus* shells (often used as decorative items) and a bone melon knife (Orton 2007a).

Although the extensive work carried out along the northern Namaqualand coastline has allowed a relatively robust cultural sequence to be described there (Dewar 2008; Orton2012), this sequence is very different to that documented to the south of Namaqualand. As a result, the intervening area is important because we do not yet know where the archaeological signature changes and why it does this. The region is critical to the understanding of the spread of domestic stock within the last 2000 years (Orton 2012) and more observations from southern Namaqualand may help to answer questions still remaining.

5.2. Previous work at Namakwa Sands

A number of surveys have been conducted at the Namakwa Sands Mine since its inception. The first was not comprehensive but explored the area very widely (Parkington & Poggenpoel 1990). This survey served to establish the archaeological potential of the area. It recorded about 100 Stone Age archaeological sites in a variety of contexts including coastal shell middens, artefact assemblages in deflation hollows, stone quarries and one rock shelter. The vast majority of the sites recorded by that survey were shell middens located within approximately 1 km of the coast, while the remainder were scattered throughout the study area as far as 14 km inland. A few years later, Parkington and Hart (1993) examined the alignment of the main access road noting five archaeological sites with little research value. In the same year Halkett and Hart (1993) excavated a series of coastal sites along the rocky shore stretching southwards from Brand-se-Baai. Hart (1994) looked at a small area proposed for a trucking facility and found no archaeological sites. Hart and Halkett (1994) surveyed the area earmarked for the first phase of mining. They then excavated four archaeological sites, three LSA shell middens and a silcrete outcrop that had been used as a quarry site since ESA times – these sites all lay close to the coast. Hart & Lanham (1997) excavated and reported on two further LSA shell middens located immediately inland of Brand-se-Baai.

Since the 1990s, no further mitigation work has been carried out at Namakwa Sands, although further surveys have been undertaken. In the first a few small areas were examined in order to increase our understanding of the distribution of archaeological heritage resources on the local landscape. This was also the first survey report to describe in detail the nature of the archaeological occurrences present (Hart & Orton 2005). Orton's (2010) survey of the area close to the Sout River (actually for a wind farm proposal) documented deflation hollow sites as well as older artefacts associated with gravels. A more recent but very brief survey documented a few archaeological occurrences along the Groot Goeraap River to the north of the mine and others along the coast to the south of the mine (Patrick & Manhire 2014). The survey on which the present mitigation was based examined areas away from rivers and the coastline and reported many deflation hollow sites and a few scatters located on hilltops (Orton 2014a).

6. FINDINGS

This section describes the archaeological sites excavated during the course of the mitigation project. These sites have been excavated from the Langlaagte 3 and Soutpan 2 mining areas.

6.1. HBK2014/004

6.1.1. Excavation details

This small site was excavated on 21st April 2015. A total of 34 m^2 was excavated in 1 m^2 units (Figure 5) using a 1.5 mm sieve throughout. The surface sand was fairly loose but within some 5 cm to 10 cm excavation depth the sand became firm and there was no more archaeological material. After completion of the excavation, which sampled the densest part of the hollow, it was noted that a very ephemeral scattering of archaeological material was still present to the north of the grid area. This scatter did not merit a surface collection as only about five or six artefacts were visible. One was a large quartzite flake. It is likely that more than 90% of the archaeological material was excavated. Figure 6 shows a view across the site.

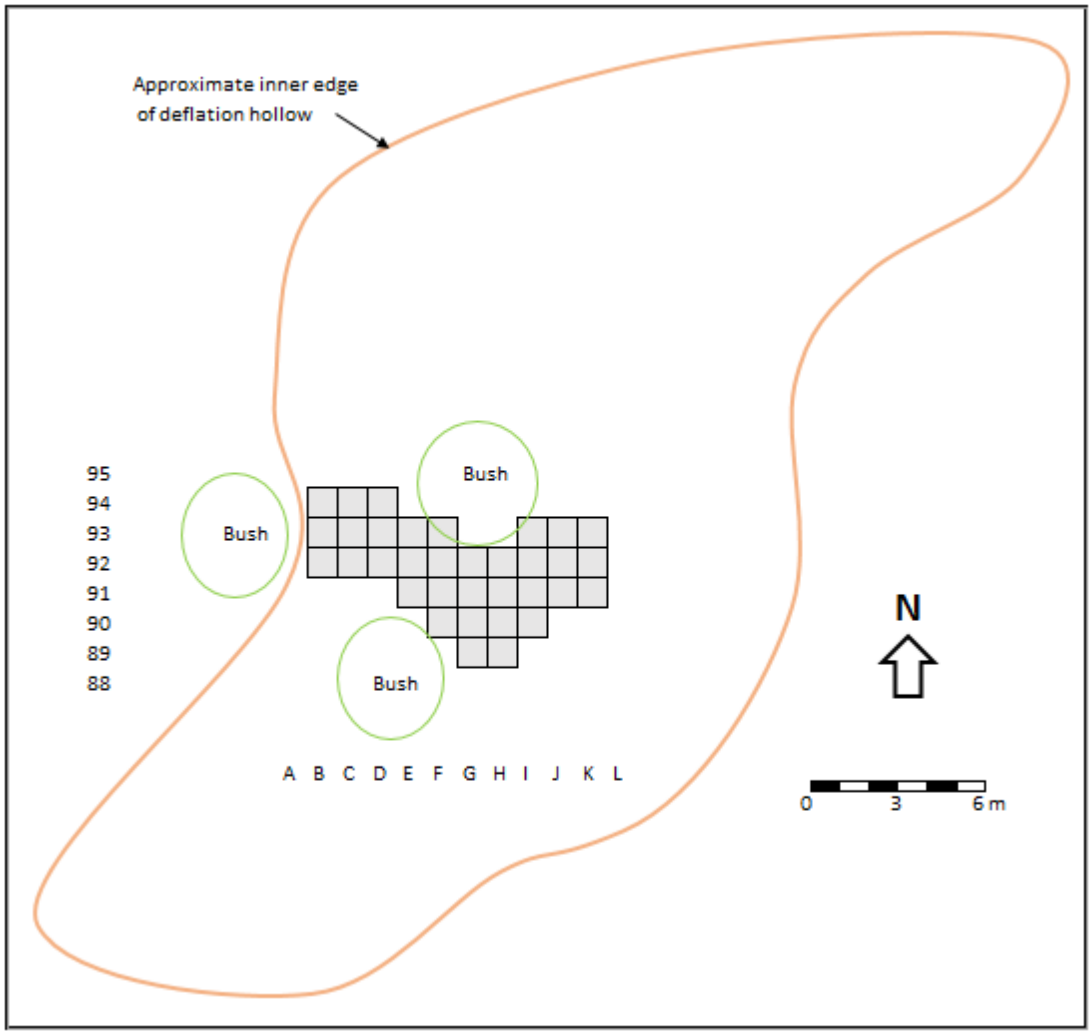


Figure 5: *Plan of site HBK2014/004 showing the location of the excavation within the deflation hollow and the location of the three bushes with associated trapped sand that limited excavation.*

Figure 6: *View across site HKB2014/004 looking towards the northwest just prior to excavation. The archaeological scatter lay predominantly in and immediately around the area enclosed by the tape measure while the larger part of the hollow lies out of view towards the right.*

6.1.2. Stone artefacts

A small collection of mostly quartz flaked artefacts was recovered from HKB2014/004 (Tables 2 & 3). The 197 artefacts were distributed throughout the excavation area, although the eastern part tended to have fewer (Figure 7). Just one core was found and there were three retouched items; all of these lay in the southern part of the site (Figure 8). One quartz flake exhibited cortex suggestive of the artefact having been made from a water-rolled lump of quartz, while another showed cortex indicative of the rock having been collected from an eroding quartz vein. The site may have been made by the makers of an industry that occurs throughout Namaqualand and is focused on the use of clear quartz and the production of small backed tools (Orton 2012). As is expected of such assemblages, quartz dominates very strongly; it comprises 97.5% of the flaked artefact assemblage Table 3).

Table 2: *Stone artefacts from HBK2014/004.*

Artefact type	Quartz	Silcrete	Quartzite
Backed bladelet fragment	1		
Backed point fragment	1		
Backed flake	1		
Irregular core	1		
Bladelet	9		
Flake	76	2	2
Chunk	11		1
Chip	92		

Table 3: *Flaked stone materials from HBK2014/004.*

Material	%
Quartz	97.5
Silcrete	1.0
Quartzite	1.5

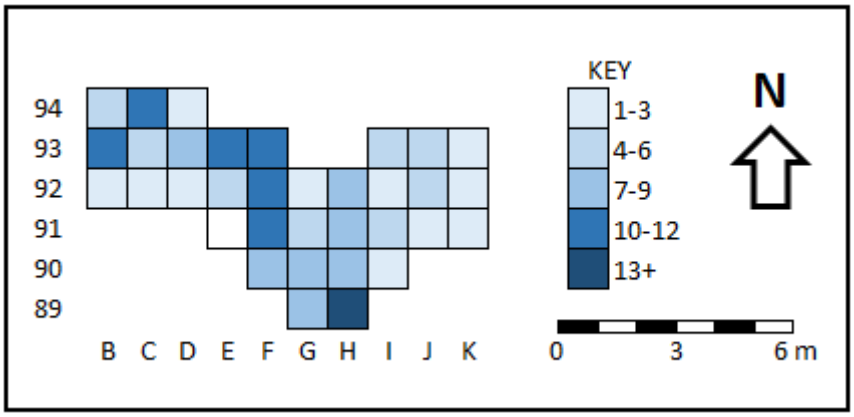


Figure 7: *Plan of HBK2014/004 showing the density of flaked stone artefacts across the site.*

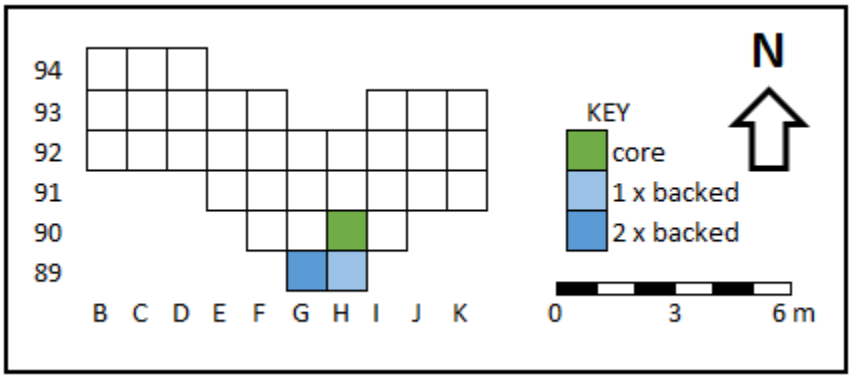


Figure 8: *Plan of HBK2014/004 showing the locations of the core and retouched items.*

6.1.3. Snail shell

A single snail shell was found (in square B92). The shell was obviously recent since it still retained some of its pink colour; it was not retained in the collection.

6.1.4. Age of site

Although the assemblage is small, the very high frequency of quartz and the presence of quartz backed tools suggests the site to belong to the industry referred to as Group B in Orton (2012). Such sites date within the last 2100 years. Unfortunately the site contains no material suitable for radiocarbon dating.

6.2. HBK2014/014

6.2.1. Excavation details

This site was excavated on 27th and 28th April 2015. A total of 137 m^2 was excavated in 1 m^2 units (Figure 9) using a 1.5 mm sieve throughout. The nature of the site was such that all artefacts were found to be contained within the upper 3 cm of sand The vast majority, in fact, were probably in the uppermost 1 cm. Figure 10 shows a view across the deflation hollow prior to commencement of excavation. Figure 11 shows the surface appearance of one of the denser sections of the artefact scatter. Although our excavation would have covered less than half the area containing stone artefacts, it is estimated that approximately 70% of the actual artefacts were collected by the excavation. The majority of the remainder of the deflation hollow contained very light artefact scatter that was not collected.

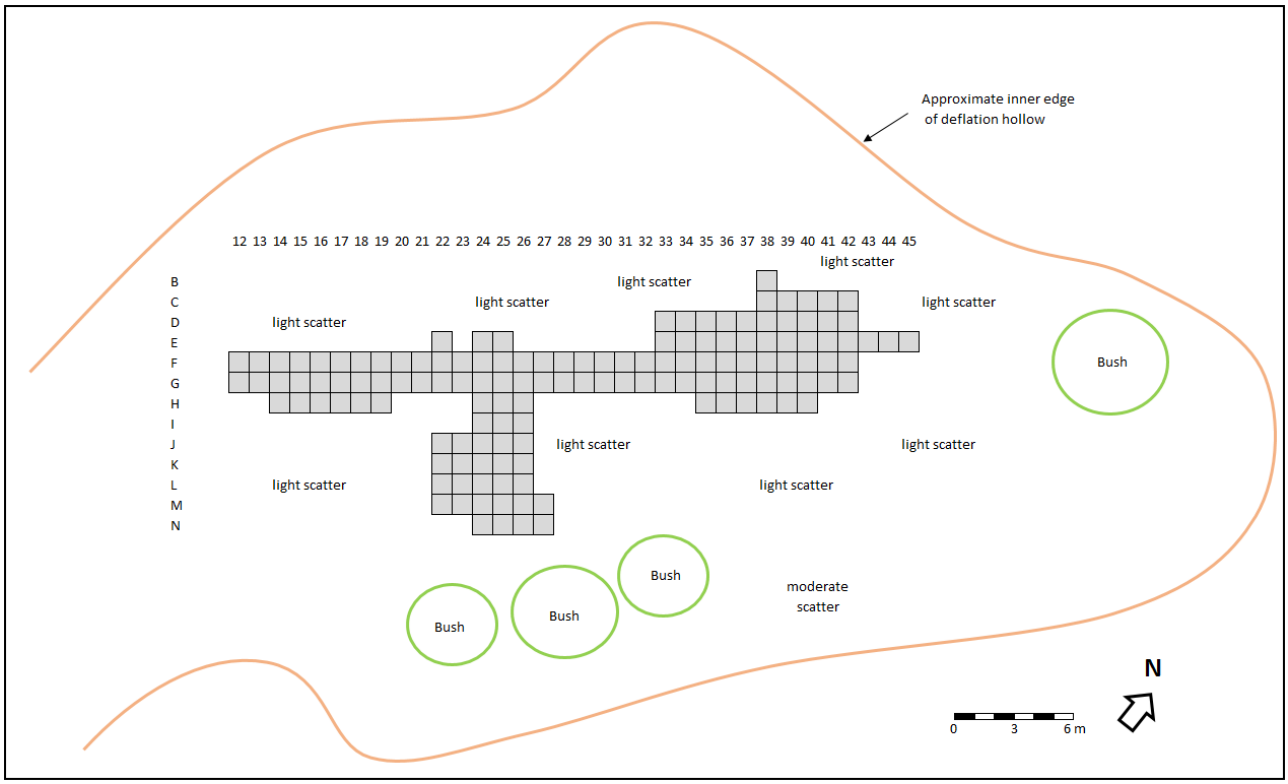


Figure 9: *Plan of site HBK2014/014 showing the location of the excavation within the deflation hollow and the locations of the remaining artefact scatter that was not excavated. The south-western end of the deflation hollow is open.*

Figure 10: *View across site HBK2014/014 facing towards the east.*

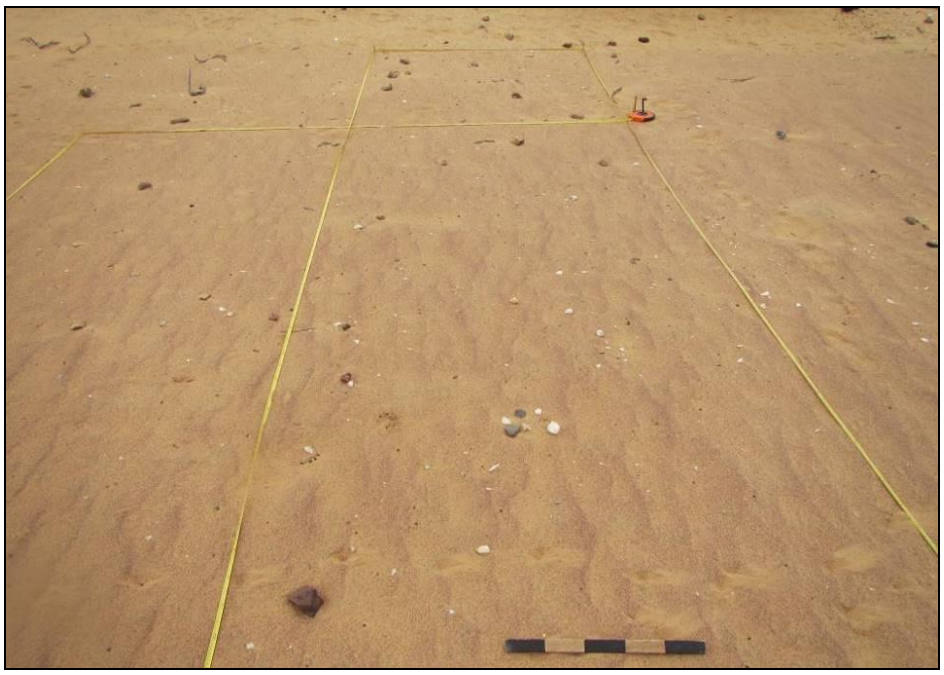


Figure 11: *View across the I-K 24-26 squares facing towards the southeast showing the density of artefacts at one of the denser patches on the site. The scale bar is 0.5 m long.*

6.2.2. Stone artefacts

Many stone artefacts were recovered from the site (Table 4). There were 4299 flaked artefacts and two hammer stones. The vast majority of artefacts were in quartz (Table 5). Although the artefact scatter appeared to cover virtually the entire floor of the deflation hollow, the density was quite variable across space with clear patches of concentration indicating activity areas on the site (Figure 12). Both hammer stones were associated with such patches. Retouched items were less frequent than anticipated (1.44% of all artefacts) but a number of backed items and scrapers were noted. There was interesting patterning in the locations of the retouched artefacts. Figures 13 to 16 show the distributions of quartz, CCS and silcrete backed tools and scrapers. While quartz backed artefacts were distributed across the site (Figure 13), those in other materials were restricted to two neighbouring squares (Figure 14). Amongst the scrapers, those in quartz and CCS clustered in two different areas (Figures 15 & 16). Further, different types of tools were located in different areas (Figure 17). In Namaqualand segments tend to be most common on older mid-Holocene sites (dating *c.* 6000 – 5000 years ago) and side scrapers on younger ones (dating *c.* 4000 – 2000 years ago). The fact that these two artefact types are concentrated in different parts of the site might suggest that the scatter in the northern area is older than that in the south-eastern area. There is, of course, also the chance that this distribution reflects activity differences across the site with tasks requiring backed artefacts being focused in the north and those requiring scrapers being focused in the south. In any event, the ratio of backed tools to scrapers (22:35) suggests that the majority of the site likely post-dates the mid-Holocene.

Table 4: *Stone artefacts from HBK2014/014.*

Artefact type	Quartz	CCS	Silcrete	Quartzite	Other
Segment	8				
Backed bladelet	2	1			
Curve-backed bladelet	1				

Backed point	3				
Backed bladelet fragment	1				
Backed flake	2				
Miscellaneous backed piece	1				
Backed piece fragment	2		1		
Backed scraper	2				
Side scraper	9	4			
Thumbnail scraper	5	2			
Miscellaneous backed scraper	1				
Miscellaneous scraper	2				
Scraper fragment	8	2			
Notched piece	1				
Denticulate	1	1			
Miscellaneous retouched piece		1		1	
Bipolar core	7	4			
Single platform core	8	1			
Radial core		1		1	
Irregular core	17		1	1	3
Edge-damaged flake	10			1	
Edge-damaged chunk		1			
Blade	13	3			
Bladelet	121	1	1	7	
Flake	1322	55	53	125	54
Chunk	436	28	9	12	7
Chip	1818	37	27	30	22

Table 5: *Flaked stone materials from HBK2014/014.*

Material	**%**
Quartz	88.4
CCS	3.3
Silcrete	2.1
Quartzite	4.1
Other	2.0

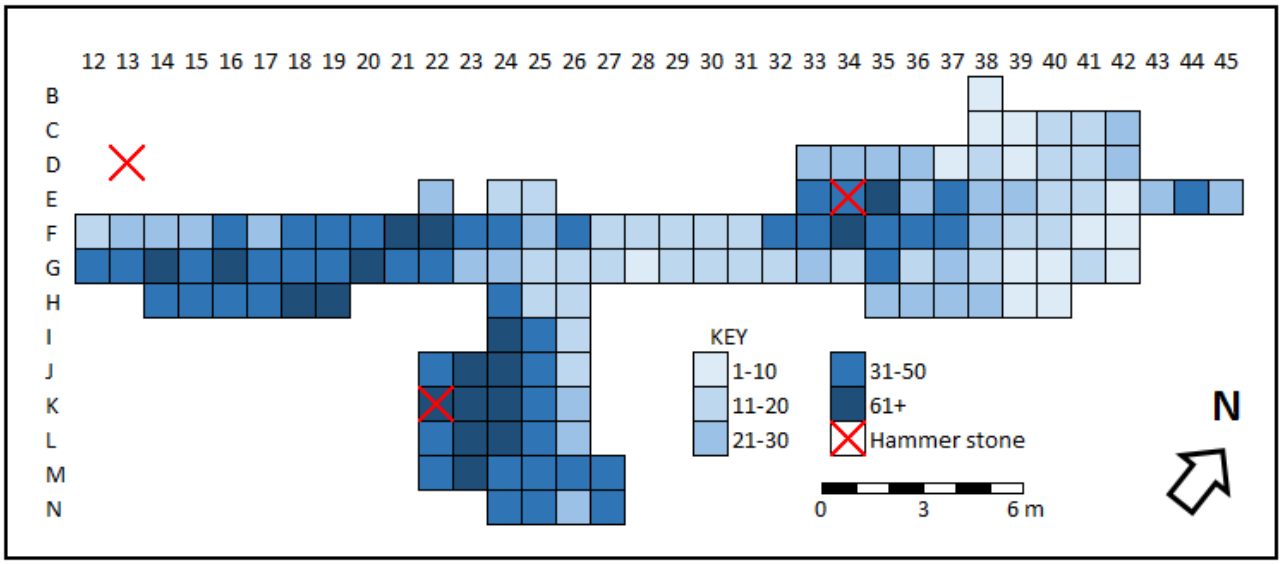


Figure 12: *Plan of HBK2014/014 showing the density of flaked stone artefacts and the location of hammer stones across the site. The hammer stone in D13 was collected from an unexcavated square.*

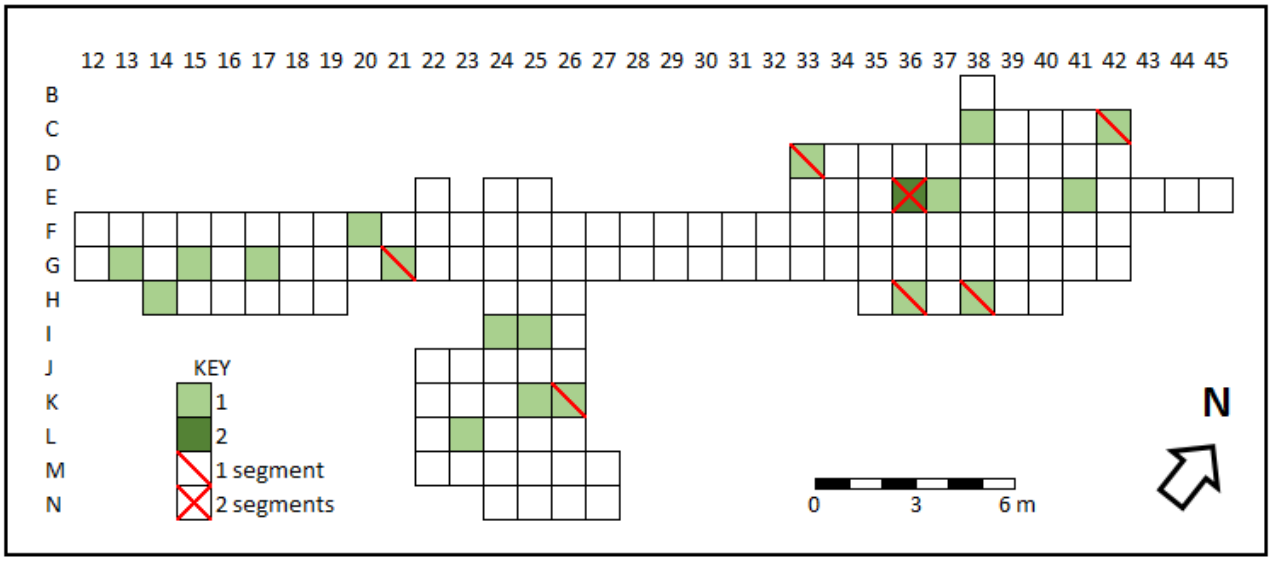


Figure 13: *Plan of HBK2014/014 showing the density of quartz backed artefacts across the site.*

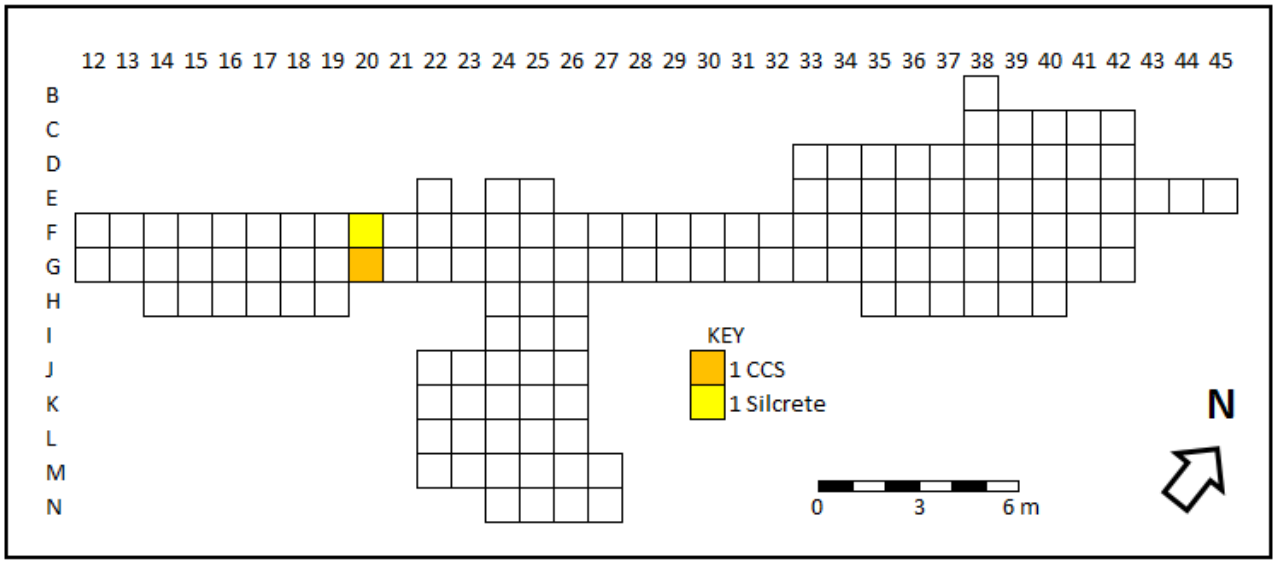


Figure 14: *Plan of HBK2014/014 showing the density of CCS and silcrete backed artefacts across the site.*

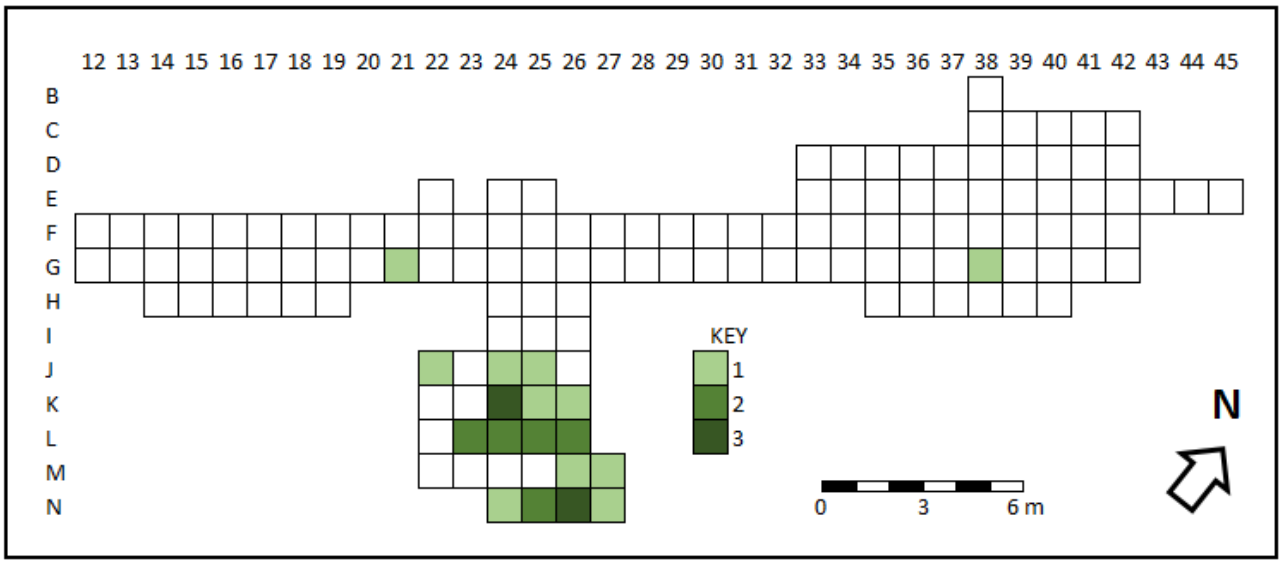


Figure 15: *Plan of HBK2014/014 showing the density of quartz scrapers across the site.*

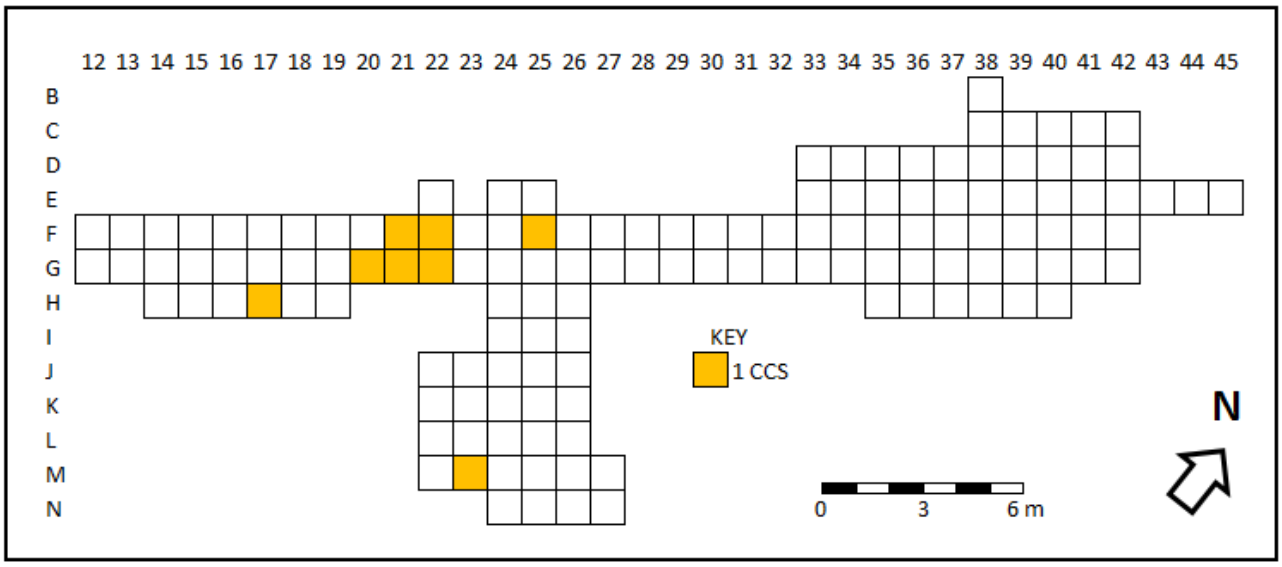


Figure 16: *Plan of HBK2014/014 showing the density of CCS and silcrete scrapers across the site.*

The wide diversity of stone materials at this site was notable. Most of the material listed as 'other' was a dark, fine-grained rock with crystal inclusions. It is probably a quartz porphyry and would have been collected as cobbles, probably from the coast (Figure 18).

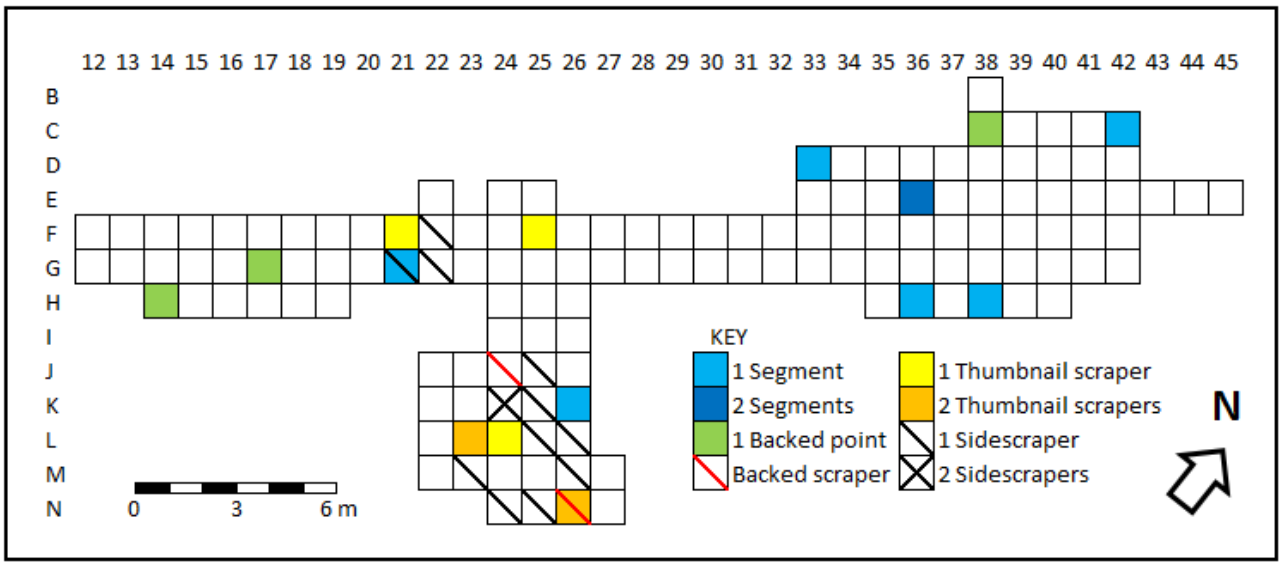


Figure 17: *Plan of HBK2014/014 showing the distribution of certain formal tool types across the site.*

Figure 18: *Examples of artefacts made on the black pebbles listed under 'other' materials from HBK2014/014 (square I25).*

Bladelet cores are absent from the assemblage. As such, those blades and bladelets that are present tend to be rather irregular and lack the parallel margins of bladelets produced using formalised bladelet cores (Figure 19). These blades and bladelets were likely produced by chance. Among the formal component, thumbnail scrapers are generally far less common than side scrapers and, on earlier sites, backed scrapers; this pattern is true on HBK2014/014. They are characteristically short and squat (Figure 20), while side scrapers and backed scrapers tend to be long and thin. The side scraper shown in Figure 21 has a section of cortex adhering to it which, for some reason, was not removed when the artefact was made. Segments are small crescent shaped artefacts shaped just like an orange segment (Figure 22). Denticlates are occasional inclusions on Holocene LSA sites. The two found here are rather informal but do bear a number of tiny notches spread along one edge of each piece. These denticulates are far less formal than those described from Jakkalsberg N in the Richtersveld (Orton & Halkett 2010) but follow a similar idea.

Figure 19: *Five bladelets and two blades from HBK2014/014 (square E35). Scale in 5 mm intervals.*

Figure 20: *Two quartz thumbnail scrapers from HBK2014/014 (square L23). The retouched margins are at the top in each case. Scale in 5 mm intervals.*

Figure 21: *A CCS side scraper from HBK2014/014 (square G22) showing the characteristic long, thin shape. The retouched margin is at the top. Scale in 5 mm intervals.*

Figure 22: *A quartz segment from HBK2014/014 (square H38). The retouched margin is at the top. Scale in 5 mm intervals.*

Figure 23: *Quartz and CCS denticulates from HBK2014/014 (square H35). Both views are of the ventral surfaces with the notches along the right hand margin. Scale in 5 mm intervals.*

Manuports exceeding approximately 5 cm maximum dimension occurred throughout the site. There was no obvious clustering of these manuports, although they were rare in the south-western part of the site (Figure 24). No obvious evidence of their use could be found. Some of them may have exhibited evidence of fire-cracking, but there was certainly no blackening. If fire-blackening had been present exposure over several thousand years may well have removed these

traces. It was notable that there was much variety amongst the manuports with some being small pieces of flat slabs, others being rounded cobbles and others angular lumps of rock (Figure 25). Occasionally some of these angular rocks exhibited evidence of flaking; such items were not recorded as manuports and were retained in the collection. No unmodified rocks were retained in the collection with the exception of a number of fragments of ochreous rock that may or may not have been collected by the inhabitants of the site. There was no evidence of use of any of these fragments and their texture generally suggested they would have not been suitable for grinding into a powder (Figure 26). Eighteen such fragments with finer textures were collected during the excavation but these are not mapped or quantified, since it appears more likely that they are a natural occurrence, probably brought to the surface by bioturbation over the years and then accumulated in the hollow with the stone artefacts through deflation. Many other similar nodules of varying texture were found but not retained.

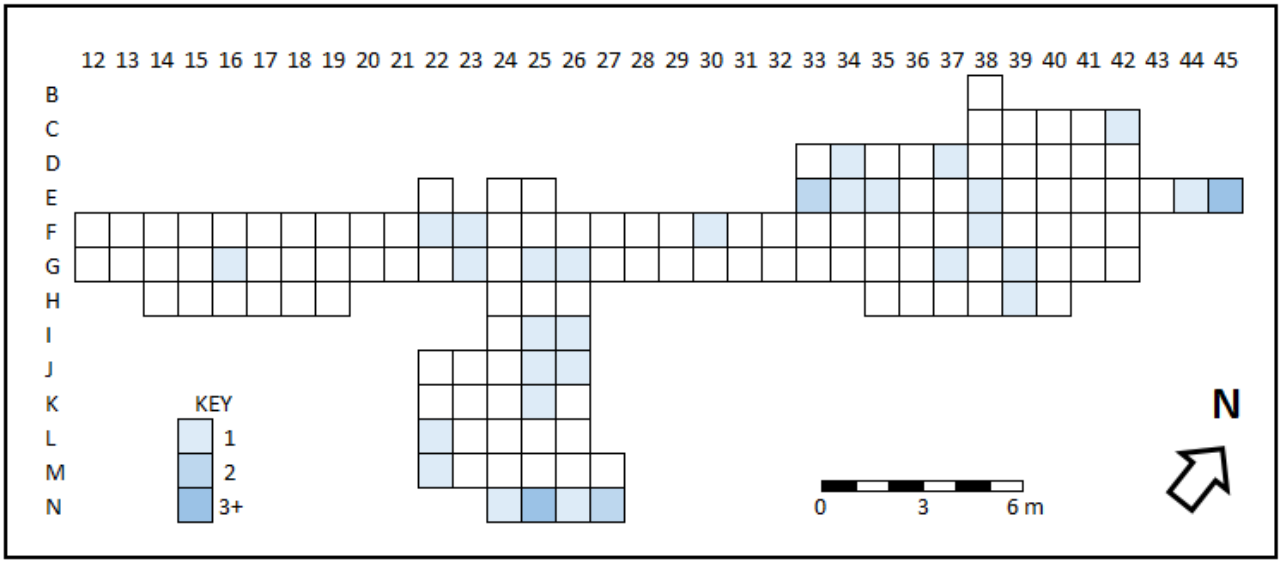


Figure 24: *Plan of HBK2014/014 showing the distribution of manuports of greater than about 5 cm maximum dimension.*

Figure 25: *Examples of the manuports mapped in Figure 24 above. The scale bar is in 10 cm intervals.*

Figure 26: *Examples of the ochreous nodules found on site. The scale bar is in 1 cm intervals.*

6.2.3. Ostrich eggshell

Just five fragments of ostrich eggshell weighing a total of 3.1 g were found on the site. All were at the northern end (Figure 27). There were no anthropogenically modified pieces and nothing more can be said of them.

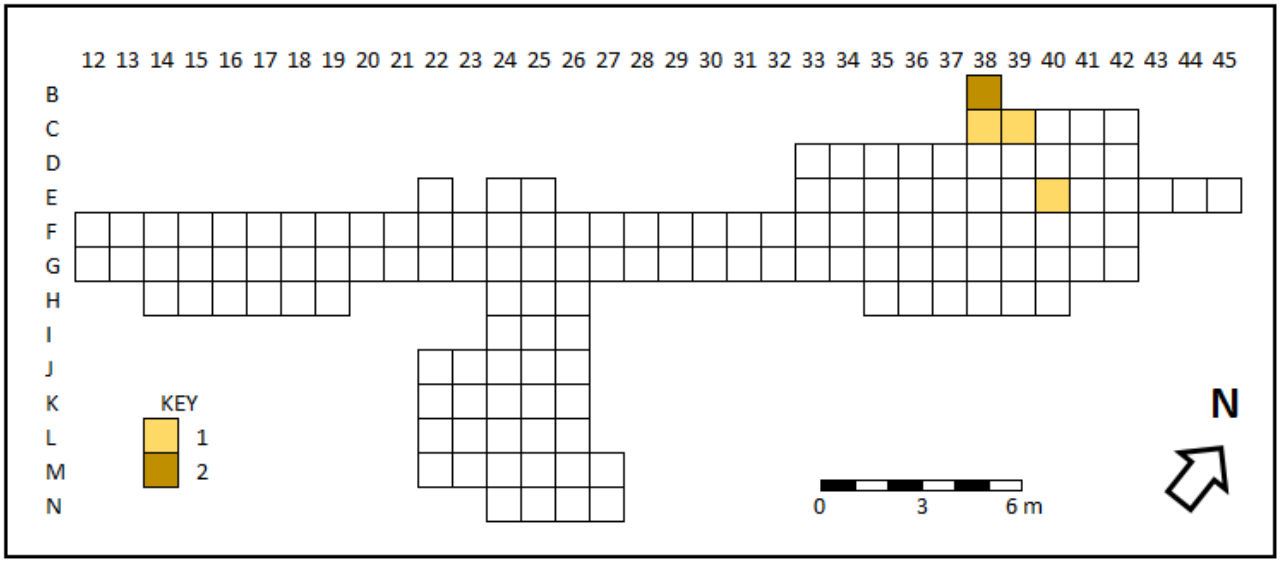


Figure 27: *Plan of HBK2014/014 showing the distribution of ostrich eggshell fragments by number.*

6.2.4. Snail shell

Fragments of snail shell (*Trigonphrus globulus*) were found in 32 squares spread across the site (Figure 28). Although snails are known to be directly associated with archaeological artefacts at some sites in southern Namaqualand (Orton *et al.* 2011) and Namibia (Jacobson & Noli 2008), it seems more likely that those found here relate to natural die-off and, as such, they were not quantified. The density was far too low for anthropogenic collections and the clusters of squares containing fragments more likely represent fragments of individual snails. One snail still retained its colour and was obviously very recent. Because of the element of doubt at the time when this site was excavated and analysed, all snail was, however, retained in the collection.

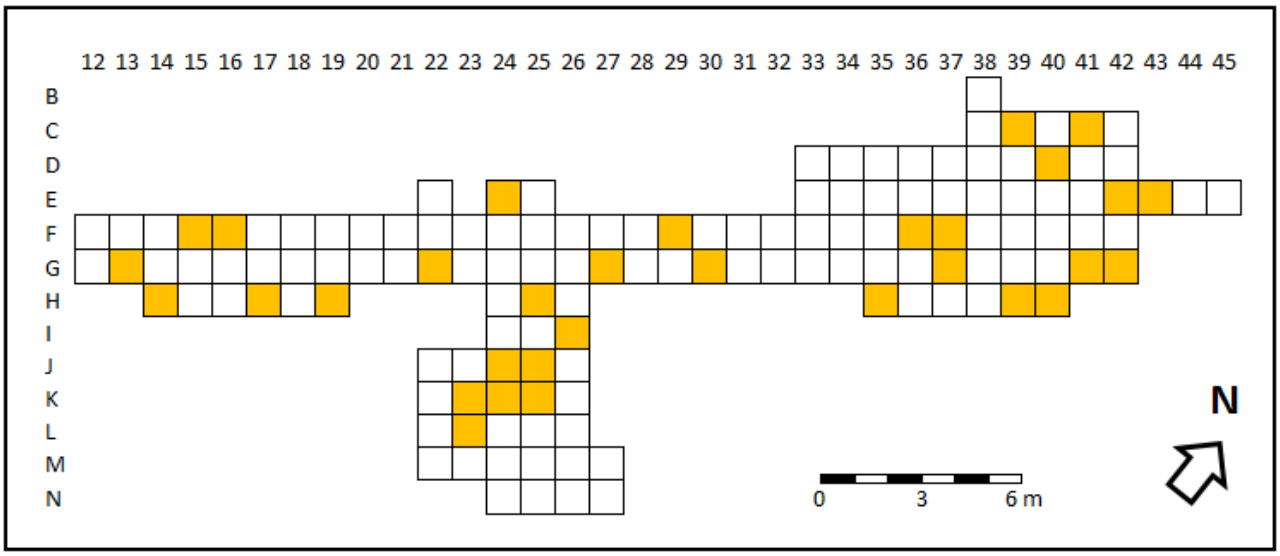


Figure 28: *Plan of HBK2014/014 showing the presence of snail fragments across the site.*

6.2.5. Metal

Sixteen small fragments of rusty metal were found in the northern part of the site (Figures 29 & 30). They were found in a tight cluster and no doubt relate to a metal item that was left there during the 20th century. A British .303 rifle cartridge was also found (Figure 29). It is a Mark VII cartridge, a type introduced in 1910 and commonly used thereafter (Cushman 2001).

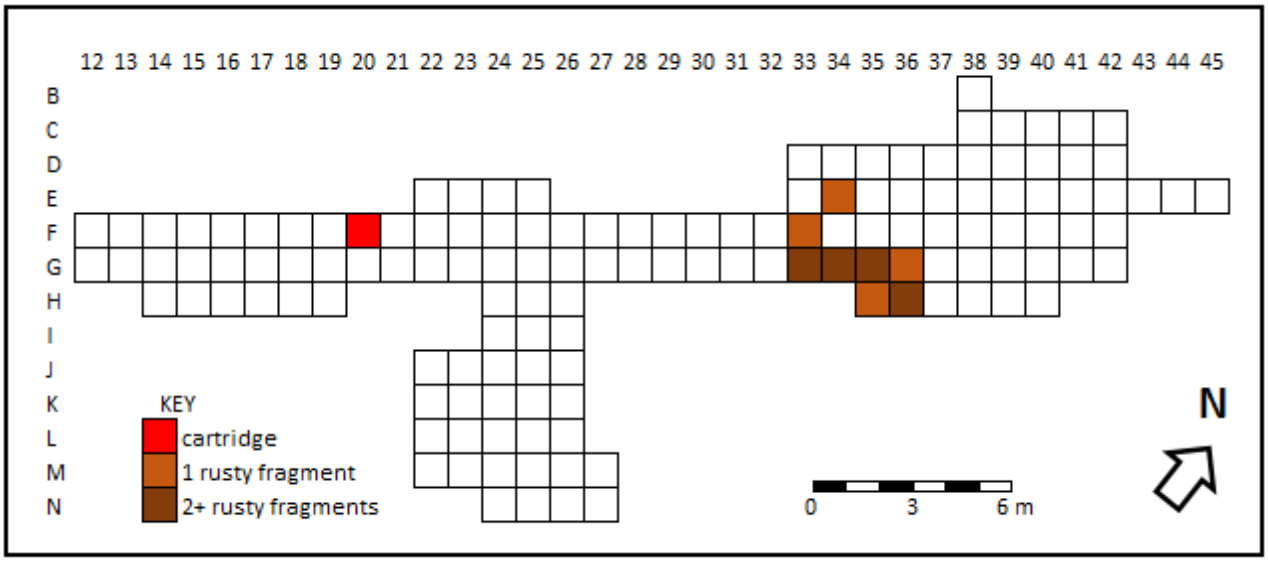


Figure 29: *Plan of HBK2014/014 showing the distribution of metal items across the site.*

Figure 30: *Rusty metal fragments from HBK2014/014. Scale in mm.*

6.2.6. Age of site

The artefacts on this site suggest that different parts of the scatter (approximately to the north and south of the '29' squares) may have been deposited at different times. The northernmost part of the site has many segments (two thirds of all its backed tools) and few scrapers (backed tool to scraper ratio of 9:1) which suggests a likely age between about 6000 and 4000 years ago. The southern parts of the site are dominated by scrapers (backed tool to scraper ratio of 13:34) with side scrapers being particularly dominant. Experience on coastal sites to the north indicates that such assemblages are usually between 3000 and 2000 years old (Orton 2012; Webley & Orton 2013), although the presence of a segment and two backed scrapers could also push it back towards 4000 years ago.

The only material that could be radiocarbon dated is the ostrich eggshell. However, for two reasons it is not worth submitting a sample from this site. Firstly ostriches are known to eat old eggshell fragments and other sources of carbonate that they find lying around in order to build reserves for the production of new eggs. This has the effect of making ages on this material appear far older than they really are, a problem that is more serious the younger the site is. A correction factor has been calculated but the end result is usually a calibrated date with an age range in the order of 1000 years. The second reason is that the location of the fragments right at the edge of the site casts a small amount of doubt on their definite association with the stone artefacts in the hollow.

6.3. HBK2014/015

6.3.1. Excavation details

This site was excavated on 22nd to 24th and 28th to 29th April 2015. A total of 148 m^2 was excavated in 1 m^2 units (Figure 31) using a 1.5 mm sieve throughout. Due to the softness of the sand in this deflation hollow excavation had to proceed to between about 5 cm and 10 cm below the surface across the majority of the site in order to capture all the archaeological material. The site was found to be particularly rich in stone artefacts and representative of a period from which very few archaeological sites survive. Figure 4 above shows a view over the site facing towards the south, while Figures 32 and 33 show the surface appearance of the site. The larger, darker-coloured rocks are the many manuports present on the site, while the smaller, paler items are almost all flaked stone artefacts, largely made from quartz. Although artefact scatter was still present around the edges of the excavated area, it is likely that more than 90% of the stone artefacts were sampled by the excavation.

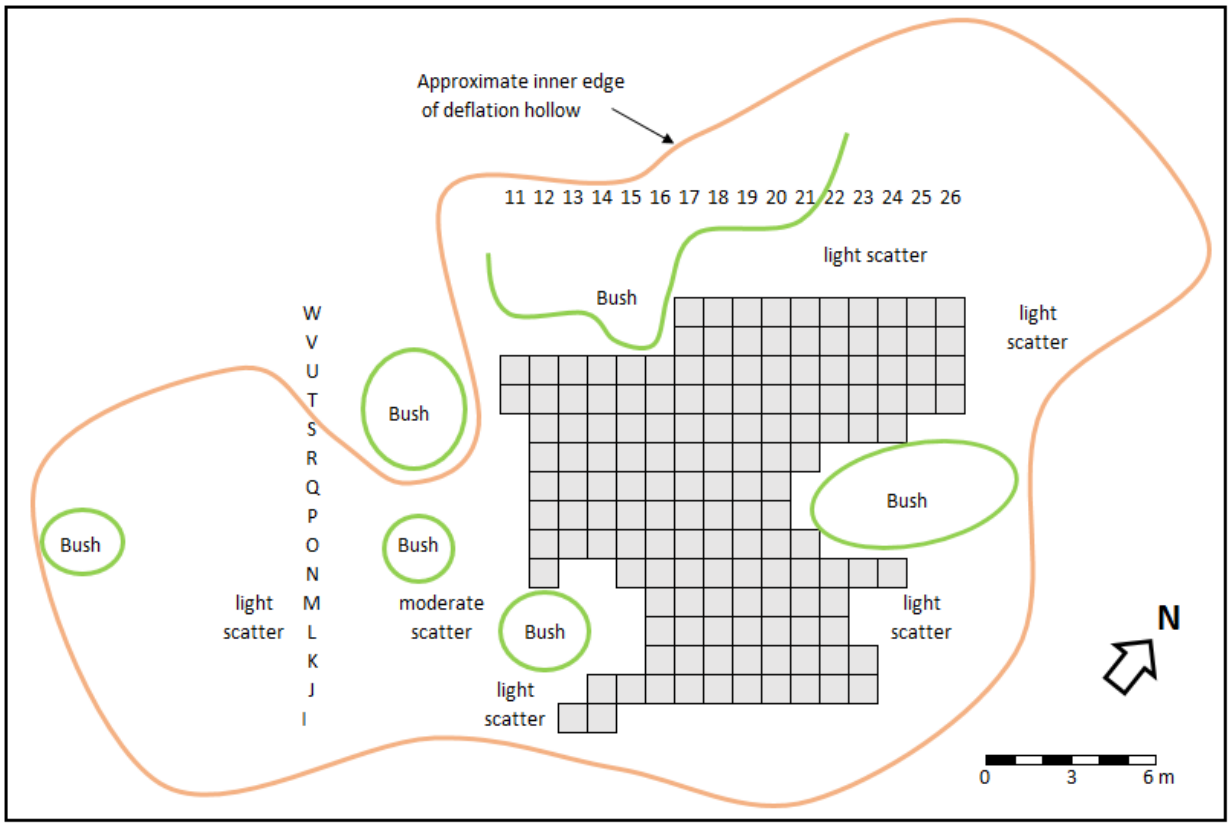


Figure 31: *Plan of site HBK2014/015 showing the location of the excavation within the deflation hollow and the locations of the remaining artefact scatter that was not excavated.*

Figure 32: *View towards the east across the surface of site HBK2014/015 in the vicinity of squares M, N, O 19-20.*

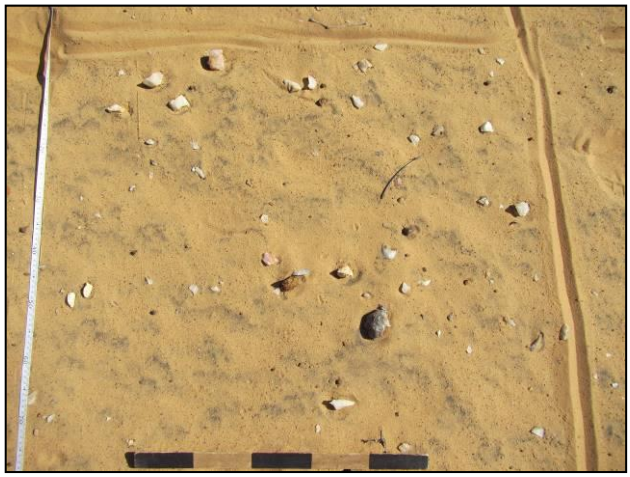


Figure 33: *View of the surface of square N20 with the scale bar lying along the eastern edge.*

During excavation it was noted that the site had very many larger sand grains on its surface. This is not doubt a reflection of a longer period of deflation. Once the surface material was removed, sieving of sand from slightly lower down showed that very few of these larger grains were present. A small test hole was excavated about 30 cm deep in square V22 but only three small artefacts were located and all are assumed to have slumped into the hole during excavation (the soil was very dry).

6.3.2. Stone artefacts

This site produced a very large stone artefact assemblage with a total of 18 574 flaked artefacts (Table 6) as well as four hammer stones (one in quartz, three in quartzite) and one hammer stone/upper grindstone (in 'other'). The artefacts are mostly in quartz with CCS, quartzite and sandstone making up most of the remainder (Table 7). Retouched tools are also mostly in quartz which is not surprising since this material is usually favoured for backed artefacts which dominate here. The overall frequency of retouched pieces was fairly low at 1.03% but this may have been lowered by the very careful sorting which produced an extremely high number of tiny chips (Table 6). The artefacts were spread throughout the deflation hollow but with two clear higher density clusters (Figure 34).

Table 6: *Stone artefacts from HBK2014/015.*

Artefact type	Quartz	CCS	Silcrete	Quartzite	Other
Segment	56	12			
Trapezium	1				
Triangle	2				
Backed bladelet	8	5			
Curve-backed bladelet	2	1	1		
Backed point	18	5			
Truncated bladelet	1	1	1		
Truncated backed point		1			
Backed bladelet fragment	9	3			
Backed flake	6				
Curve-backed flake	2				
Miscellaneous backed piece	4				
Backed piece fragment	28	3			1
Thumbnail scraper		1			
Side scraper	2	2			
Miscellaneous backed scraper	1				
Backed scraper	2	1			
Scraper fragment		1			
Notched piece		1	2		
Notched piece / miscellaneous scraper		1			
Denticulate					
Miscellaneous retouched piece		6		1	
Bipolar core	20	4		1	
Bipolar bladelet core	1	1			
Single platform core	52	15	2	6	1
Single platform bladelet core	2	1			
Radial core					
Irregular core	61	7		10	1
Edge-damaged blade		1			
Edge-damaged bladelet	2	2			
Edge-damaged flake	17	7	1	8	
Edge-damaged chunk					
Blade	29	8	1	8	
Bladelet	482	44	6	56	1
Flake	4524	377	87	890	28
Chunk	1415	180	2	246	7
Chip	8861	371	42	480	10
MSA edge-damaged flake	1				
MSA chunk	3				

Table 7: *Flaked stone materials from HBK2014/015.*

Material	%
Quartz	84.1
CCS	5.7
Silcrete	0.8
Quartzite/sandstone	9.2
Other	0.3

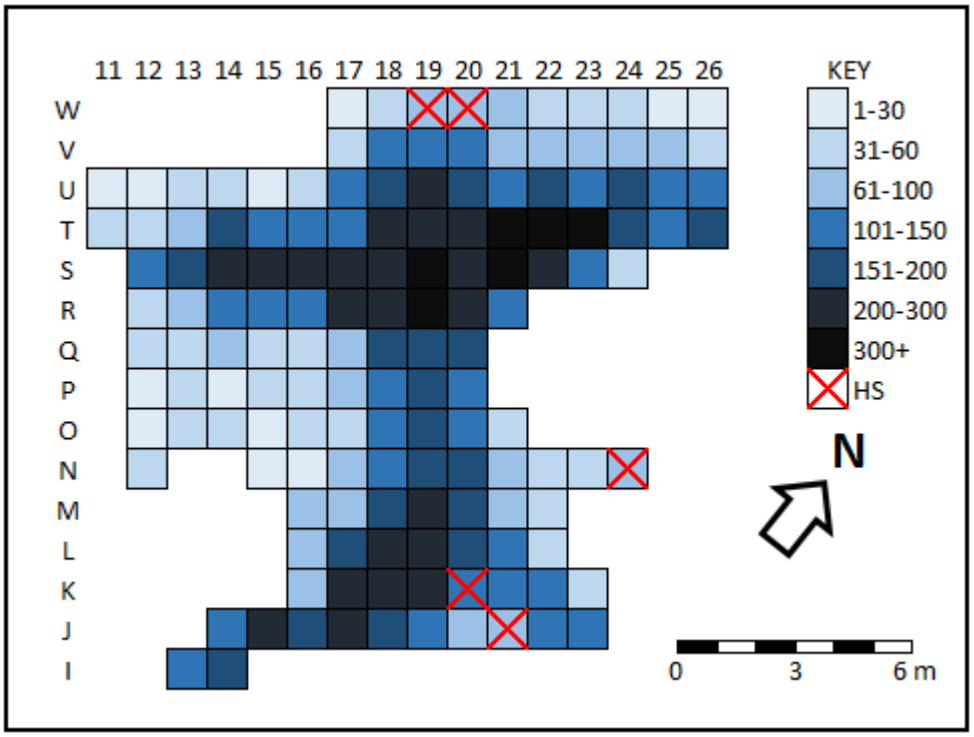


Figure 34: *Plan of HBK2014/015 showing the density of flaked stone artefacts and the location of hammer stones across the site.*

A number of features of the HBK2014/015 lithic assemblage cause it to stand out markedly from most of the other assemblages reported on here:

- The high density of the artefact scatter (Figure 34);
- The large range of retouch types (Table 6);
- The large number of retouched items (Table 6);
- The high ratio of backed tools to scrapers;
- The high frequency of segments in particular (Table 6); and
- The diversity of stone materials (Table 7; Figure 35).

All these characteristics point towards an age in the mid-Holocene and are very strong indicators that the site is likely to predate 4000 years ago. It may well be between 6000 and 5000 years old. The general lack of scrapers also suggests that later reoccupation of the deflation hollow is unlikely to have occurred and that the site does not represent a palimpsest. The ratio of backed tools to scrapers (171:9) very strongly supports an occupation dating before 4000 years ago.

The assemblage was a very interesting one because it also contained a few rather unusual tool forms seldom found in southern Africa. Among these are the trapezium, triangles, curve-backed

artefacts and truncated bladelet tools. The extreme dominance of segments is also interesting and would have been even higher if it were not for breakage; ten of the backed piece fragments were noted during analysis as likely to have been broken segments.

Figure 35: *View of all the stone artefacts from square M18. The scale bar is in 5 mm intervals.*

The site retained good spatial patterning as is clear from Figure 34. A number of other density plots were also produced. CCS and silcrete are generally very good materials for stone artefact manufacture because of their internal properties: they are isotropic and produce good conchoidal fracture. Figure 36 shows the distribution of all artefacts made from CCS. The plan shows that this material was flaked far more frequently in the northern part of the site: more CCS artefacts lie in that area and most of the cores are in that area. Figure 37 indicates the same plan but for silcrete artefacts. It is immediately noticeable that the density is far lower and that there are very few cores. During analysis it was noted that there was a wide variety of colours and textures of silcrete. This variety, the light distribution of artefacts throughout the site, the high ratio of flakes to chips and chunks (Table 8), and the general lack of cores indicates that many of the silcrete artefacts were brought onto the site from elsewhere rather than being produced there. Quartzite, on the other hand and like CCS, was more actively flaked on the site: there are many cores corresponding to the artefact distribution (Figure 38) and the ratio of flakes to chips and chunks is far lower (Table 8). Artefacts in other materials seem to have been largely flaked on site, although the ratio of flakes to chips and chunks is still fairly low (Table 8). Most flaking of this material occurred in the northern part of the site (Figure 39).

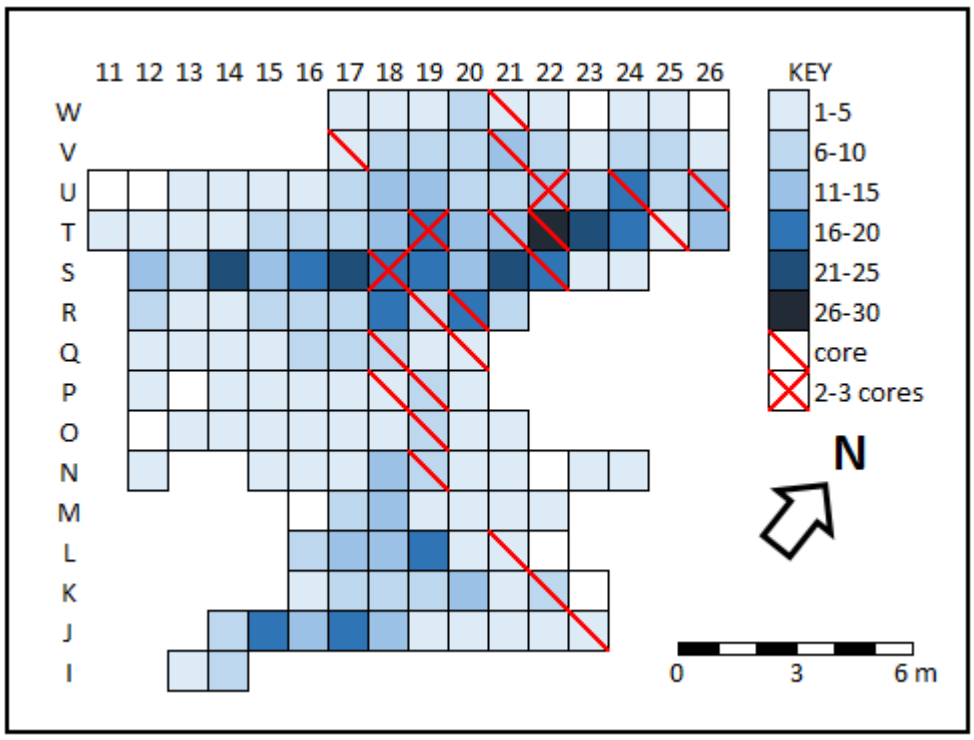


Figure 36: *Plan of HBK2014/015 showing the density of all CCS flaked stone artefacts across the site with the positions of cores marked.*

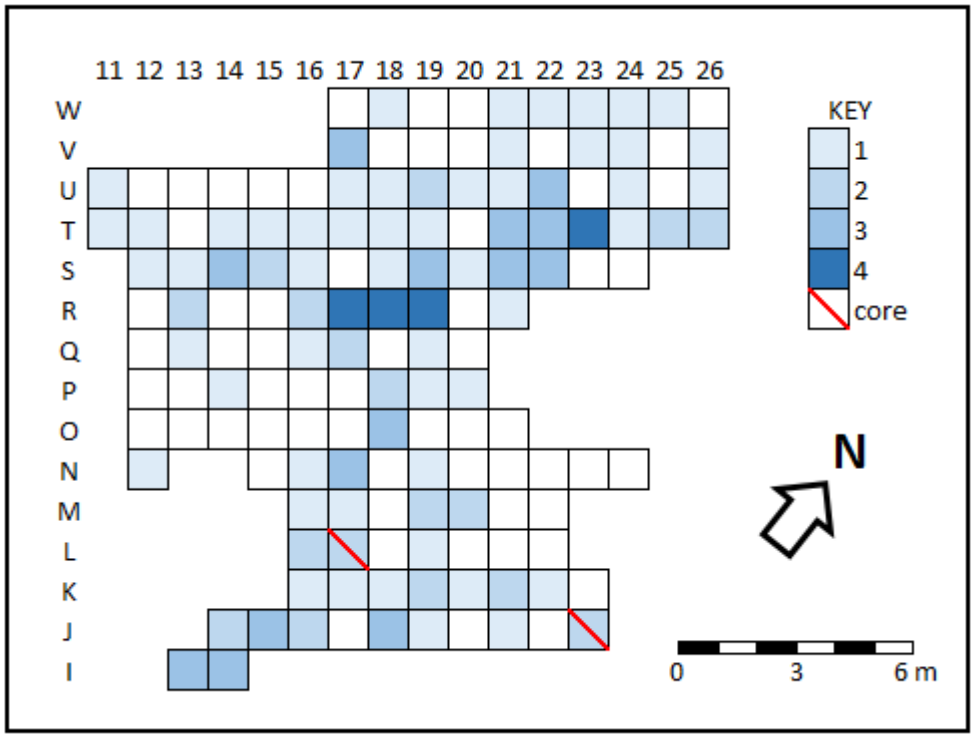


Figure 37: *Plan of HBK2014/015 showing the density of all silcrete flaked stone artefacts across the site with the positions of cores marked.*

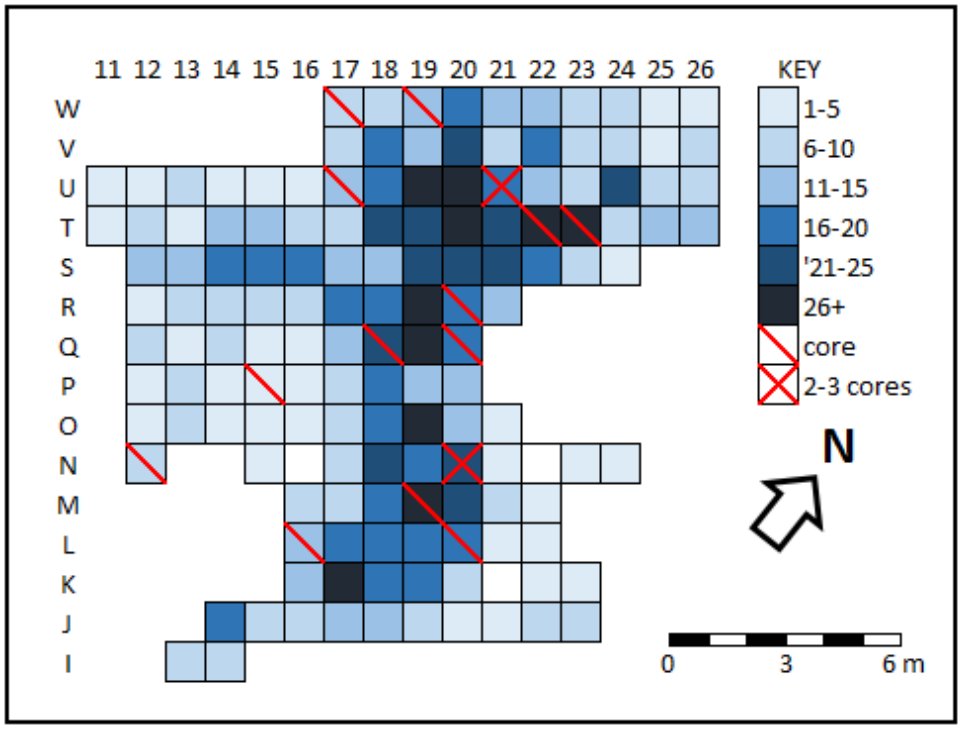


Figure 38: *Plan of HBK2014/015 showing the density of all quartzite flaked stone artefacts across the site with the positions of cores marked.*

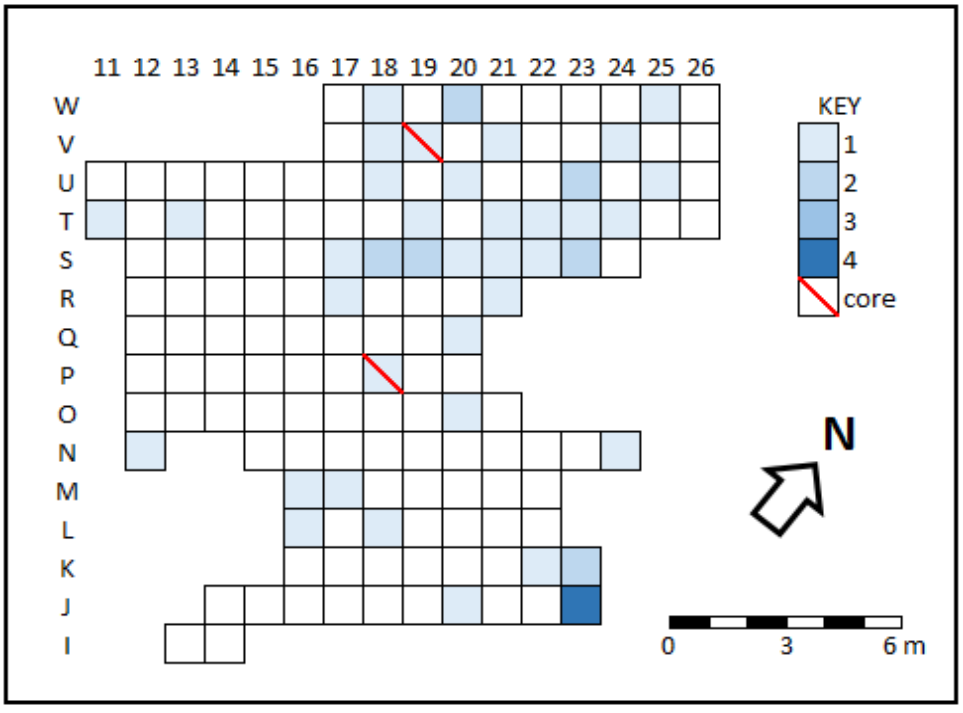


Figure 39: *Plan of HBK2014/015 showing the density of all flaked stone artefacts in other materials across the site with the positions of cores marked.*

These ratios and those of flakes to cores are presented in Table 8. Quartz and CCS were intensively worked on the site and this is evident in the large number of chips and chunks produced relative to flakes. The ratio of flakes and blades to cores shows that quartz cores produced far greater

numbers of flakes than those in CCS. This is no doubt due to the availability of larger lumps of quartz than CCS and the ability of quartz to be worked down to very small cores, usually via the bipolar technique. Silcrete and quartzite are both usually available in larger blocks, although as noted above, the elevated ratio for silcrete is probably largely determined by the number of already made flakes brought to the site. The fact that more blades were produced relative to flakes in CCS than any other material is a reflection on the generally very good quality of this material for flaking.

***Table 8**: Ratios of artefact types. Note that flakes and blades include edge-damaged examples and that blades refers to blades and bladelets.*

	Quartz	CCS	Silcrete	Quartzite/ sandstone	Other
Flakes & blades/chips and chunks	0.49	0.80	2.16	1.33	1.71
Flakes & blades /cores	37.16	15.68	47.50	56.59	14.50
Blades/flakes	0.11	0.14	0.08	0.07	0.04

Unlike HBK2014/014, this site does not show good patterning in the distribution of backed artefacts and scrapers. Both artefact types appear to follow the overall artefact distribution. Plotting backed artefacts in quartz and other materials produces similar distributions; only the quartz distribution is shown (Figure 40). The only slight pattern evident is that quartz scrapers seem to be restricted to the southernmost part of the site (Figure 41).

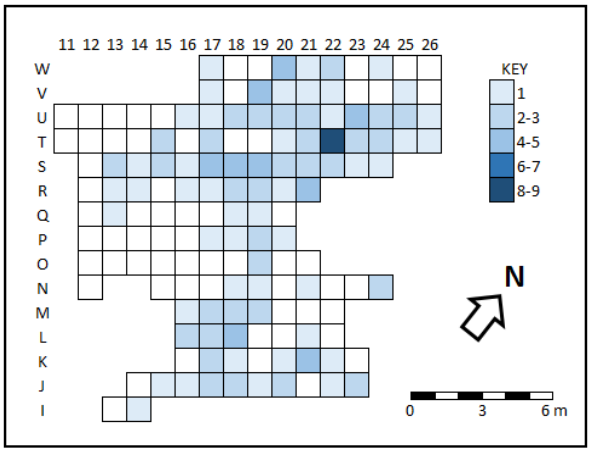


***Figure 40:** Plan of HBK2014/015 showing the density of backed artefacts in all materials across the site.*

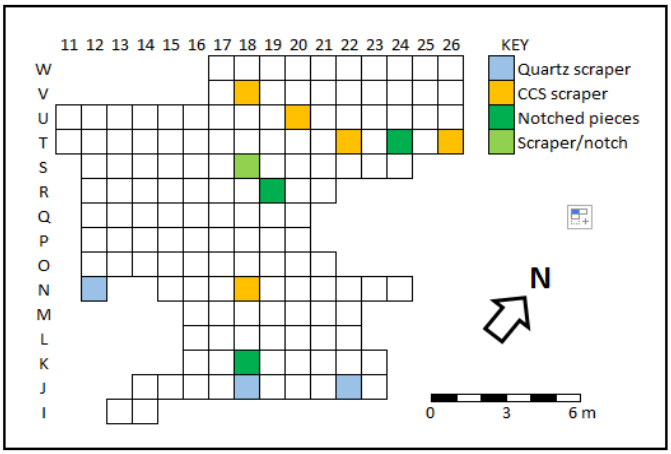


***Figure 41:** Plan of HBK2014/015 showing the density of scrapers and notched pieces across the site. 'Scraper/notch' refers to an artefact with both types of retouched applied to separate edges.*

The great diversity of retouch types has already been noted. This diversity is extremely useful in the study of LSA artefact typology and in understanding more about individual artefact types. An interesting case is that of segments. Although the vast majority are made to a very regular pattern (Figure 42), others were noted to be rather unconventional (Figure 43) suggesting that shape was not always paramount. It is not known whether triangles and trapeziums were simply variants of segments, but this seems highly unlikely given the strongly patterned nature of all three types. Figure 44 shows the single trapezium and two triangles from the site. The trapezium is made by blunting two edges on either end and leaving two parallel unretouched edges in between. The

triangle follows a similar idea but the blunted edges meet at a point opposite the single unretouched edge (Figure 44). The trapezium and one triangle are not perfect examples, but the other triangle is very neatly made and far more typical of the type.

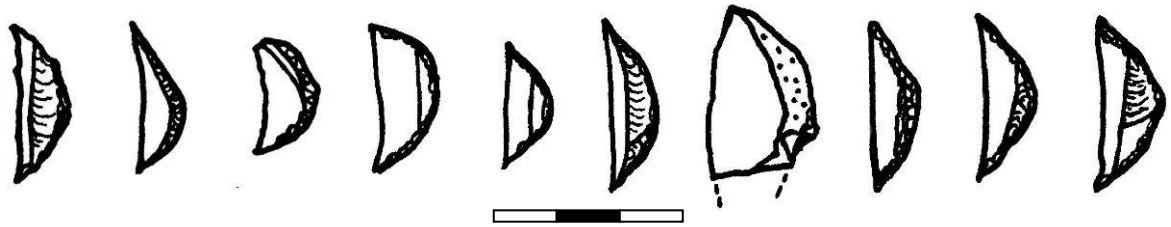


Figure 42: *A series of segments from HBK2014/015 showing the regularity of the pattern to which these artefacts were generally made. The scale bar is in 5 mm intervals. From left to right they originate from the following squares: S16, J17, R16, S20, R21, L18, L17 (lower part broken), N19, T22 and U23. All are in quartz except the last two which are in CCS.*

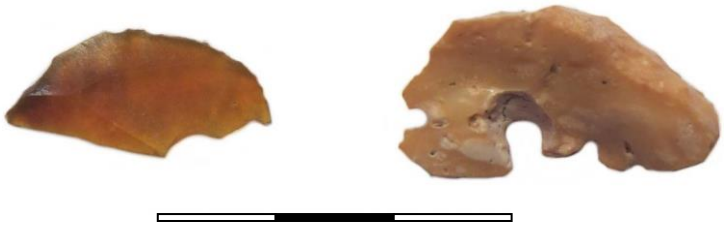


Figure 43: *Two unbroken CCS segments which demonstrate that the chord does not always have to be sharp and straight. Left is from square M16 and the right is from R13. The scale bar is in 5 mm intervals.*

Figure 44: *A trapezium from square S22 and two triangles from squares T22 and V20. All are in quartz. The scale bar is in 5 mm intervals.*

Another common artefact type that is often, but not always, strongly patterned is the backed point. Figure 45 shows two of these artefacts which are made by blunting an edge in such a way that it intersects with the opposing sharp edge to form a point.

Figure 45: *Two unbroken backed points from squares P19 (quartz) and J19 (CCS). The backed edge is along the top in each case. The scale bar is in 5 mm intervals.*

Despite the high degree of formality of the assemblage in terms of its retouched elements, the flaking methods are somewhat intermediate. Bipolar cores are the least formalised cores, although their presence can mask the earlier presence of more formal cores that have eventually been worked out via the bipolar technique. In the quartz component of the assemblage only 15.4% of cores are bipolar. Although many of the retouched tools listed in Table 6 would have been made on bladelets, there are very few bladelet cores present (2.2 % of all quartz cores). This is evident in the relatively scruffy nature of the blades and bladelets (Figure 46) which were obviously not produced via formal blade cores but opportunistically from irregular and single platform cores; very few blades and bladelets have the neatly parallel sides expected of a true bladelet industry.

Figure 46: *The ten bladelets from square R18. The scale bar is in 5 mm intervals.*

Manuports exceeding approximately 5 cm maximum dimension (and that were counted and discarded on site) occurred throughout the deflation hollow. There was no obvious clustering of manuports (Figure 47) and no obvious evidence of their use was present. Some of them may have been fire-cracked, but blackening was absent. As was the case at HBK2014/014, there was much variety amongst the manuports with pieces of flat slabs, rounded cobbles and many angular lumps of rock all occurring on the site (Figure 48). Occasionally some of these angular rocks exhibited evidence of flaking; such items were not recorded as manuports and were retained in the flaked artefact collection. Another category of rock not generally retained in the collection were the very many small ochreous nodules that occur naturally within the local red sand (Figure 49). While some of these may have been collected for use as red pigment, this use seems unlikely. The vast majority of these nodules was not retained, but a few examples that appeared to leave a better streak when tested were kept in the sample.

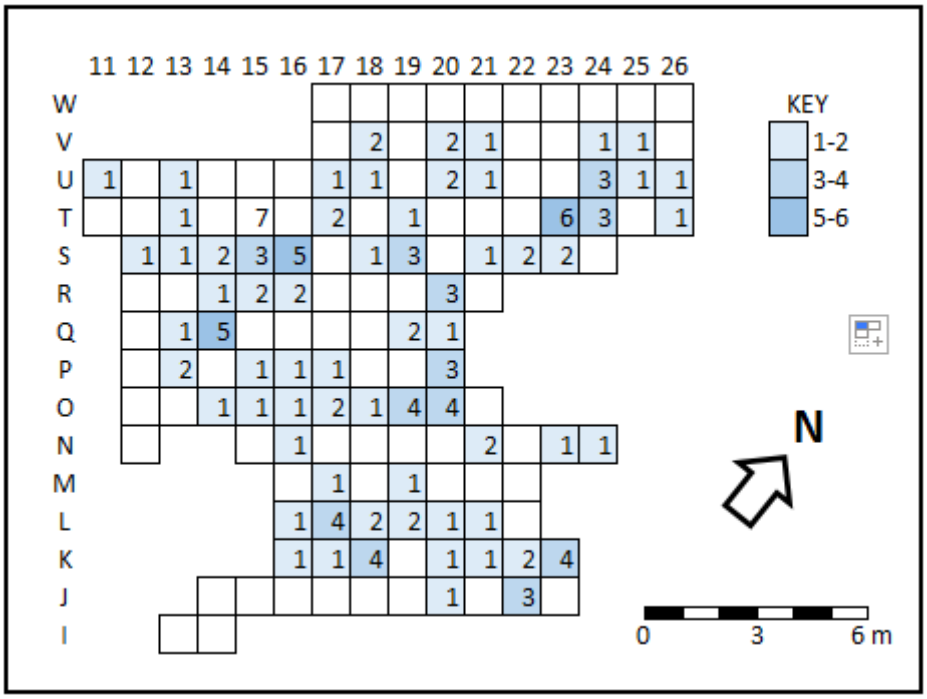


Figure 47: *Plan of HBK2014/015 showing the distribution of manuports of greater than about 5 cm maximum dimension.*

Figure 48: *Manuports discarded on site HBK2014/015. The scale bar is in 10 cm intervals.*

Figure 49: *Examples of ochreous nodules discarded from the HBK2014/015 material during analysis. The scale bar is in 1 mm intervals.*

6.3.3. Bone

A few small fragments of bone and two teeth were found. These appear to be at least partly mineralised but are in generally poor shape. The teeth look too large to be from a small bovid and may be from a small-medium bovid such as a springbok. Figure 50 shows the distribution of bone across the site.

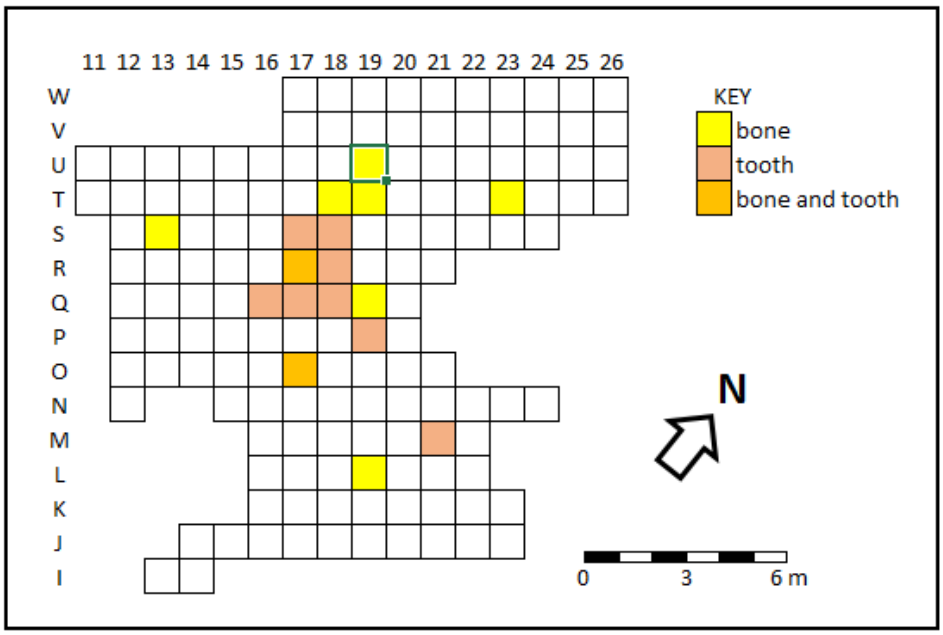


Figure 50: *Plan of HBK2014/015 showing the distribution of bone and tooth fragments across the site.*

6.3.4. Ostrich eggshell

Ten fragments of ostrich eggshell weighing a total of 3.1 g were recorded. These were generally heavily weathered and no doubt relate to the same occupation as the bulk of the stone artefacts. Figure 51 shows their distribution on the site.

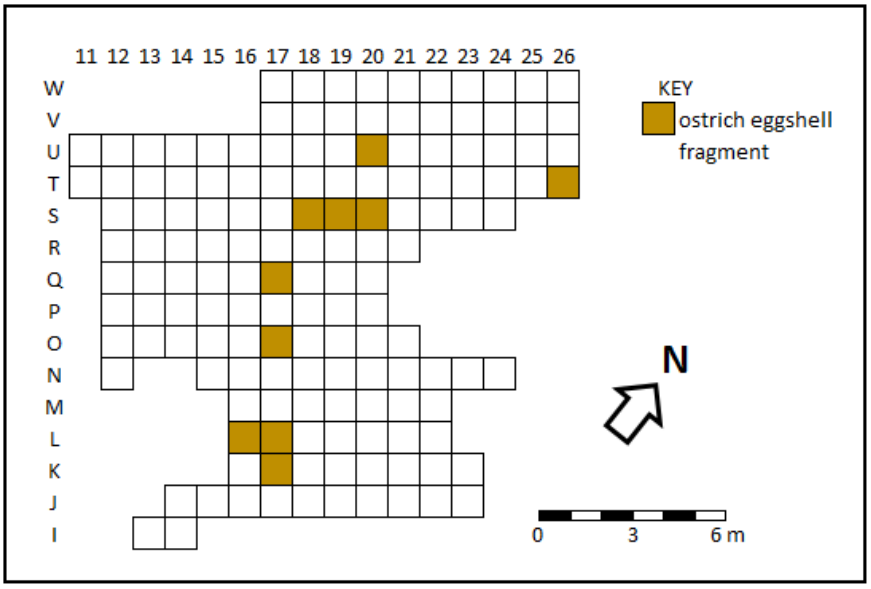


Figure 51: *Plan of HBK2014/015 showing the distribution of ostrich eggshell fragments across the site.*

6.3.5. Marine shell

Marine shell was rare but a few fragments of limpets were noted. In two instances it was evident that the shell species was *Scutellastra argenvillei*, while in a few other cases this species or *Cymbula granatina* may have been present. All in all there were nine shell fragments with a combined weight of 10.4 g. Their distribution is shown in Figure 52.

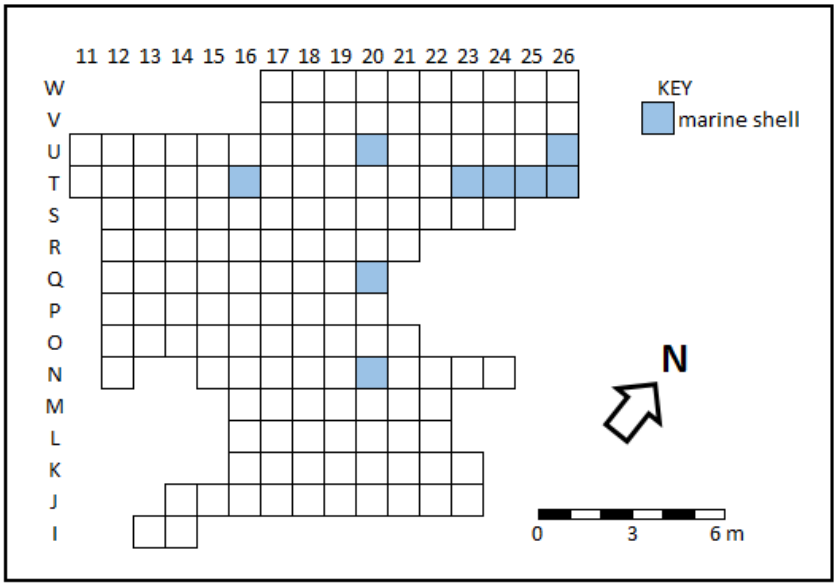


Figure 52: *Plan of HBK2014/015 showing the distribution of marine shell fragments across the site.*

6.3.6. Snail shell

Fragments of snail shell (*Trigonphrus globulus*) were found across the site. Although snails may be associated with archaeological artefacts at some sites as already noted, it seems more likely that those found here relate to natural die-off since there was a mixture of good and bad preservation with some snails retaining the pink colouring that indicates a fresh shell. Although snail shell was retained during excavation, later examination during sorting and the experience of further excavations and analysis revealed the above observations and the shells were not retained.

6.3.7. Age of site

This site is most likely the oldest site excavated as part of this mitigation project. Several aspects of the flaked stone artefact assemblage point towards it being between 6000 and 4000 years old. Firstly and most obviously, segments are abundant across the site. These artefacts are seldom seen in younger sites and when they are present there are extremely few of them. The wide variety of retouched types and of stone materials is also characteristic of mid-Holocene sites. The extreme dominance of backed artefacts over scrapers (ratio of 171:9) also supports this age estimate.

Bone, ostrich eggshell and marine shell can all be used for radiocarbon dating. Bone is one of the best materials for dating but sadly it degenerates fairly rapidly in exposed conditions. Experience on coastal sites to the north has shown that within one or two millennia bone becomes unusable because the component required for dating, the collagen, is too far degenerated and cannot be

successfully extracted from the bone. The demerits of using ostrich eggshell have already been discussed, although for older sites (such as this one) the wide calibrated range is less of a problem and the date will still indicate broadly when the site was occupied. The best material in the present context is the marine shell which, although also requiring a correction because of the apparently older age of sea water, preserves well on exposed sites. Because the site is large, it will be very helpful to determine the likelihood of occupation at widely disparate times. As such, two dates have been proposed for the site. An export permit has been applied for from SAHRA to date a 2.0 g sample of marine shell from square T24 and also a 0.6 g sample of ostrich eggshell (*Struthio camelis*) from square K17. The shell may be *Cymbula granatina* but this is not certain. The ostrich egg fragment is preferred here over marine shell because it is more strongly associated with the southern patch of high density lithics. The nearest marine shell fragment is at the very northern edge of this dense lithic scatter (in square N20) and could relate to the same event that produced the shell from square T24.

6.4. HBK2014/022

6.4.1. Excavation details

This site was excavated on 21st and 22nd April 2015. A total of 55 m^2 was excavated in 1 m^2 units (Figure 53) using a 1.5 mm sieve throughout. Due to the softness of the sand in this deflation hollow excavation had to proceed to between 5 cm and 10 cm below the surface in order to capture all the archaeological material. The excavation collected up the vast majority of the visible artefacts and shells and only a very light scattering of items remained along the western edge of the excavation grid and in a small area at the north-eastern corner. It is likely that at least 80% of the scatter was collected by the excavation. Figure 54 shows the site immediately prior to excavation.

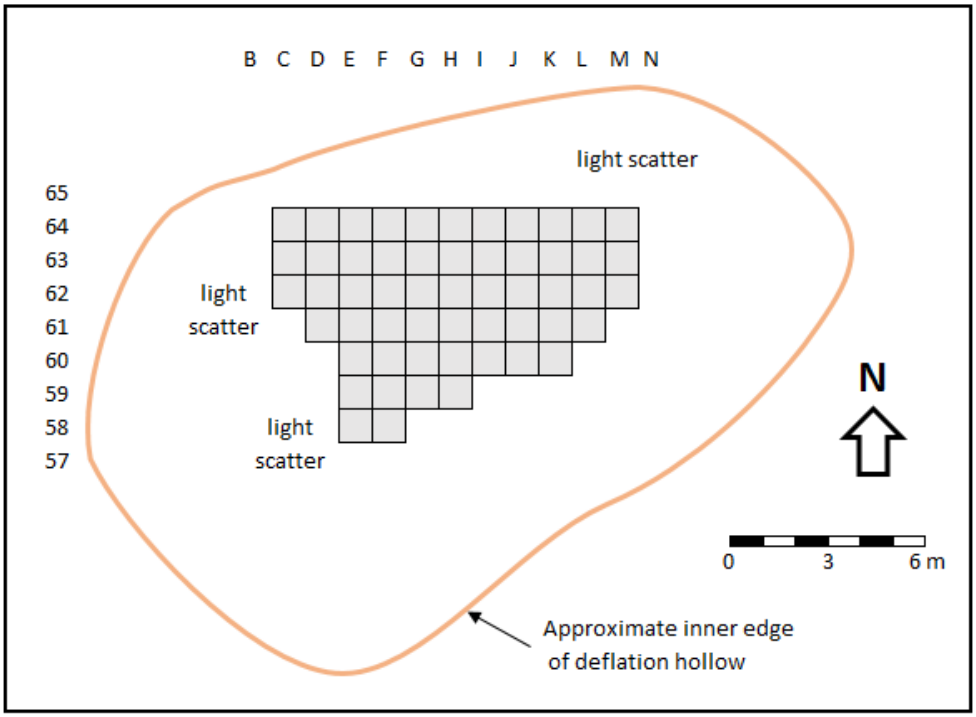


Figure 53: *Plan of site HBK2014/022 showing the location of the excavation within the deflation hollow and the locations of the remaining light artefact scatter that was not excavated.*

Figure 54: *View of site HBK2015/022 facing towards the northeast.*

6.4.2. Stone artefacts

The excavation collected 829 flaked stone artefacts, although 45 of these may not have been intentionally flaked. Five retouched items were found with only one being a scraper; all were in quartz. The segment had both tips broken off but the artefact was clearly segment-shaped. The backed piece fragment was very likely a segment but only half is preserved so this was not guaranteed. Interesting inclusions in the site were two far older artefacts. Both were in quartzite, were far larger than typical LSA artefacts and displayed considerable surface weathering (Figure 55). It is likely that they date to the MSA, or possibly even the ESA. These pieces must have been collected by the LSA people, possibly as potential flaking material, and then left behind in the deflation hollow. One of them in fact had two small, fresh flake scars on it. Quartz dominates the entire assemblage very strongly with quartzite comprising much of the remainder. The flaked assemblage included 45 artefacts that appear to have been formed in the same sort of relatively poor quality quartzite as the manuports on the site (listed as 'quartzite (2) in Tables 9 & 10). These artefacts are assumed to have not been flaked deliberately but to rather have been produced accidentally during use of the rocks as hammer stones or anvils. In contrast, the artefacts listed as 'quartzite (1)' were all in very fine-grained material generally well-suited to flaking.

Table 9: *Stone artefacts from HBK2014/022. Note: "quartzite (1)" refers to flaking quality quartzite, while "quartzite (2)" refers to the coarser-grained material that the manuports consist of.*

Artefact type	Quartz	CCS	Silcrete	Quartzite (1)	Quartzite (2)	Other
Segment	1					
Backed bladelet fragment	1					
Curve-backed bladelet fragment	1					
Backed piece fragment	1					
Side scraper	1					
Bipolar core	2					
Irregular core	6					
Blade	2			3	2	
Bladelet	36		1	2	1	
Flake	206	1		18	25	4
Chunk	52			1	5	
Chip	430			11	12	1
MSA retouched flake				2		

Table 10: *Flaked stone materials from HBK2014/022. See note in Table 9 caption.*

Material	%
Quartz	89.3
CCS	0.1
Silcrete	0.1
Quartzite (1)	4.5
Quartzite (2)	5.4
Other	0.6

Figure 55: *The two surfaces of one of the older, weathered artefacts from HBK2014/022 (square I63). The scale is in 1 cm intervals.*

The flaked stone artefacts were spread across the site but with a few areas of higher concentration (Figure 56) probably indicating areas where flaking was carried out. The locations of the six quartz irregular cores seems to bear this out for the two western patches of artefacts (Figure 57).

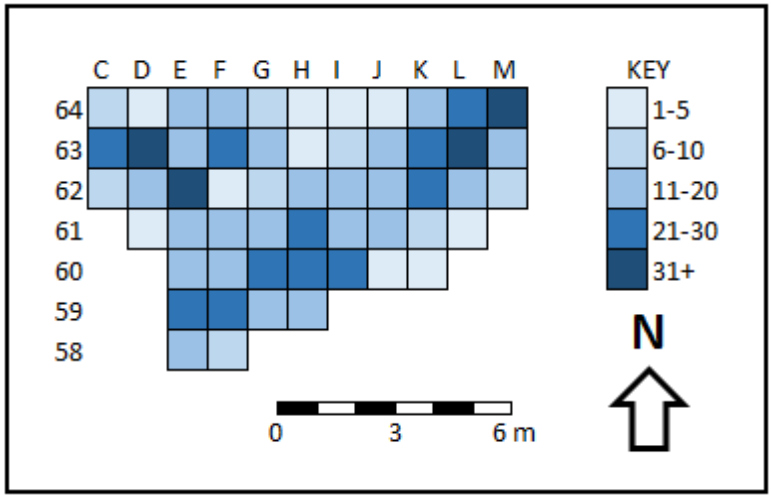


Figure 56: *Plan of HBK2014/022 showing the density of flaked stone artefacts across the site.*

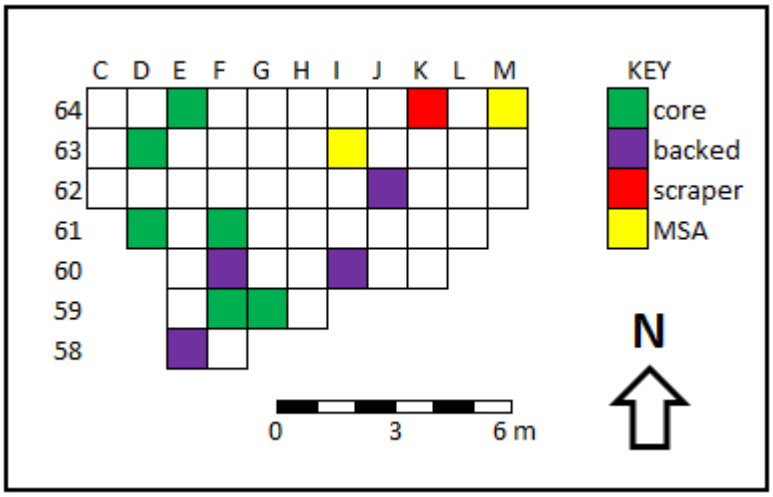


Figure 57: *Plan of HBK2014/022 showing the locations of cores, retouched tools and the two collected ESA/MSA artefacts across the site. All squares contain only one of the relevant item.*

A number of non-artefactual rocks were found on the site. Many of these were larger than about 5 cm maximum dimension and were part of what is assumed to have once been a stone feature (see below). Because of this possibility, all manuports from the site were retained in the collection and quantified during analysis. Figure 58 shows their distribution across the site.

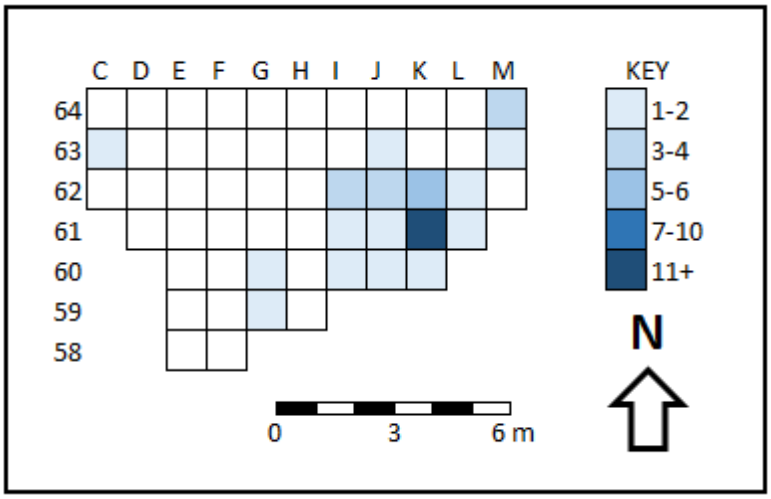


Figure 58: *Plan of HBK2014/022 showing the distribution of manuports.*

6.4.3. Stone feature

A collection of quartzite manuports was found to occur in the western part of the excavation area. There were sixteen stones of greater than about 5 cm maximum dimension (Figure 59) and these are assumed to have, at some stage, formed a stone feature such as a hearth. There was no evidence of burning on the stones and some of them appeared to have had a flake or two removed from them (as noted above) and these have also been included within the flaked assemblage. All the stones are, however, united by their similar appearance and presumably they all originated from a single source. A source for these stones was located in a low-lying area approximately 300 m to the south of the site.

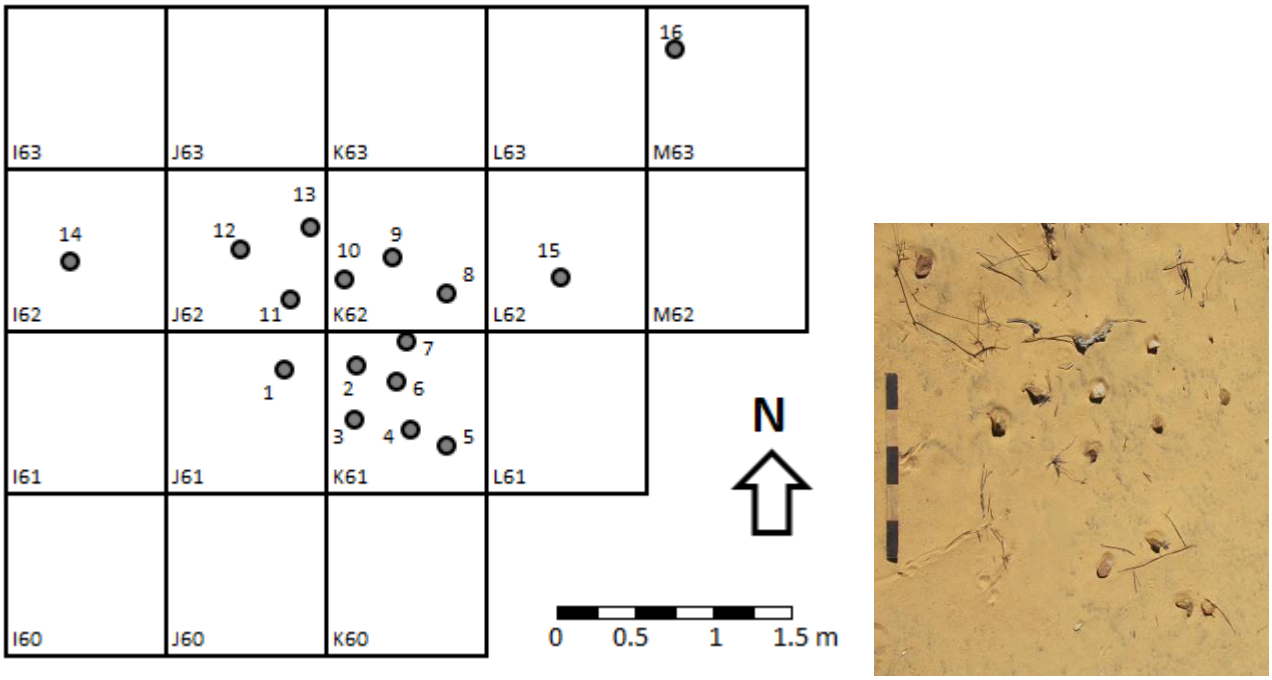


Figure 59: *Plan view of the area in which the stone feature was recorded. Each numbered grey circle denotes a single stone. The locations were plotted by eye without measurement. The photograph shows the surface appearance of the scatter of rocks prior to excavation. The scale bar is 0.5 m long.*

6.4.4. Ostrich eggshell

One tiny fragment of ostrich eggshell weighing 0.1 g was found in square F58.

6.4.5. Marine shell

The site produced 120.9 g of marine shell belonging to three species of limpets (Table 11). There were at least 38 individual shells represented in the very fragmented sample. The shellfish would have been harvested at the coast and carried inland to the site as food. Although loosely scattered across the whole site, the majority of the shell was concentrated in the north-western part of the excavation area where 64.6% of the shell by weight was located in the four densest squares (Figure 60). This dense area coincides with the densest area of flaked stone artefacts.

Table 11: *Marine shell from HBK2014/022.*

Species	**n**	**%**
Cymbula granatina	18	47.4
Scutellastra granularis	4	10.5
Scutellastra argenvillei	10	26.3
Unidentifiable limpets	6	15.8

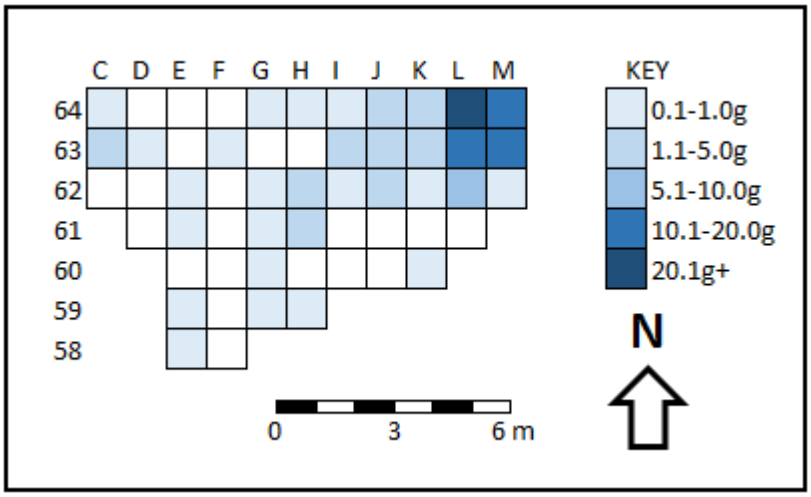


Figure 60: *Plan of HBK2014/022 showing the density of marine shell by weight (g/m^2) across the site.*

6.4.6. Snail shell

Snail shell fragments were found across much of the site but they were absent from the westernmost section (Figure 61). One snail was noted to retain the pink colouring of a fresh shell and all the snail shell is assumed to be natural and not relate to the occupation of the site. All snail shell was, however, retained in the collection.

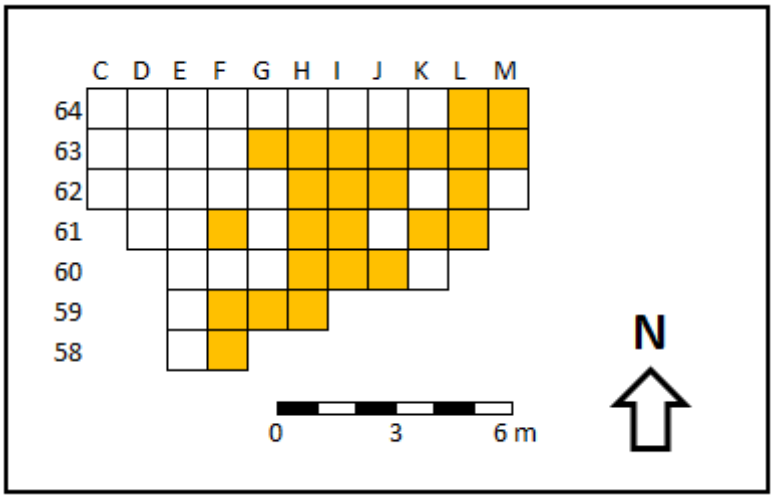


Figure 61: *Plan of HBK2014/022 showing the presence of snail fragments across the site.*

6.4.7. Metal

Squares D63 and G63 each had a single .22 rifle cartridge in them. Both their head stamps displayed the letters “HI SPEED” and “U”. These likely date to the mid- to late-20th century.

6.4.8. Age of site

With such a small selection of retouched items it is difficult to be confident of the age of this site. However, the segment (or possibly two) and the high ratio of backed tools to scrapers (4:1) support an age in the mid-Holocene. However, the very low frequencies of CCS and silcrete in the assemblage confuses the matter since these materials would be expected to feature more strongly in mid-Holocene assemblages.

The marine shell is the only material available for radiocarbon dating and a permit application has been lodged with SAHRA for export of a 4.4 g fragment of marine shell (*Cymbula granatina*) from square L63.

6.5. HKB2014/030

6.5.1. Excavation details

This site was excavated on 21st April 2015. A total of 59 m^2 was excavated in 1 m^2 units (Figure 62) using a 1.5 mm sieve throughout. The archaeological material was found to be located above a firm subsurface level and only about 3 cm of sand had to be removed in order to capture all the material. The densest part of the scatter was collected by the formal excavation, but a far lighter scattering of archaeological material was still present along the northern and eastern edges of the excavation grid. Some of this material was collected as surface collection after the formal excavation was completed. This latter material included a handful of whole *Scutellastra argenvillei* shells located partly up the slope near the northern rim of the deflation hollow. Approximately 70% of the available archaeological material was excavated, although it is unknown how far the site might have extended towards the south prior to construction of the mine road (Figure 63). Figure 64 shows the surface appearance of the site prior to excavation.

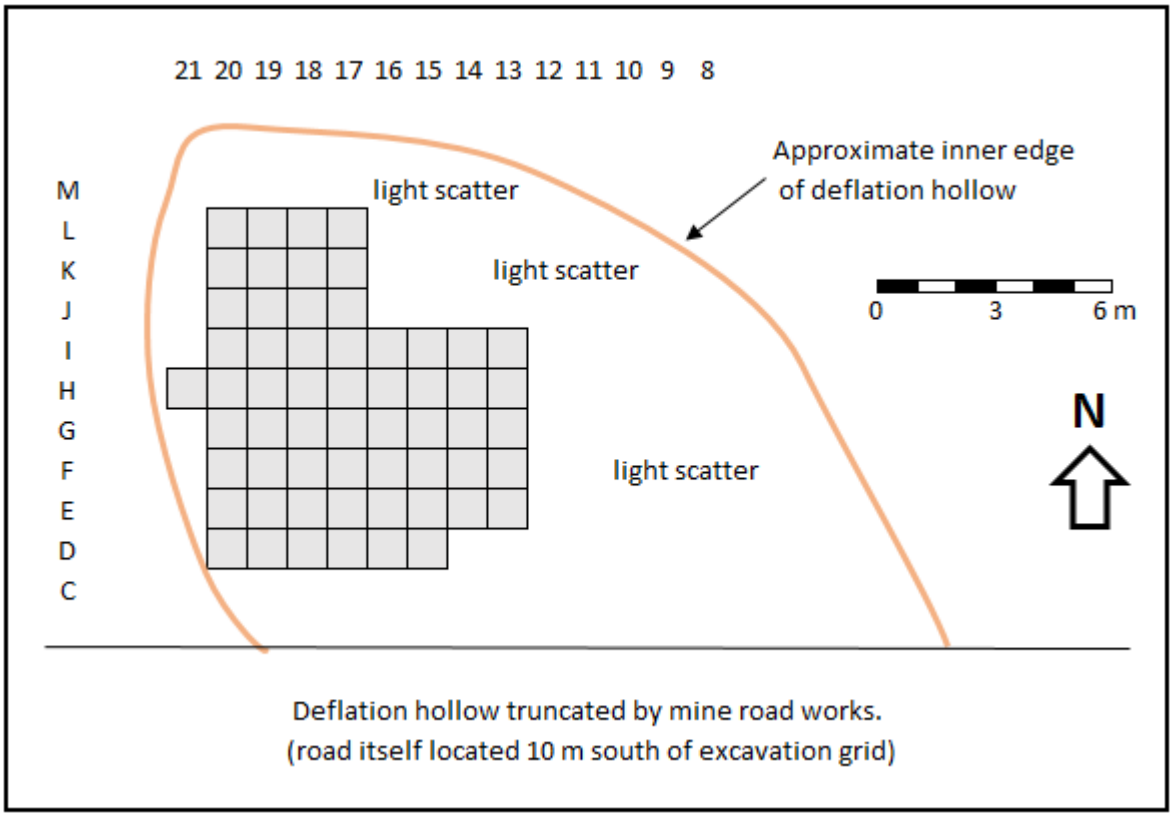


Figure 62: *Plan of site HBK2014/030 showing the location of the excavation within the deflation hollow and the location of the unexcavated light scatter that was partially collected after excavation.*

Figure 63: *View towards the south over site HBK2014/030 showing the truncation of the deflation by the mine road in the background.*

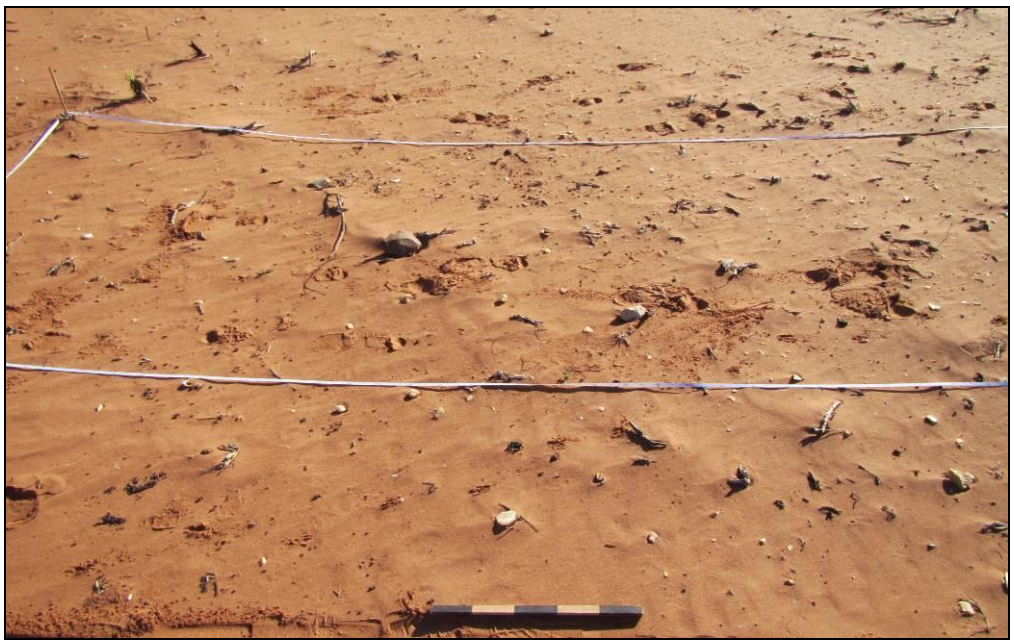


Figure 64: *View towards the north of part of the surface of the site in the vicinity of square I17 prior to its excavation.*

6.5.2. Stone artefacts

The site produced 461 flaked artefacts and one hammer stone from the excavation area (Table 12), while a further 29 flaked artefacts were collected from the surface to the north and northeast of the grid. The majority of artefacts were of quartz, but quartzite played a significant role as well (Table 13). On the whole the assemblage was unremarkable and it is possible that there are artefacts of varying age included – some were lightly wind abraded, while others appeared fresher. Excluded from these lightly abraded artefacts are five obviously far older quartz artefacts assumed to be from the MSA (Table 12). These artefacts may have been collected and brought to the site during the LSA, or they could be on the surface as a result of bioturbation. The same sort of artefacts are evident lying on the hard surface below the cover sands (these are visible on the floor of the mined areas). Another far older quartzite artefact was one that clearly was collected and then reused. Its LSA type is an irregular core but it might have originally been an ESA hand-axe that was only partly made (Figure 65).

Table 12: *Stone artefacts from HBK2014/030 (excavated sample only).*

Artefact type	Quartz	Quartzite	Other
Backed bladelet	1		
Single platform core		1	
Irregular core	5	1	
Edge-damaged flake		1	
Blade		1	
Bladelet	11	1	
Flake	119	93	3
Chunk	45	16	
Chip	143	14	1
MSA flake	4		
MSA chunk	1		
Hammer stone	1		

Table 13: *Flaked stone materials from HBK2014/014 (excavated sample only).*

Material	%
Quartz	71.4
Quartzite	27.8
Other	0.9

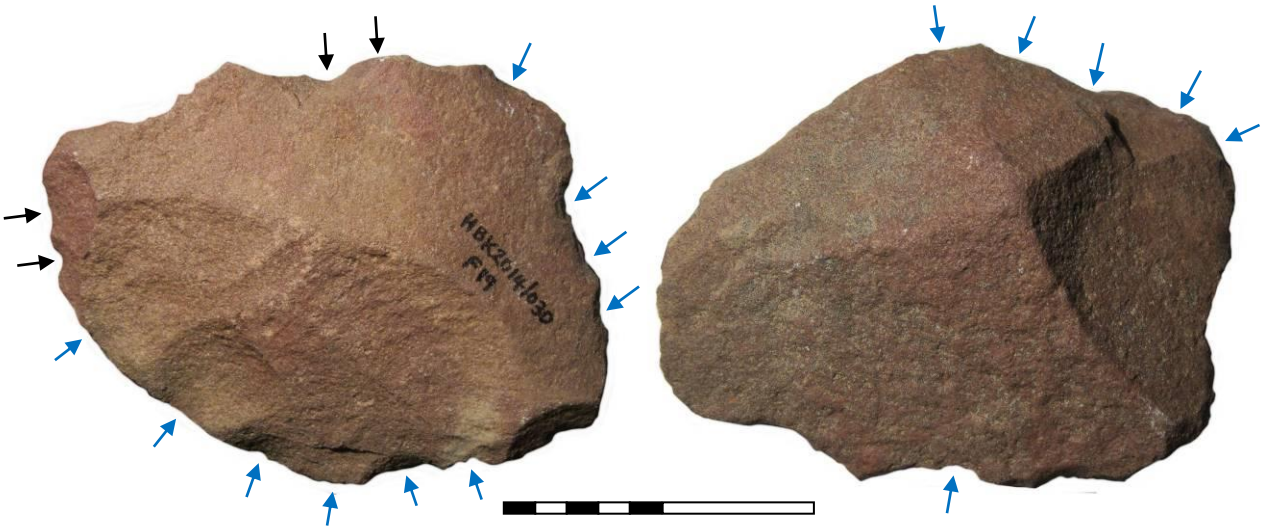


Figure 65: *The two sides of the presumed ESA artefact that was collected and reflaked. The blue arrows indicate the positions from which flakes were struck during the earlier period (when the original artefact was made), while the black arrows mark recent flake removals. The scale bar is 10 cm long.*

The stone artefacts lie across the entire excavated area but there was a very strong concentration in one area. The single retouched tool, a backed bladelet, and a hammer stone were found alongside this cluster (Figure 66).

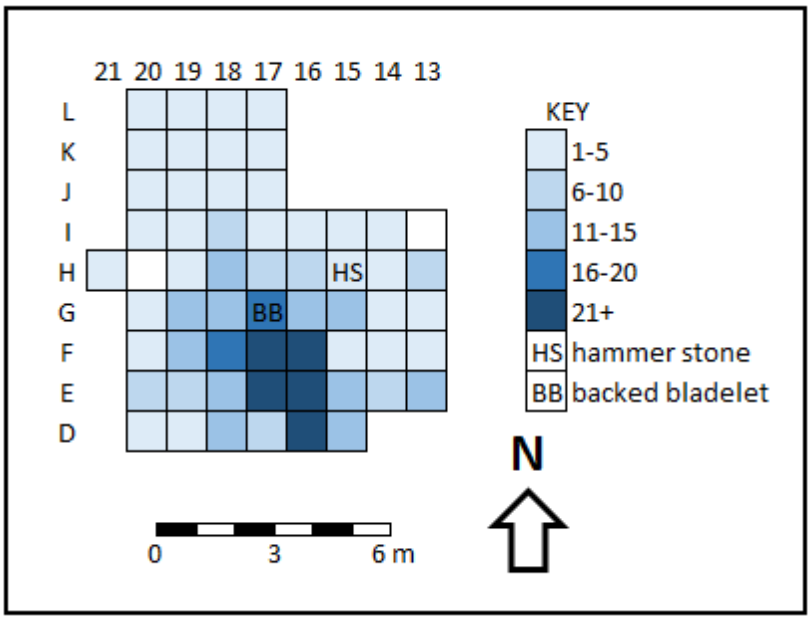


Figure 66: *Plan of HBK2014/030 showing the density of flaked stone artefacts across the site.*

6.5.3. Marine shell

Marine shell fragments with a combined weight of 410.9 g were found across the site. They were almost all limpets, although two fragments of whelk were noted. Table 14 reflects the countable individuals and shows that the sample is strongly dominated by one species, *Cymbula granatina*. Although *Scutellastra barbara* and whelk were noted on the site, there were no countable individuals. Figure 67 shows the shellfish distribution by weight across the site. There are areas of slight concentration but overall it seems that there was too little shell introduced to the site o have created a proper dump area. Also, subsequent wind action has likely moved some of the smaller fragments around to some degree.

Table 14: *Marine shell from HBK2014/022.*

Species	n	%
Cymbula granatina	43	75.4
Scutellastra granularis	1	1.8
Scutellastra argenvillei	7	12.3
Scutellastra Barbara	-	-
Unidentifiable limpets	6	10.5
Whelk	-	-

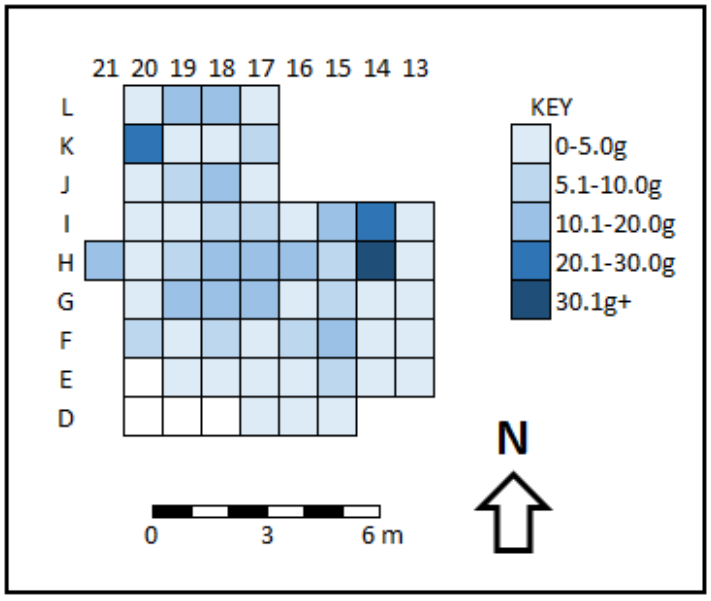


Figure 67: *Plan of HBK2014/030 showing the density of marine shell by weight (g/m^2) across the site.*

6.5.4. Bone

The most common bones on the site were those of a micromammal. The bones were spread across much of the site (Figure 68) and are assumed to belong to a single individual and are likely, based on the relative freshness of the bones, to relate to a recent rodent death. There were a number of other small bone fragments on the site, but the vast majority were extremely poorly preserved and had a crumbly, powdery consistency. These bones may or may not relate to the LSA occupation of the hollow. Two other fragments were better preserved and may relate to the occupation. Aside from the micromammal bones, none of the other fragments was diagnostic.

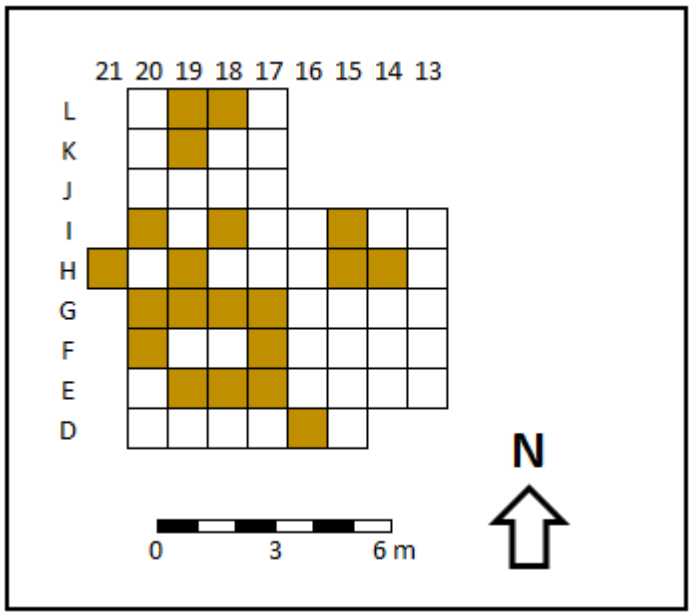


Figure 68: *Plan of HBK2014/030 showing the presence of micromammal bones across the site.*

6.5.5. Snail shell

Snail shell (*Trigonephrus globulus*) fragments were found throughout the site with less on the more sloping parts towards the edges of the hollow (to the north and west in Figure 69). Although they are now considered non-archaeological, they were retained in the collection.

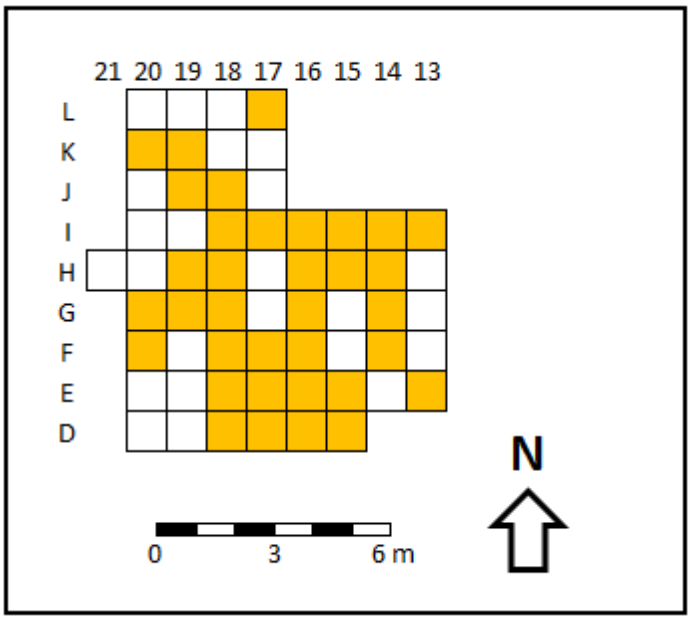


Figure 69: *Plan of HBK2014/030 showing the presence of snail fragments across the site.*

6.5.6. Age of site

The stone artefacts from this site do not indicate an obvious age but it seems probable that the site is less than 2100 years old. The large amount of quartzite suggests a less formalised industry

which, along the Namaqualand coastline, is usually more common on sites dating within the last 1500 years (Orton 2012). The single quartz backed tool is very little to go on and 'Group 3' sites (*sensu* Orton 2012) usually have an extreme dominance of quartz. It is also possible that the assemblage is mixed.

The bones are either poorly preserved or of variable age and do not present a reliable dating material. The shellfish is more reliable but overall the site is insufficiently interesting to justify a radiocarbon date.

6.6. HBK2014/031

6.6.1. Excavation details

This site was excavated on 21st April 2015. A total of 28 m^2 was excavated in 1 m^2 units (Figure 70) using a 1.5 mm sieve throughout. The sand was fairly loose with no obvious hard surface below. However, the archaeological material was found to be located within the upper 5 cm of sand. It is estimated that about 70% of the visible archaeological scatter was excavated, while a selection of the remaining artefacts from the southern and eastern edge of the grid was collected from the surface. Figure 71 shows the deflation hollow in which the site was located.

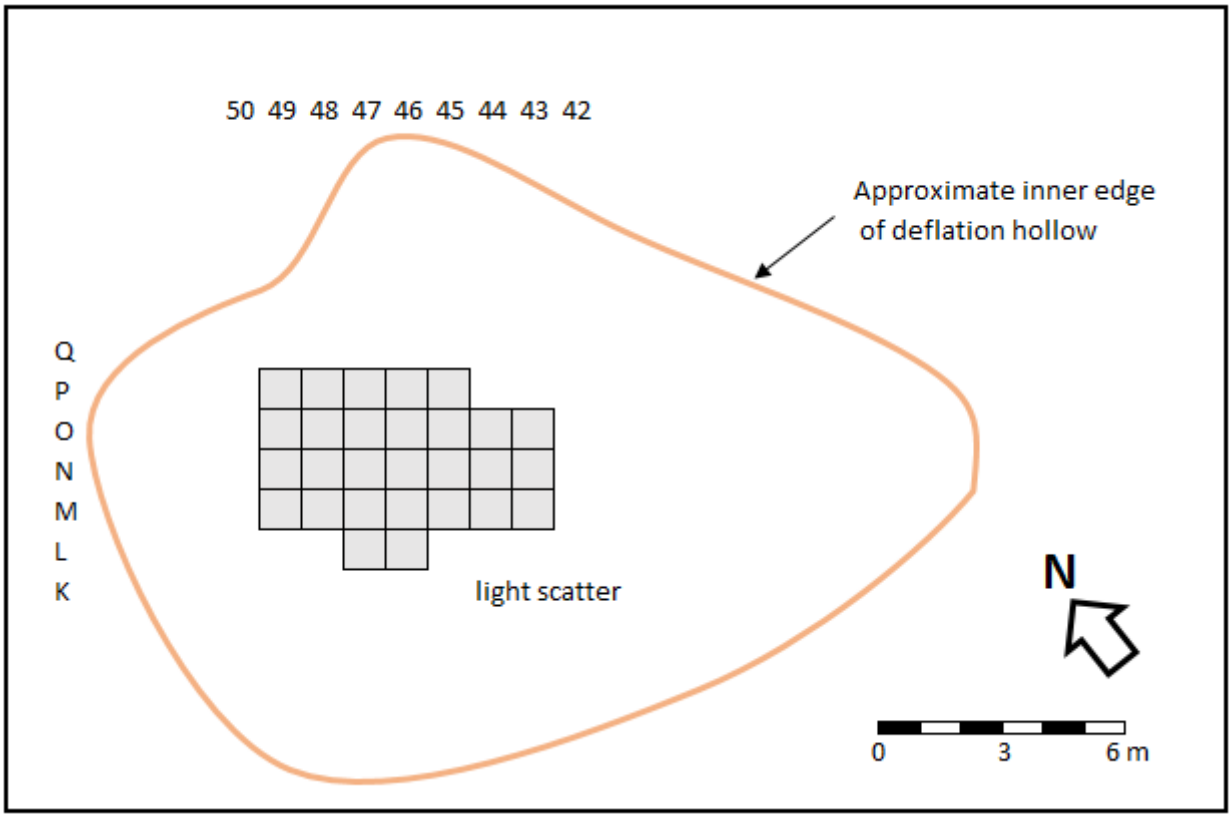


Figure 70: *Plan of site HBK2014/031 showing the location of the excavation within the deflation hollow and the location of the unexcavated light scatter that was partially collected after excavation.*

Figure 71: *View of site HBK2014/031 facing towards the southwest just before commencement of excavation.*

6.6.2. Stone artefacts

A small collection of 227 flaked stone artefacts was obtained from the excavation (Table 14), while a further 35 were collected from the surface around the south-eastern side of the excavation area (these are excluded from the tabulated data). Unusually, quartzite dominated the assemblage with most of the remaining artefacts being in quartz (Table 15). Although silcrete was absent from the excavation area, a single silcrete flake was included in the surface collection. Most artefacts were located in the southern part of the site (Figure 72) One retouched artefact was recovered. This was a curve-backed flake in quartz from square L47. A quartzite large chopper was found in square N44 (Figure 73). It started out as an unmodified quartzite block which was then heavily used on both of its ends, as well as being hammered on one side. The ends have had pieces of rock flake away from them because of the repeated impacts, while the third impact point has only become badly bruised. Also of interest is a quartzite single platform core that was made on a large flake (Figure 74). It could also have been classified as an edge-damaged flake, but the size of the removals suggests that they were deliberate and that the artefact is a core. Amongst the surface collection artefacts there was a large edge-damaged quartzite flake that was very heavily worn suggesting that it was a much older artefact collected by the LSA people, possibly as stone material for flaking.

Table 14: *Stone artefacts from HBK2014/031 (excavated sample only).*

Artefact type	Quartz	CCS	Quartzite
Curve-backed flake	1		
Large chopper			1
Single platform core			1
Bladelet	2		3
Flake	29	1	79
Chunk	6		22
Chip	53		29

Table 15: *Flaked stone materials from HBK2014/031 (excavated sample only).*

Material	%
Quartz	40.1
CCS	0.4
Quartzite	59.5

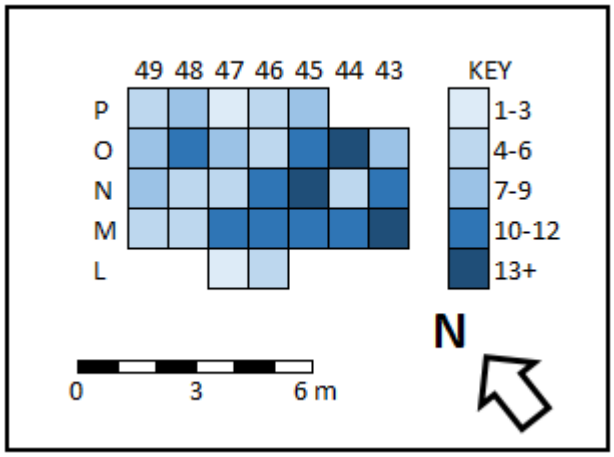


Figure 72: *Plan of HBK2014/031 showing the density of flaked stone artefacts across the site.*

Figure 73: *Quartzite large chopper showing the points of use where fresh damage is evident. (arrowed). Scale in 1 cm intervals.*

Figure 74: *Quartzite single platform core made on a large flake. Scale in 1 cm intervals. The new flakes were removed from the lower right hand edge in this view. Scale in 1 cm intervals.*

6.6.3. Marine shell

A single small fragment of a limpet shell (possibly *Scutellastra granularis*) was recovered from square L47.

6.6.4. Bone

A few tiny fragments of a micromammal mandible were found in square M46. The bone is assumed to be recent and to relate to natural mortality.

6.6.5. Snail shell

Fragments of snail shell (*Trigonephrus globulus*) were found throughout the site (Figure 75). Although they are now assumed to be natural, they were all collected during excavation and they have been retained in the collection.

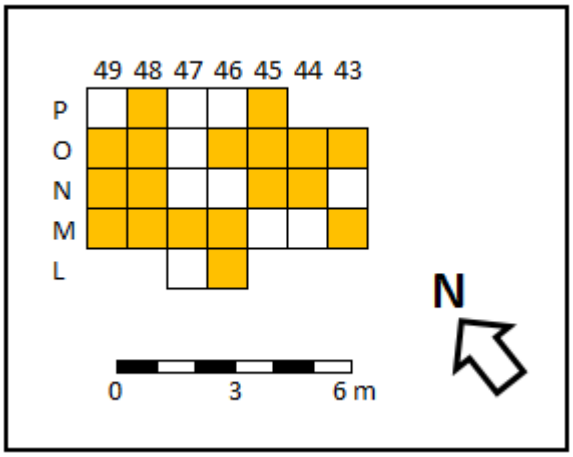


Figure 75: *Plan of HBK2014/031 showing the presence of snail fragments across the site.*

6.6.6. Age of site

The stone artefact assemblage is dominated by quartzite. This is an unusual signature and probably reflects a recent occupation, certainly within the last 2100 years and possibly within the last 1000 years. The only dateable material is a single small fragment of marine shell. Overall, however, the site does not present sufficient interest to merit a radiocarbon date.

6.7. HBK2014/034

6.7.1. Excavation details

This small site was excavated on 24th April 2015. A total area of 16.5 m^2 was excavated in 1 m^2 units (Figure 76) using a 1.5 mm sieve throughout. The sand was fairly loose with no obvious hard surface below. The archaeological artefacts were spread throughout approximately the upper 10 cm worth of deposit. The site appears to have been a small, short term camp site that took advantage of a space between bushes (Figure 77) rather than being in a deflation hollow like the other sites in the area. It is located on the south-eastern side of a long, low dune ridge. Most of the site was excavated with only a few shell fragments still visible amongst the bushes surrounding the site. It is, however, likely that the archaeological material extends slightly under the bushes to the west of the excavation.

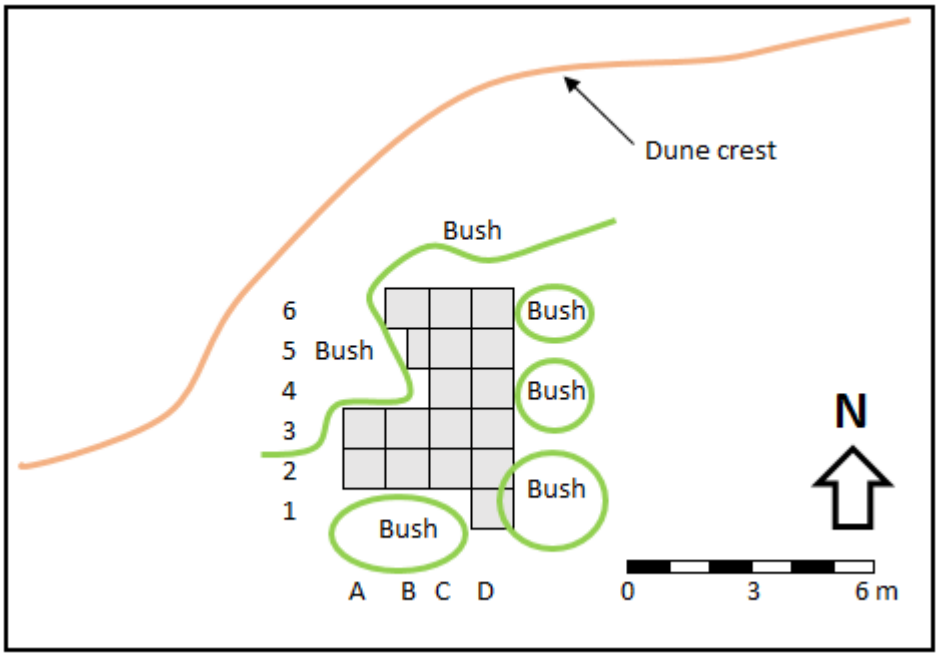


Figure 76: *Plan of site HBK2014/034 showing the location of the excavation to the southeast of a dune ridge.*

Figure 77: *View towards the southwest over the small space between bushes that was occupied by site HBK2014/034. The scale bar in the centr4e of the photograph is 0.5 m long.*

6.7.2. Stone artefacts

There were 484 flaked stone artefacts from the small excavation, but the vast majority (68.6%) were chips (Tables 16). The artefacts were mostly of quartz but some CCS and quartzite was also present (Tables 17). Five retouched items were found with four of them being in CCS. Backed tools are more frequently found to be in quartz and scrapers in CCS with this site demonstrating that pattern clearly. A single broken adze was present; these tools are generally thought to have been used in woodworking and are uncommon in Namaqualand Sandveld assemblages. Adzes have a

steep working edge characterised by step-flaking, while the under surface typically bears irregular small flake scars that have resulted from use as is to be seen on the example from this site (Figure 78).

Table 16: *Stone artefacts from HBK2014/034.*

Artefact type	Quartz	Silcrete	CCS	Quartzite
Backed bladelet	1			
Side scraper			2	
Scraper fragment			1	
Adze			1	
Bipolar core	1			
Single platform core	1			
Irregular core	2			1
Blade	1			
Bladelet	8		1	
Flake	81	1	3	25
Chunk	18			4
Chip	319		7	6

Table 17: *Flaked stone materials from HBK2014/034.*

Material	%
Quartz	89.3
Silcrete	0.2
CCS	3.1
Quartzite	7.4

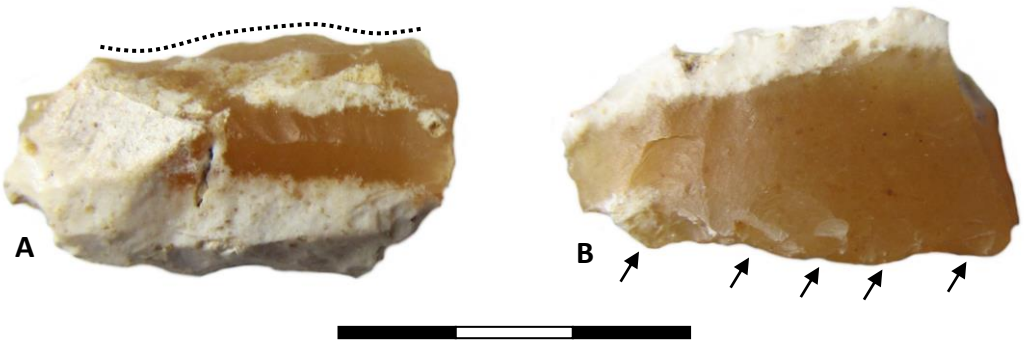


Figure 78: *Photographs of the dorsal (A) and ventral (B) surfaces of the adze from HBK2014/034. On the dorsal surface the dotted line runs adjacent to the retouched edge, while on the ventral surface the arrows indicate the irregular scarring that typically occurs from heavy use. The right hand side of the artefact is a break. The scale is in 5 mm intervals.*

The flaked stone artefacts were located right across the site but seemed to be focused on the central area, likely extending beneath the bush and small dune that limited excavation towards the west (Figure 79). The retouched tools and cores, however, seemed to lie more towards the east, possibly suggesting a work area east of a small midden (Figures 80 & 81).

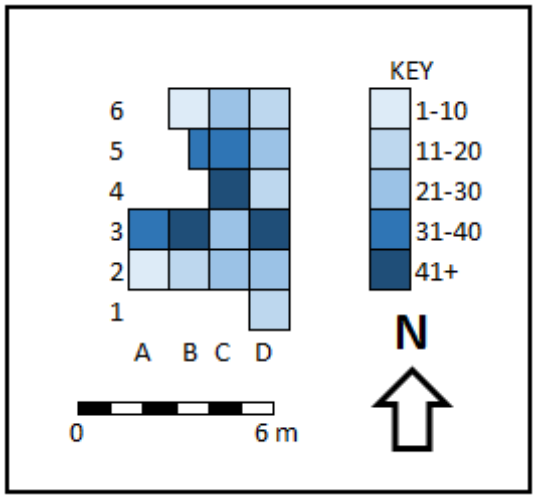


Figure 79: *Plan of HBK2014/034 showing the density of flaked stone artefacts across the site.*

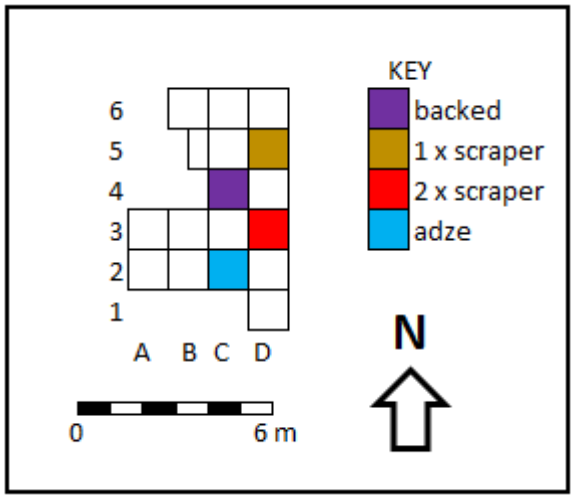


Figure 80: *Plan of HBK2014/034 showing the locations of retouched tools across the site.*

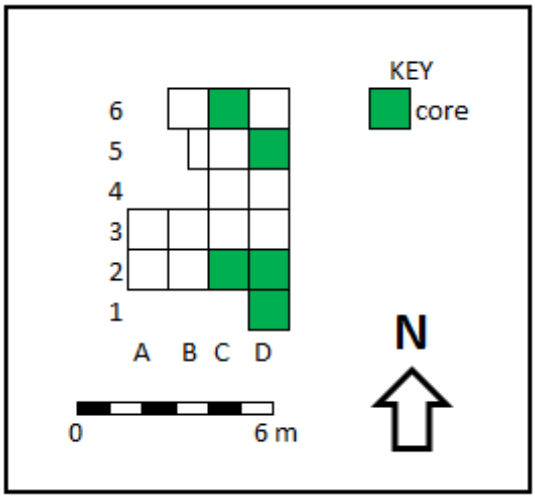


Figure 81: *Plan of HBK2014/034 showing the locations of cores across the site.*

6.7.3. Marine shell

A reasonable scatter of marine shell was present, although prior to the weathering and consequent degradation of the shell material there may have been a small, low density midden here. The total weight of shell collected was 401.3 g. The scatter seemed to be composed of just two species: *Cymbula granatina* and *Scutellastra granularis* (Table 18). It is interesting to note that the spatial distribution of marine shell is very similar to that of the flaked stone artefacts suggesting that the midden was located in the centre of the excavated area, possibly extending under the bushes towards the west (Figure 82).

Table 18: *Marine shell from HBK2014/022.*

Species	**n**	**%**
Cymbula granatina	94	43.7
Scutellastra granularis	111	51.6
Unidentifiable limpets	10	4.7

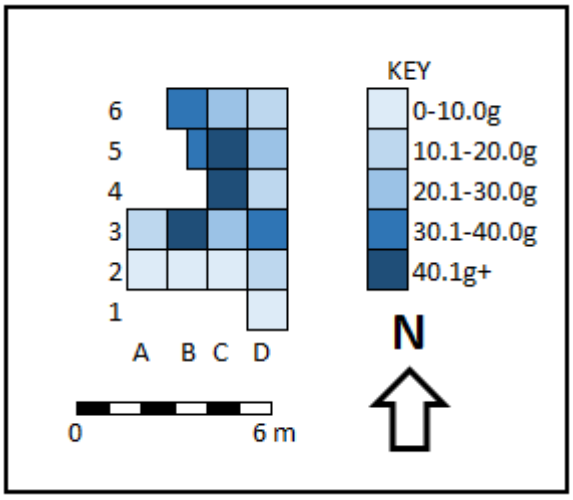


Figure 82: *Plan of HBK2014/034 showing the density of marine shell by weight (g/m²) across the site.*

6.7.4. Snail shell

A few fragments of snail shell were present but their patterning is not informative (Figure 83). They most likely relate to natural mortality. They were not retained in the collection.

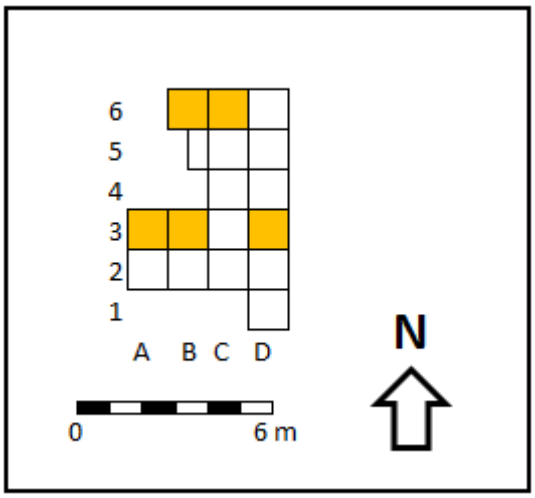


Figure 83: *Plan of HBK2014/014 showing the presence of snail fragments across the site.*

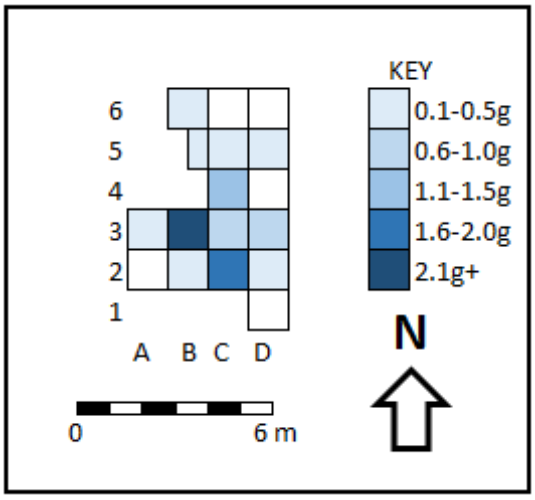


Figure 84: *Plan of HBK2014/034 showing the density of charcoal by weight (g/m²) across the site.*

6.7.5. Charcoal

Small charcoal fragments were commonly encountered across the site but with a concentration in the southern part (Figure 84). Although there was no sign of a hearth, this may point to a fire having been made on the southern side of the midden. Note that because of the fragility of charcoal, only the larger fragments were collected from the sieve. The total weight of the collected fragments was 8.6 g. A small test excavation was carried out off the site, a few meters

towards the west, in order to determine whether the charcoal might be naturally occurring, perhaps from a wild fire, but none was found there.

6.7.6. Age of site

From the stone artefacts, this site is likely to date between about 3000 and 2000 years ago. Being a shell scatter, it has plenty of good material for radiocarbon dating and an export permit has been applied for from SAHRA to date a single 2.7 g fragment of *Cymbula granatina* shell from square C4. Although charcoal is also considered a good material, there is the chance that wood which dies many years previously was collected from the landscape for making a camp fire. Should this have been the case then the date would be anomalously old. The marine shell at least would have died at the time of harvesting and consumption, and a date on this material would definitely date the deposition of the shell.

6.8. RFE2014/002

6.8.1. Excavation details

This deflation hollow was excavated on 29th April 2015. A total area of 37 m^2 was excavated in 1 m^2 units (Figure 85) using a 1.5 mm sieve throughout. The site was found to have a far lower artefact density than was anticipated because there was virtually nothing below the surface. The majority of the site was deflated to within about 1 cm of a compact soil and almost everything was in fact visible on the surface. As such, we elected to excavate small clusters of squares in various places in order to try to capture the denser patches of artefacts. The site did not produce much of interest and excavation was halted in favour of proceeding to other sites. The deflation hollow itself appeared to be quite poorly defined with a number of plants growing in the hollow which have attracted sand accumulation. There is no obvious lip to the deflation hollow (Figure 86). Because of the bushes and accumulations of sand it was difficult to know how much archaeology was likely to have been present. However, although we excavated a relatively small proportion of the entire hollow, it is likely that we collected perhaps one third of all the artefacts.

6.8.2. Stone artefacts

The excavation produced just 271 artefacts (Table 19), but many more were still present scattered very lightly across the site after the excavation was abandoned. The vast majority of the artefacts were made from quartz (Table 20). However, of the four other materials present, two (CCS and silcrete) were represented by single artefacts only. A peculiarity of the assemblage was that a number of non-quartz materials seemed to be represented by cores but flakes in the same materials were absent. An excellent example of this was a very large quartzite single platform core that had been made on a shallow grooved grindstone (Figure 87). This artefact was found in square E50 but excavation of four squares in that area yielded no flakes in the same material. A silcrete single platform core from square T74 and another on a cobble of unidentified igneous rock from square T56 were also the only artefacts recovered in those materials. CCS was represented only by a single bladelet. The artefact density was generally quite low, but little more can be said of the distribution (Figure 88).

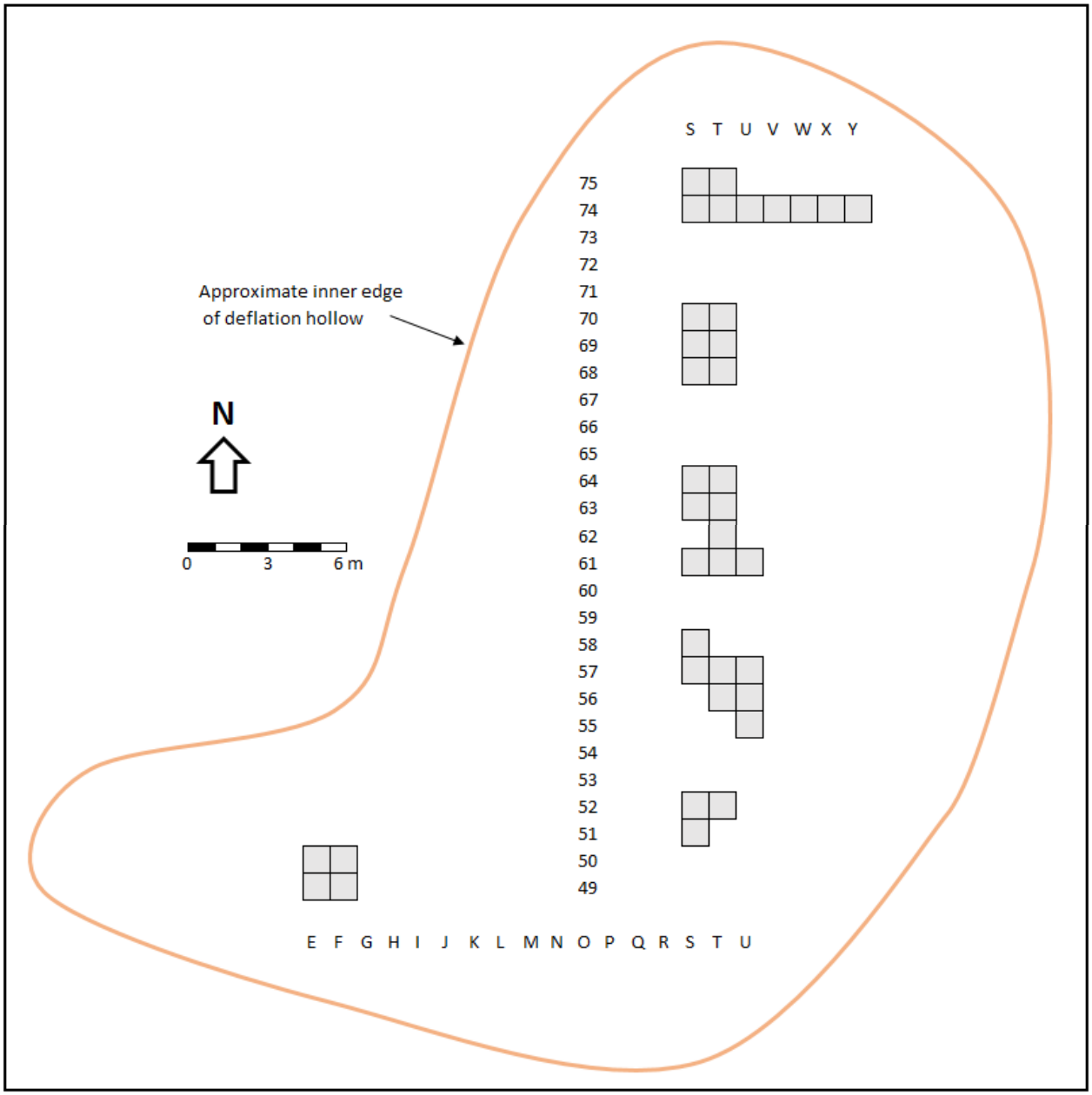


Figure 85: *Plan of site RFE2014/002 showing the location of the excavation within the deflation hollow.*

Table 19: *Stone artefacts from HBK2014/030 (excavated sample only).*

Artefact type	Quartz	CCS	Silcrete	Quartzite	Other
Scraper fragment	1				
Bipolar	1				
Single platform core	1		1	3	1
Irregular core	3			1	
Edge-damaged flake					
Blade					
Bladelet	8	1		2	
Flake	81			16	
Chunk	36			2	
Chip	109			2	
Hammer stone				2	

Figure 86: *View towards the southwest across the RFE2014/002 deflation showing its relatively poorly defined nature.*

Table 20: *Flaked stone materials from HBK2014/014 (excavated sample only).*

Material	%
Quartz	88.6
CCS	0.4
Silcrete	0.4
Quartzite	9.3
Other	0.4

Figure 87: *Quartzite single platform core made on a lower grindstone. The upper surface (the platform) of the core is the old grinding surface. The scale is in 1 cm intervals with the length of the grinding surface being 17 cm.*

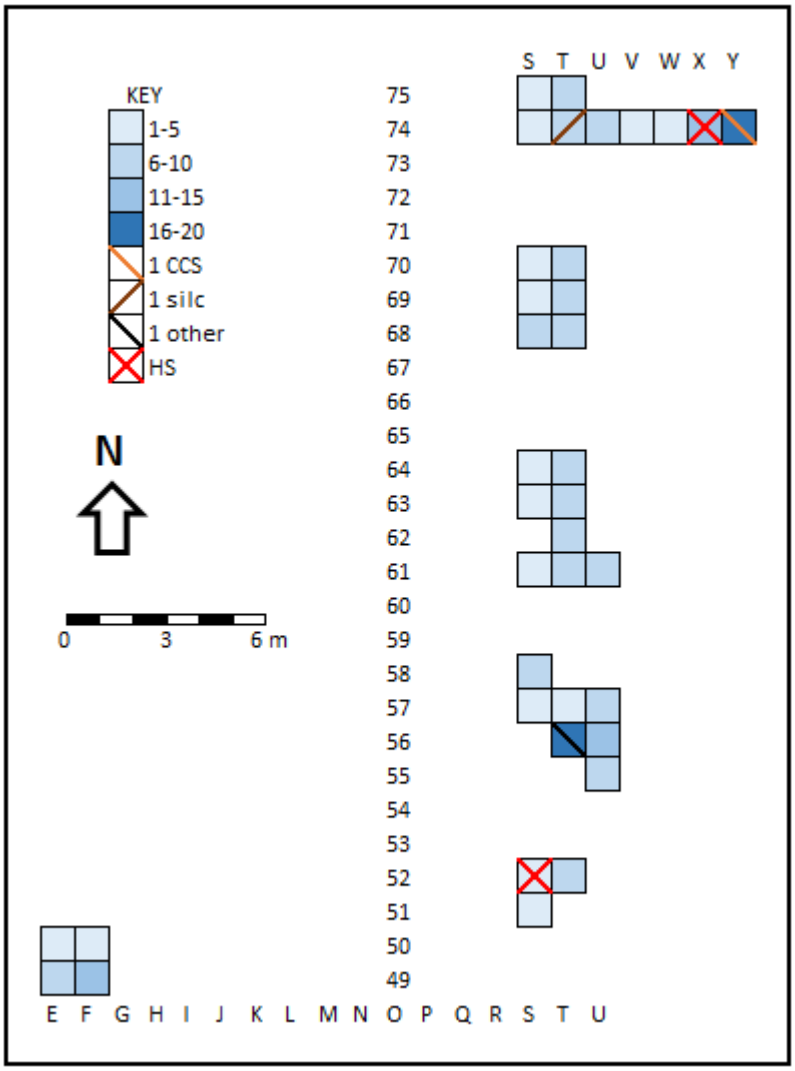


Figure 88: *Plan of RFE2014/002 showing the density of flaked stone artefacts across the site as well as the positions of individual items in CCS, silcrete and other and the two hammer stones.*

6.8.3. Ostrich eggshell

A single fragment of ostrich eggshell weighing 0.5 g was recovered from square T63.

6.8.4. Snail shell

A few snail shell fragments were noted in places across the site but these are almost certain to relate to natural die off. None were collected.

6.8.5. Age of the site

There is a high likelihood that artefacts of different ages are present on the site. There was evidence of variable patination and it is possible that a few of the quartzite artefacts in particular are MSA. Because of the variety in the degree of patination it was not possible to be sure of which artefacts were definitely LSA and which not, although the majority is certainly LSA. Only one organic item, a small ostrich eggshell fragment, was found. However, because of the potentially mixed assemblage, the site does not merit dating.

7. DISCUSSION

The mitigation described here (and summarised in Table 20) has recorded a number of deflation hollow occupations from southern Namaqualand, an area that has not been well researched in the past. A key observation of the project is that the artefacts assemblages were found to be consistent with the Namaqualand sequence as recorded along the coastline further north (Orton 2012) but not with those from sites further south, for example at Elands Bay which has been very well studied (Orton 2006). The Namaqualand sequence is, in general, better defined, but this may well be a product of the nature of archaeological sites in the region: they are almost exclusively open, single occupation sites, whereas further south occupation is often focused around rocky headlands and overprinting, which blurs the artefact sequence, is common.

Table 20: *Summary table of the excavations reported above.*

Site	Area excavated	Contents	Age	C14 samples
HBK2014/ 004	34 m^2	Flaked stone artefacts only. Quartz backed tools, no scrapers.	Likely <2.1k BP	0 (no organics)
HBK2014/ 014	137 m^2	Large stone artefact assemblage. Variety of backed tools and scrapers. Spatial patterning present suggesting different ages for different parts of the scatter. Rare ostrich eggshell fragments but association in doubt.	Part likely 6-4k BP Part likely 4-2k BP	0 (not likely to be informative)
HBK2014/ 015	164 m^2	Very large stone artefact assemblage. Large variety of backed tools dominated by segments but scrapers rare. Rare marine shell and ostrich eggshell fragments.	Likely 6-4k BP	1 (marine shell fragment (possibly *C. granatina*) of 2.0 g, square T24) 1 (ostrich eggshell (*S. camelis*) fragment of 0.6 g, square K17)
HBK2014/ 022	55 m^2	Flaked stone artefacts (retouch dominated by backed tools), a probable stone feature, one ostrich eggshell fragment and a small collection of marine shell.	Possibly 6-4k BP	1 (marine shell (*C. granatina*) fragment of 4.4 g, square L63)
HBK2014/ 030	59 m^2	Flaked stone artefacts, marine shell and bone (latter of variable age).	Likely <2.1k BP	0 (not likely to be informative)
HBK2014/ 031	28 m^2	Flaked stone artefacts and a single small fragment of marine shell.	Likely <2.1k BP	0 (not likely to be informative)
HBK2014/ 034	16.5 m^2	Flaked stone artefacts (retouch includes only scrapers and an adze), marine shell and charcoal.	Likely 3-2k BP	1 (marine shell (*C. granatina*) fragment of 2.7 g, square C4)
RFE2014/ 002	37 m^2	Flaked stone artefacts, possibly of mixed age (only retouch is a single scraper fragment), and a single ostrich eggshell fragment.	Likely mixed age	0 (not likely to be informative)

Because of the time required to obtain an export permit, the results and implications of the radiocarbon dating will be communicated in a follow-up letter. Table 20 lists the samples planned for dating.

HBK2014/015 is a highly significant site and likely to be the oldest site of the series, dating to between about 6000 and 4000 years ago. Open sites of this age are rare along the west coast of South Africa with Jakkalsberg N in the Richtersveld (Orton & Halkett 2010), KN6-3C near Koingnaas and MB2005/005B at the Spoeg River Mouth (Dewar 2008; Orton 2012) being the only studied examples. Although the former is a palimpsest, it is dominated by backed artefacts. The other two also have many scrapers, but backed tools dominate in each case. HBK2014/015 is unique with its extreme dominance of backed tools. The site contains an extremely rich stone artefact assemblage that is helpful in understanding LSA artefact typology because of the presence of some rare forms, particularly those with diagonal backing: the trapezium, triangles and truncated artefacts.

HBK2014/014 is also an important site for similar reasons, but its assemblage is far smaller. The presence of spatial patterning on the site, however, hints at either different activities across the site or alternatively it tells us that different parts of the deflation hollow were occupied at different times. Sadly, because of the dearth of dateable organic material, this is a question we may never be able to answer.

Both these two sites contain segments, HBK2014/015 far more so than HBK2014/014. This artefact type is a very strongly patterned type, although there is some range in their length and breadth. Segments were in fact once considered the hallmark of the Holocene industry known as 'Wilton'. Deacon's (1972:38) definition of Wilton assemblages suggested they should have 'varying proportions of small scrapers and microlithic backed tools, essentially including segments', although this definition is clearly problematic (Orton 2014b). Figure 89 plots these dimensions for the 46 complete segments recovered. Their average length : breadth ratio is 2.22, while the range extends from 1.56 to 3.12. The graph makes it clear that their form remains relatively similar from artefact to artefact, although there are occasions when outliers are found.

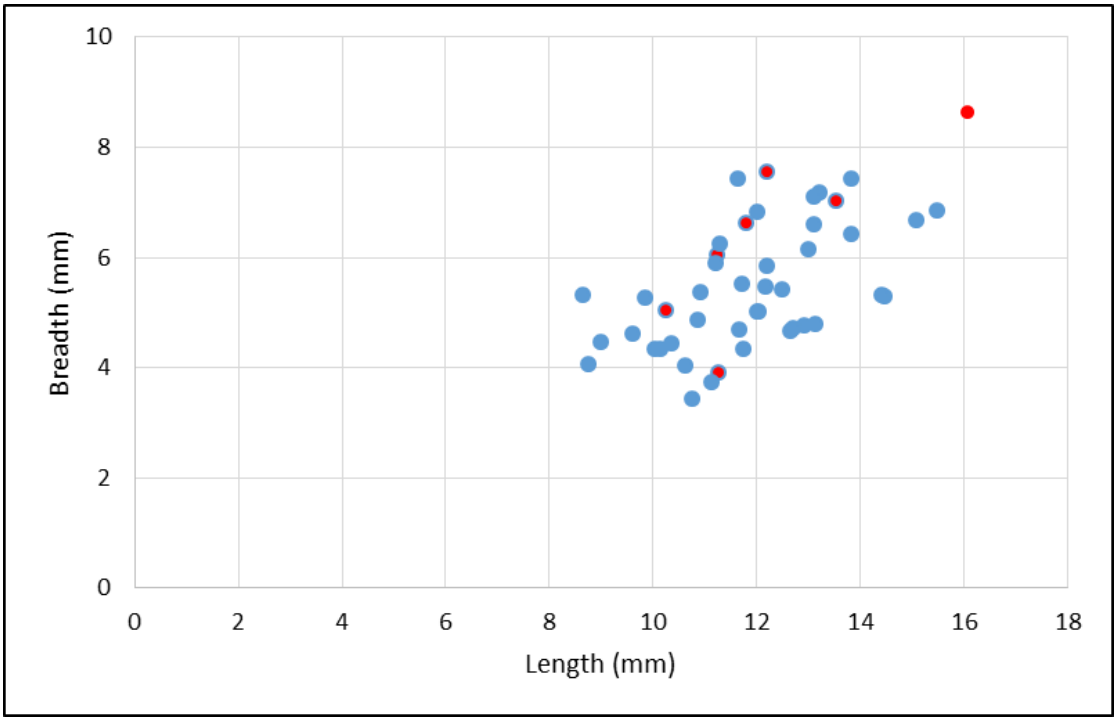


Figure 89: *Scatter plot of the length and breadth of segments from HBK2014/014 (red dots) and HBK2014/015 (blue dots), the only sites to contain more than one segment.*

The other excavated sites contribute in various ways to the overall understanding of the Namaqualand archaeological sequence. Much more work is required across the region to fully understand the sequence. Orton's (2012) examination of sites further north revealed three different types of stone artefact industries. Relating these to the Bushmen and Khoekhoen is tricky because one of these groups must have produced two types. The slightly different stone material available in the northern and southern parts of Namaqualand will also have had an effect on assemblage composition. It is noticeable that the frequencies of quartzite tend to be higher in the present sample than in those from further north. It seems that all three types are present here but they do not manifest in exactly the same ways as they do to the north. An interesting continuity, however, is the general reluctance to use silcrete in both areas. Although it is present slightly more frequently in the sites reported here than in sites to the north, it is clear that it is not the desirable material that it is further south, for example around the Elands Bay area (Jerardino & Yates 1997; Orton 2006) or on the Vredenburg Peninsula (Orton 2009; Sadr & Gribble 2010; Smith 2006). Although sources for CCS are generally not known in Namaqualand, this material was clearly available and deemed to be of better quality than the silcrete which is relatively easy to find and collect. The presence of coarse-grained cortex on some pieces does suggest that they may have formed as chemical precipitates within calcrete and the nodules were then collected from areas where the calcrete had weathered away.

It is clear that despite the work that has already been done in Namaqualand there is a long way to go in terms of fully understanding the archaeological sequence there. In particular, the region is very important in understanding the introduction of pastoralism and the Khoekhoen people to the southernmost parts of the subcontinent. Namaqualand has already yielded the earliest direct date for cattle in South Africa (Orton *et al.* 2013), but yet we still do not know fully how to identify the Khoekhoen from their archaeological signature. One of the Soutpan 1 sites that will be further excavated and described in a subsequent report promises to help answer this question.

8. CONCLUSIONS

It is considered that the mitigation project has been successful in the two mining areas under consideration in this report. One particularly important site (HBK2014/015) was revealed and, because of the very wide variety of artefact types present on it, it adds significantly to our understanding of artefact typology during the mid-Holocene period on the west coast. There are very few sites of this age known in Namaqualand. Most of the other excavated sites add to the general understanding of the Holocene archaeological sequence in the area, although RFE2014/002 appears not to have been useful in this regard. Mitigation work is to continue in the Soutpan 1 mining area and a second report will be produced describing its findings.

9. RECOMMENDATIONS

Although there are no areas that require *in situ* conservation, the chance always exists that buried archaeological remains or human burials might be encountered during the course of topsoil clearing. It is nevertheless recommended that mining be allowed to proceed as follows:

- Mining of all mining blocks within the Langlaagte 3 mining area should be allowed to proceed subject to the continued protection of HBK2014/018, HBK2014/020 and HBK2014/021 all located to the south of the main access road;
- Mining of all mining blocks within the Soutpan 2 mining area should be allowed to proceed;
- Mining of all mining blocks within the Joetsie mining area should be allowed to proceed subject to the continued protection of GR2014/001;
- If any archaeological material or human burials are uncovered during the course of mining then work in the immediate area should be halted. The find would need to be reported to Heritage Western Cape 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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