ARCHAEOLOGICAL MITIGATION OF LATER STONE AGE SITES ON THE REMAINDER OF PORTION 4 OF KLIPGATS PAN 117, PRIESKA MAGISTERIAL DISTRICT, NORTHERN CAPE

SAHRA Case ID: 315

Report for:

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EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Mulilo Prieska PV (Pty) Ltd to undertake mitigation of seven Later Stone Age sites occurring within the footprint of a proposed photo-voltaic facility on Portion 4 of the remainder of Farm 117 Klipgats Pan, near Copperton in the Northern Cape.

The sites all lay within close proximity of an ephemeral and now non-functional (due to construction of the R357 road) water course traversing the property. They were generally located in sandier patches, sometimes completely surrounded by gravel. The general landscape is coated in gravel and it is clear that sandy areas were targeted for occupation.

One site consisted only of an *ex situ* pottery scatter which was collected for analysis; it is likely that a spouted pot is represented and the two refitting rim sherds indicate a vertically oriented simple round rim. The other six sites contained assemblages with variable quantities of stone artefacts, plain and engraved ostrich eggshell, tiny fragments of animal bones and occasional undecorated pot sherds. Stone materials included quartz, quartzite, cryptocrystalline silica, hornfels and other igneous rock types that could not be further identified. Many retouched tools were included in the samples. There were also hammer stones, grindstones and anvils, with many artefacts having been used for more than one purpose. Reuse of older artefacts collected from the surrounding landscape was also noted at times, particularly in KGP2014/008. Other materials were probably mostly sourced from the immediate environment with very little evidence of long distance transport of stone being present. The engraved patterns on the ostrich eggshell consisted of parallel lines, often turned into 'ladders' through the application of further lines in between, either at 90° or at an angle. Such patterns are common throughout western South Africa.

This suite of sites has provided a valuable sample of late Holocene archaeological material from northern Bushmanland. Further research into these and other sites from the region will certainly contribute to a better understanding of the region's archaeological heritage and may even help to answer questions relating to the advent of herding during the last 2000 years in South Africa. A clearer understanding of the artefact manufacturing industries known as 'Springbokoog', 'Swartkop' and 'Doornfontein' is certainly needed and it is anticipated that these sites will make a valuable contribution in this regard, thus underlining the value of the mitigation project.

It is recommended that SAHRA accept this report as the final heritage requirement prior to construction of the proposed Mulilo Prieska PV facility on the remainder of Portion 4 of Klipgats Pan 117. It should be noted, however, that if any further *in situ* archaeological material (including human burials) is 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 material is the property of the state and may require excavation and curation in an approved institution.

Glossary

Backed bladelet/point: Long, thin artefact with a sharp edge opposing an edge that has been deliberately blunted by retouch. They are sometimes pointed.

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

Boss: Lump of clay added to the outside of a pot to create a bump that facilitates holding.

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

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

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

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

Lug: Lump of clay added to the outside of a pot and then pierced in order to create a small handle (likely used primarily for threading a thong).

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

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

Scraper: Artefact with an edge deliberately retouched so as to have an edge-angle typically in the range of 20°-70°.

Segment: A backed tool with the backed margin curved and the opposing margin straight such that the margins meet in points.

Abbreviations

ASAPA: Association of Southern African Professional Archaeologists

CCS: Cryptocrystalline silica

CRM: Cultural Resources Management

EIA: Environmental Impact Assessment

ESA: Early Stone Age

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

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

SAHRA: South African Heritage Resources Agency.

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Mulilo Prieska PV (Pty) Ltd to undertake mitigation of Later Stone Age (LSA) sites occurring within the footprint of a proposed photo-voltaic facility on the remainder of Portion 4 of Farm 117 Klipgats Pan, near Copperton in the Northern Cape (Figure 1). The sites were found during the final walk-through survey (Orton 2014) that was required before construction. All were located close to an ephemeral and now non-functional water course running from north to south then southwest across the western part of the development site (Figures 2 & 3).

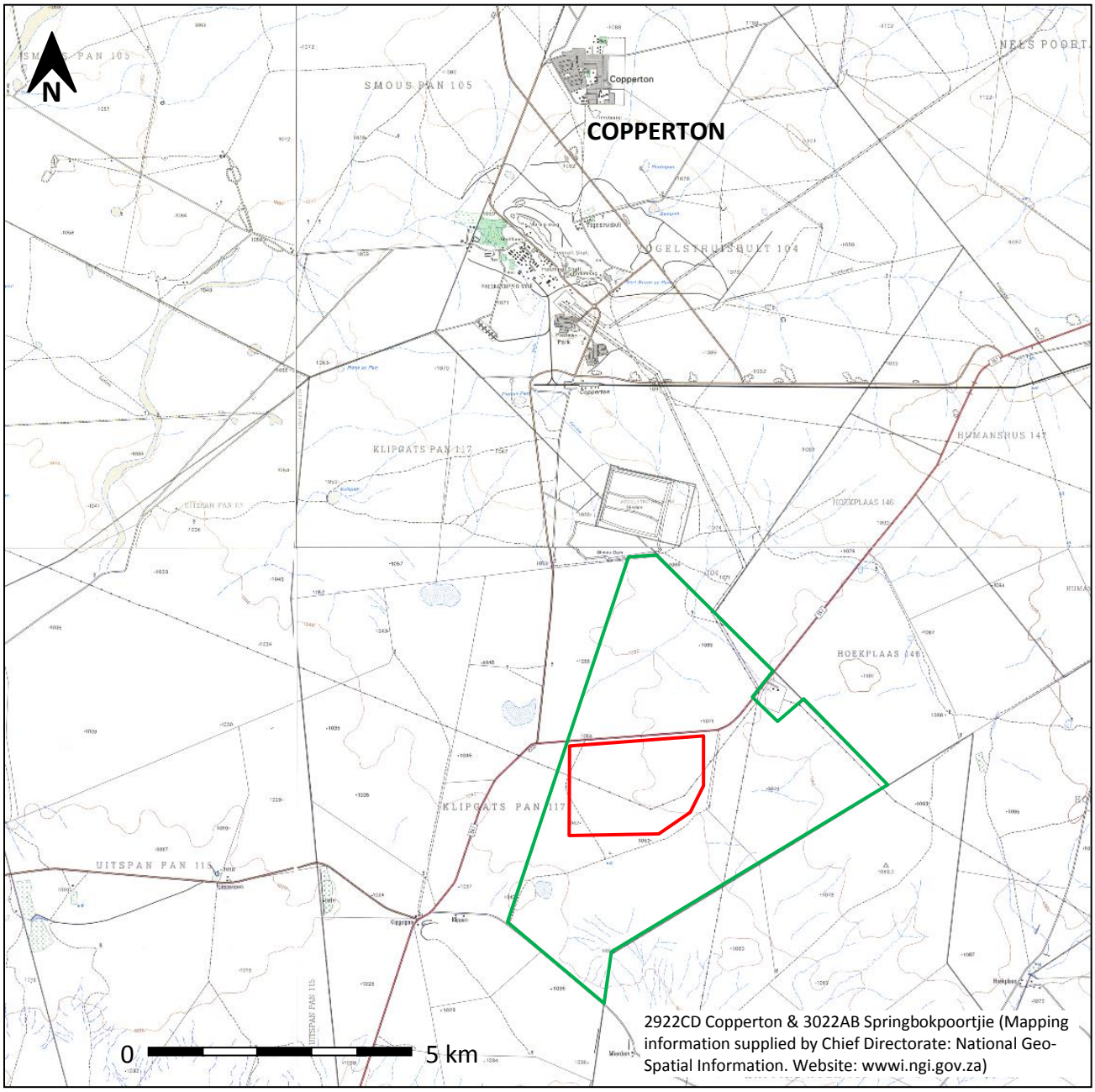


Figure 1: *Map showing the location of the site. The town of Copperton lies to the north. The green polygon indicates the farm, while the red polygon indicates the proposed layout of the facility. Development will only occur north of the power lines traversing the site.*

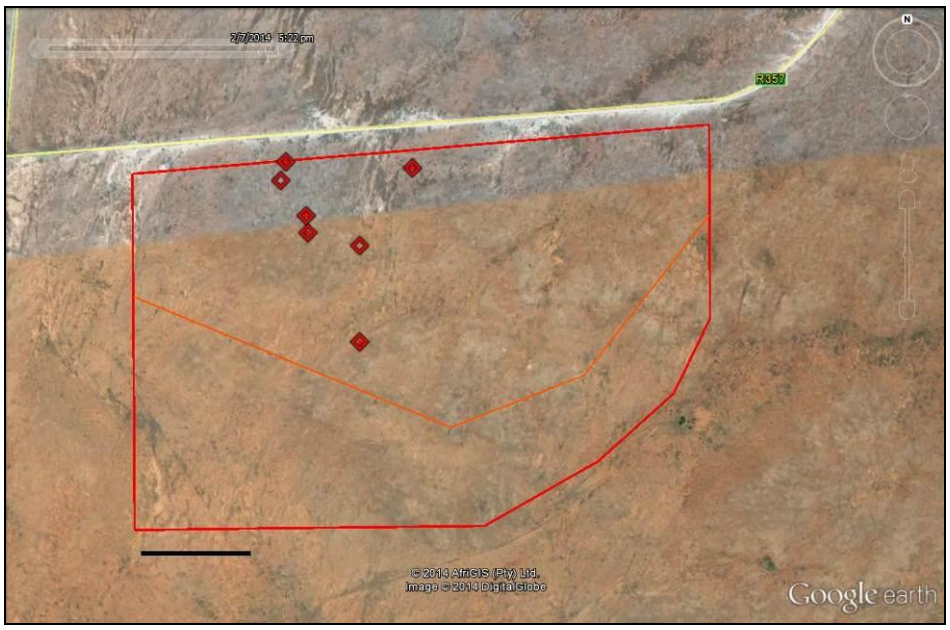


Figure 2: *Aerial view of the final development footprint (red polygon) showing the locations of the mitigated sites. The black scale bar is 500 m long. The development will be constrained to the area above the orange line which marks the existing power lines.*

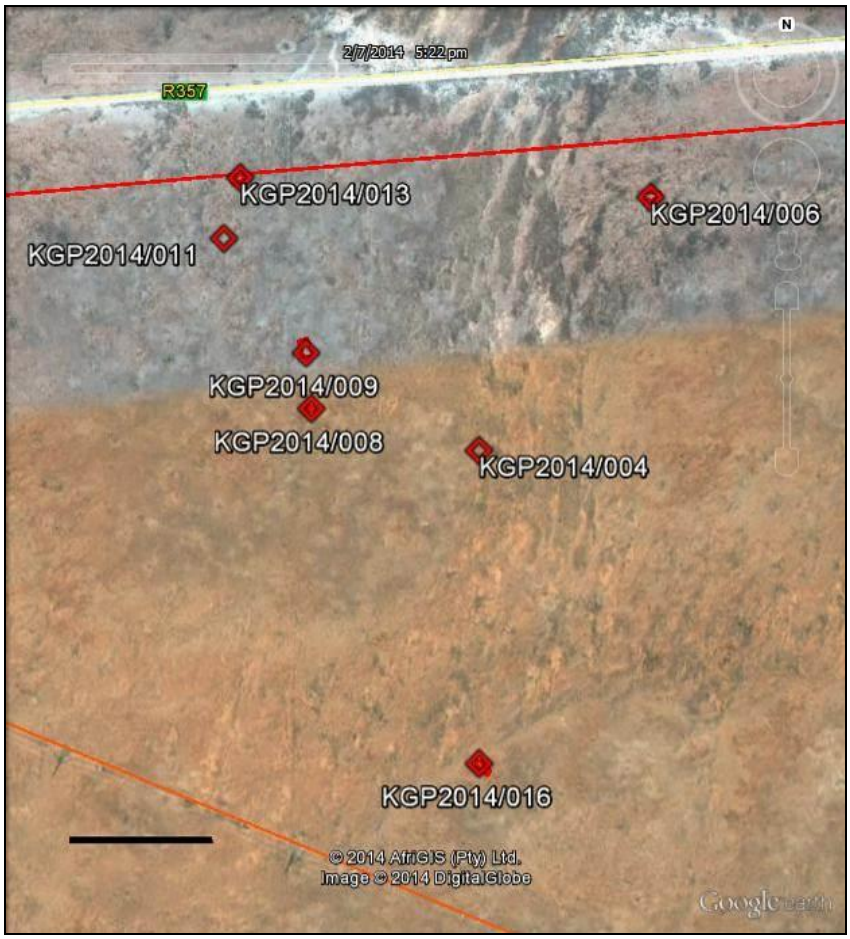


Figure 3: *Aerial view of the central part of the proposed development area showing the names of the excavated archaeological sites. The ephemeral drainage line can be seen running from north to south then turning towards the southwest. The black scale bar is 200 m long.*

1.1. Terms of reference

ASHA Consulting was asked to conduct the required mitigation in order to ensure compliance with the National Heritage Resources Act (NHRA).

1.2. Scope and purpose of the report

This report describes the archaeological excavations conducted as well as the results of the analyses of the excavated material. It essentially rescues data that would otherwise have been destroyed through development of the site and preserves it for future researchers. The excavations will have significantly reduced the chances of any significant archaeological material being located during construction.

The report will be reviewed by the South African Heritage Resources Agency (SAHRA) who will be able to issue a final comment indicating compliance with all requirements in terms of the NHRA.

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 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).

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 National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

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

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

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;

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

The material remains excavated during this project fall under the protection of Section 35 of the NHRA as described above.

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context of the excavated sites. This literature included published material, academic theses and unpublished commercial reports.

3.2. Excavations and analysis

Excavations were carried out from 31st March to 2nd April 2014. At all sites except KGP2014/004 an excavation grid of 1 m by 1 m squares was laid out over the artefact scatters using a long tape measure. Excavation was carried out in these 1 m^2 units. At four of the sites (KGP2014/008, 009, 011 & 013) a 3 mm sieve was used, while the deposit from the remaining two (KGP2014/006 & 016) were sieved through a 1.5 mm sieve. All material was sorted from the gravel on site and returned to Cape Town where analysis was undertaken.

The stone artefacts, which comprised the bulk of the samples, were analysed following the LSA lithic typology developed by Orton (2004, 2012). Ostrich eggshell fragments, which comprised much of the remaining finds, were counted and weighed and checked for any signs of modification. Pottery was counted and weighed, the thickness of each sherd was measured and, where possible, other characteristics were described following the typology established by Sadr

and Sampson (1999: fig. 3), Sampson and Sadr (1999: fig. 2 & fig. 3) and J. Rudner (1968: table 1 & fig. V).

3.3. Assumptions and limitations

During excavation the archaeological materials were found to overlie a layer of very hard silt. Testing the deposits below these silts in places revealed no more artefacts and it was thus assumed that this pattern would hold true throughout the excavated areas. Where the 3 mm sieve was used it was assumed that no significant finds would be lost. This is generally the case on almost all archaeological sites and the only losses likely in this case would have been occasional very small stone chips.

3.4. Project team members

Principal Investigator: Dr Jayson Orton
Field and laboratory assistant: Carol Orton

4. PHYSICAL ENVIRONMENTAL CONTEXT

The study area is generally very flat, although minor undulations do occur. The archaeological sites tended to be located in close proximity to an ephemeral drainage line that crosses the property. This drainage is now non-functional due to the construction of the R357 road across it. Within this area there are frequent patches of dried mud platelets indicating areas where standing water has accumulated during rain storms. Along the drainage the substrate is generally sandy with minimal gravel. Further away the substrate includes far more gravel. The archaeological sites described here were all found in sandier patches, sometimes completely surrounded by gravel. The vegetation is mostly approximately shin-high, although occasional taller bushes do occur, often along the drainage line around areas where standing water occasionally accumulates. Archaeological sites were sometimes located among clusters of these taller bushes (e.g. Figures 4 & 5).

Figure 4: *View towards the north across site KGP2014/004 which is located alongside the taller bushes in the middle ground.*

Figure 5: *View across site KGP2014/016 looking towards the northwest. The site is in the sandy area in the foreground among slightly taller bushes. The old drainage line lies in the middle ground.*

5. CULTURAL HERITAGE CONTEXT

This section of the report establishes what is already known about the archaeological heritage resources in the vicinity of the study area, but focusing on the LSA which is the subject of the excavations reported below. Through establishing this context the excavated sites can be built into the wider picture of LSA occupation of northern Bushmanland.

Bushmanland is well known for the background artefact scatter that occurs in so many areas. Beaumont *et al.* (1995: 240) wrote that "thousands of square kilometres of Bushmanland are covered by a low density lithic scatter". These artefacts are generally very well weathered and mostly pertain to the Early (ESA) and Middle Stone Age (MSA). They are considered to be background scatter because their distribution is conditioned more strongly by geological actions than human actions. Occasional Later Stone Age (LSA) artefacts are also present within this scatter and these were no doubt dropped there during recent millennia. These kinds of finds have been documented during previous surveys in the area, including surveys on Klipgats Pan (Kaplan 2010; Kaplan & Wiltshire 2011; Orton 2011; Orton & Webley 2013).

A significant aspect of the Northern Cape archaeological record is the presence of pans which frequently display associated archaeological material. The only detailed work in this regard is that of Kiberd (2001, 2005, 2006) who excavated Bundu Pan, some 25 to 30 km northwest of

Copperton. The site had initially been identified through excavations to obtain gravel for surfacing local roads with early observations noting MSA artefacts on quartzite eroding from the sections (Beaumont *et al.* 1995). The site was subsequently excavated between 1998 and 2003 and, importantly, found to actually contain stratified deposits ascribable to the ESA, MSA and LSA (Kiberd 2006). The only other site in the Northern Cape Province to contain all three Stone Ages is Wonderwerk Cave near Kuruman with its deep stratified deposits (Humphreys & Thackeray 1983). Such sites are generally rare in South Africa.

Several Later Stone Age sites in the Bushmanland area to the northwest, west and southwest of Copperton have been investigated by Beaumont and colleagues (1995), Smith (1995a) and Parsons (2003, 2004, 2006, 2007, 2008). Work on these sites led to a distinction between hunter-gatherer and herder sites, based on stone artefact assemblages (Beaumont *et al.* 1995; Beaumont & Vogel 1984, 1989; Parsons 2003), but this has recently been called into question (Parsons 2007). Briefly, within the last 2000 years the hunter-gatherer assemblages, termed 'Swartkop', were said to be dominated by hornfels, but with some quartz, and to have many blades; backed blades were a common retouched type (Morris 1990; Orton 2002/3). Earlier assemblages have proportionally more blades and fewer potsherds with later sites the reverse. Ceramics are usually grass-tempered (Beaumont & Vogel 1989). The herder sites, termed 'Doornfontein', were said to contain mostly irregular flakes usually made on quartz and to have many potsherds, including lugs and spouts, associated with them, but with lugs absent on sites older than about AD 700 (Beaumont *et al.* 1995). Smith (1995a) notes that Doornfontein sites tend to occur along the Orange River, while 'Swartkop' sites are usually found further from the river. Sites dating more than about 2000 years ago belong to a group that Beaumont *et al.* (1995) refer to as 'Springbokoog'. Such sites are probably the predecessors of the Swartkop sites and also have high frequencies of backed blades though to the east backed blades and scrapers may be more equal in proportion as shown by a sample from Prieska. All these Later Stone Age sites have very few, if any, organic items on them. The only organic find usually present is fragments of ostrich eggshell which originated either from eggs eaten or else whole shells used as flasks. Many such flasks have been found across the Northern Cape (Morris 1994; Morris & Von Bezing 1996), including close to Copperton (F. Ekkert, pers. comm. 2014).

Small, low circular structures constructed of rocks have also been recorded in the Northern Cape. Work further east along the Orange River (Sampson 1968), in the Seacow Valley in the eastern Karoo (Sampson 1986), and also at Bloubos northwest of Upington (Parsons 2004) suggests they may well have been the bases in/on which huts or windbreaks were constructed. A local farmer, Frans Ekkert (pers. comm. 2014), reports that a few such structures were located to the south of Klipgats Pan but have since been destroyed by power line development. He described each as having an opening that faced towards the east.

Indigenous people were present in this area until quite recently with Mr Ekkert, informing us that when his grandfather began farming in the area in 1864 there were still many Bushman living there. Smith (1995b) notes that around that time white farmers were making extensive use of Bushmanland for summer grazing and that this led to the extermination of the massive springbok herds on which the indigenous population subsisted. This in turn led to the descendants of indigenous groups turning to the farmers for food (and employment), effectively ending the span of prehistory in the region.

6. FINDINGS OF THE EXCAVATIONS

This section presents the analyses of all the excavated materials. It should be noted that identification of stone materials was at times difficult and it is quite likely that some of what has been identified as 'quartzite' is, in fact, a type of igneous rock. The material 'other' is generally used for igneous rocks where these are obvious. Other unidentifiable stone materials are also placed within 'other'.

6.1. KGP2014/004

This site was comprised merely of a scatter of sixteen potsherds alongside an open area in the abovementioned drainage line. Figure 4 shows the local context of the site and Figure 6 the context of the pottery scatter. No formal excavations were carried out since there was nothing in good context but sand from the surface was scraped up and sieved to recover any further unseen sherds. The value of the site lay purely in that potsherds appeared to be rare in the Copperton area and that the sherds from this collection might be refitted to provide details on the type of pottery present in the area.

Figure 6: *KGP2014/004 with the location of the collected pot sherds in the foreground alongside the small animal excavation.*

All plain body sherds (12) were measured for thickness. Minimum and maximum values on each sherd were averaged in order to arrive at a thickness for the sherd. In this way minimum and maximum mean thicknesses of 5.90 mm and 8.27 mm were obtained. Although encompassing quite a broad range, these values are fairly standard for LSA pottery which is usually in the 6 mm to 7 mm range. The sherds were found to contain a mixture of mineral and fibre temper (Figure 7). Fibre temper is said to have been used by the Bushmen in central South Africa in pots made by them (Bollong *et al.* 1993, 1997). Two sherds show evidence of an externally applied feature. One of these preserves part of a hole that may have been made before application of a spout to the outside of the pot (Figure 8). The area from which the spout has broken away is visible. The second sherd could relate to a spout, a boss or a lug – the two do not refit. The final aspect of the pottery collection of interest is the two rim sherds which refit to one another (Figure 9). Although one shows signs of having a half round rim, it is perhaps best to describe them as simple round. Their orientation appears to be vertical. Although three body sherds could be refitted to each

other, there is unfortunately not enough detail to reconstruct the entire shape of the pot. It does seem very likely, given the context of the scatter and their cumulative appearance, that the sherds all relate to a single pot. The total weight of the sherds is 78.7 g.

Other items collected during the sieving include a single very small ostrich eggshell fragment, six quartzite flakes, one cryptocrystalline silica (CCS) flake, and one CCS retouched and somewhat weathered artefact, likely a miscellaneous retouched piece (MRP). The six quartzite flakes are unweathered and most likely to relate to the pot sherds. Pottery is known to only occur in South Africa within the last 2000 years and the stone artefacts do not help constrain the age of the scatter.

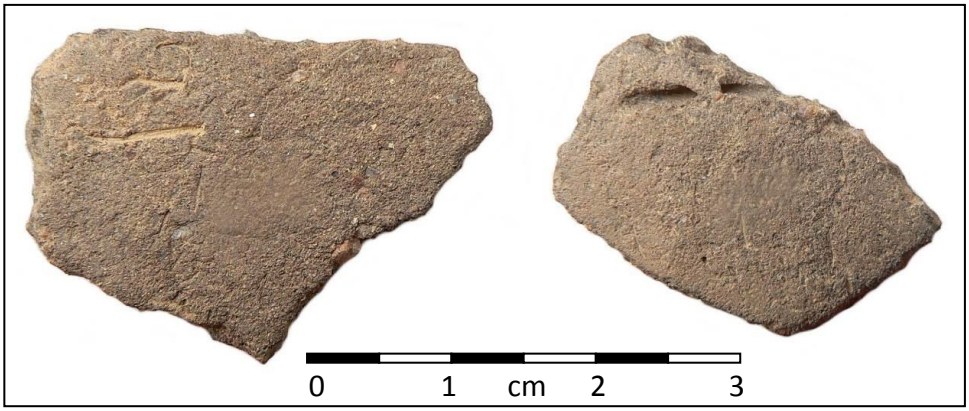


Figure 7: *Two pot sherds from KGP2014/004 showing the thin grooves and tunnels that result from the use of fibre temper. The fibre burns during the firing process leaving the cavities.*

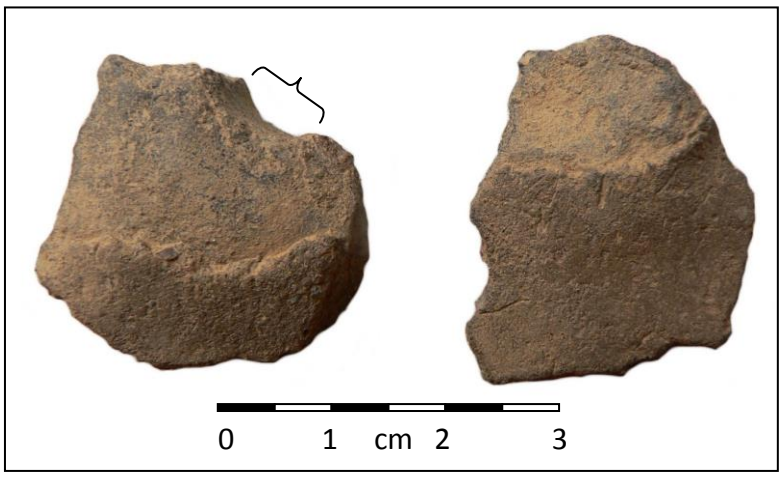


Figure 8: *Two pot sherds from KGP2014/004 showing evidence of having had a spout attached to them, on the upper half in each case. That on the left has part of a hole evident in the upper right hand corner (bracketed).*

Figure 9: *The outside surface of the two refitting rim sherds from KGP2014/004.*

6.2. KGP2014/006

This is the largest and perhaps the most significant site excavated during the project. The site manifested as a fairly dense scatter of stone artefacts and ostrich eggshell fragments in the main area (the vicinity of square V22) with lighter density scatter around the periphery and also on a

second associated scatter lying to the west. In total, an area of 103 m^2 was excavated as shown in the site plan in Figure 10. The vicinity of the site displayed a lower density of vegetation (Figure 11), although not all of this relatively clear area contained archaeological material. The area between the two excavations and extending towards the north contained many small mud platelets indicating that, at least today, standing water accumulates there after rain showers. This area had very few, if any, artefacts in it.

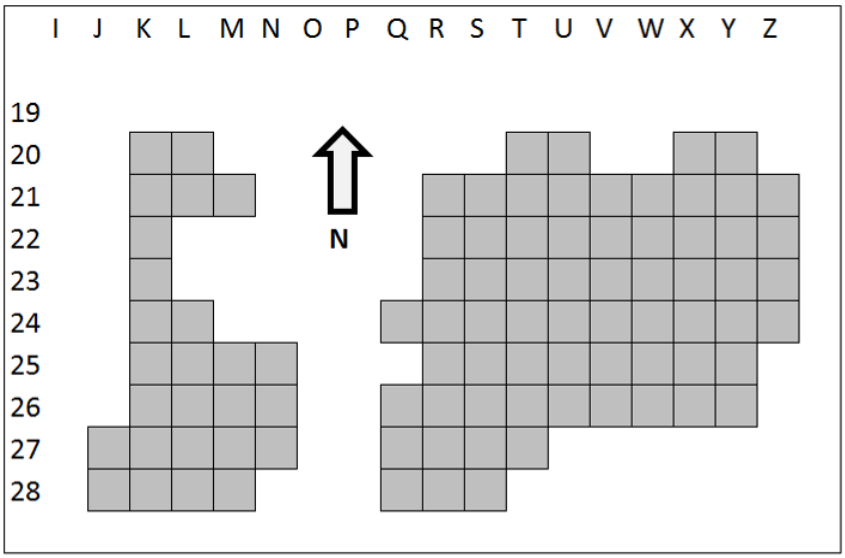


Figure 10: *Map of the excavated area at KGP2014/006. All squares are 1 m^2.*

Figure 11: *View towards the west over the main excavation area at KGP2014/006.*

6.2.1. Stone artefacts

Table 1 presents the typological analysis of the 893 flaked stone artefacts recovered. It can be seen that the assemblage is strongly dominated by quartz and that the retouched types are almost all backed bladelets, the only exception being an adze. In the south-western parts of South Africa it is common to find adzes made on old MSA flakes and blades. In this instance an already

retouched artefact was collected and flaked further to produce the adze (Figure 12). Although not quantified, it is notable that the quartzite flakes are generally far larger than those made from quartz. In addition to the flaked artefacts there are also two stones used as both a hammer stone and an upper grindstone; both are in quartzite. No lower grindstones were found.

***Table 1**: Typological analysis of flaked stone artefacts from KGP2014/006.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Bipolar core	3							
Single platform core	9	2	1			1		
Single platform bladelet core	2							
Irregular core	6	5	2			1		
Miscellaneous backed scraper							1	
Backed bladelet	11							
Backed point	1							
Backed bladelet fragment	2							
Backed piece fragment	2							
Adze			1					
Notched flake						1	1	
Miscellaneous retouched piece							1	
Edge-damage blade	1							
Edge-damage flake	3	1	2			3	1	
Edge-damage chip							1	
Blade	16	1						
Bladelet	35	1						
Flake	432	47	9	1		16	2	
Chunk	91	1	4		2	2	1	
Chip	198	2	1		1			
Total per stone material	**812**	**60**	**20**	**1**	**3**	**24**	**8**	**0**
% of stone material	**90.9**	**6.7**	**2.2**	**0.1**	**8.6**	**68.6**	**22.9**	**0**

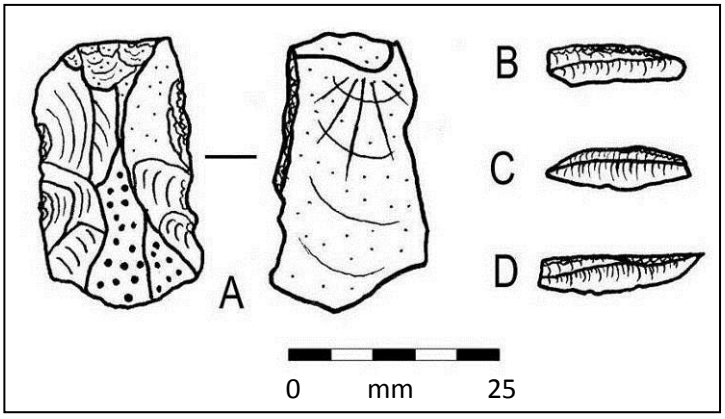


***Figure 12**: Selection of retouched artefacts from KGP2014/006. A: Adze (CCS) with original cortex denoted by heavy stippling and older flaked surfaces by light stippling; B & C: backed bladelets (quartz); D: backed point (quartz).*

Figure 13 shows the density distribution of LSA flaked artefacts across the site. The primary area of concentration was in the east, but activities involving backed bladelets were carried out in both patches of the site. Artefacts belonging to the background scatter follow a broadly similar distribution (Figure 14) and it is likely that many of them were collected by the LSA people and incorporated within their assemblage. This is evidenced by the collection and reuse of some artefacts, like the large flake reused as a core shown in Figure 15. In the photograph the scars along the upper left hand side are fresh, while the older dorsal scars of the original flake are patinated red. The choice to reuse stone is a logical one, since the stone material has already shown itself to be good during the earlier flaking episode. Older artefacts reused during the LSA are included in Table 1 as part of the LSA occupation.

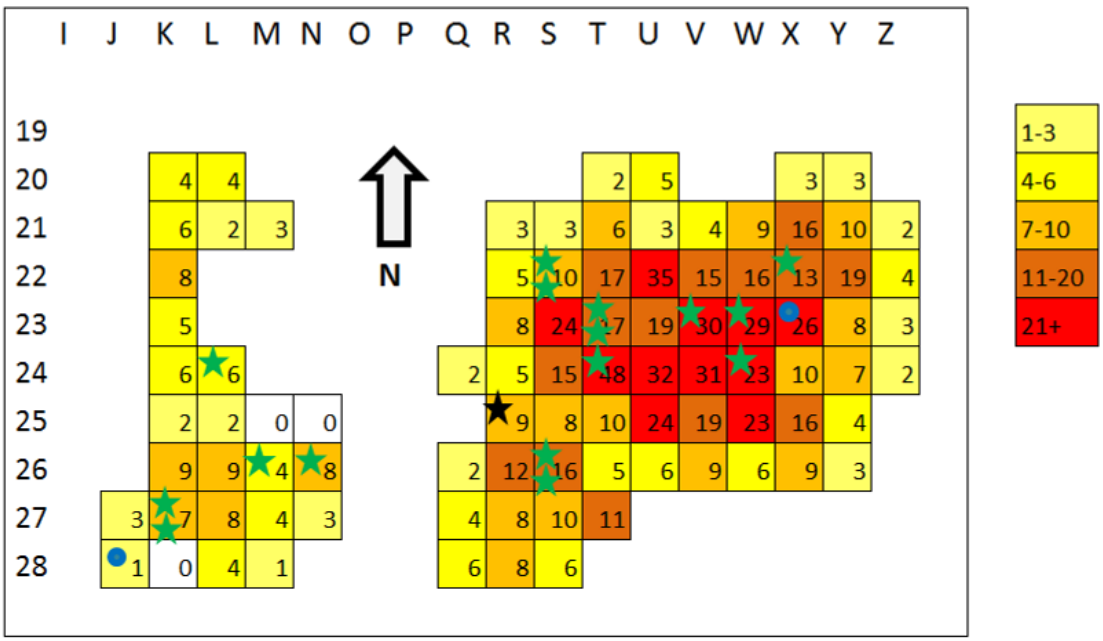


Figure 13: *Density distribution of all stone artefacts at KGP2014/006. The green stars denote quartz backed tools, the black star the CCS adze, and the blue circles are the hammer stone/upper grindstones.*

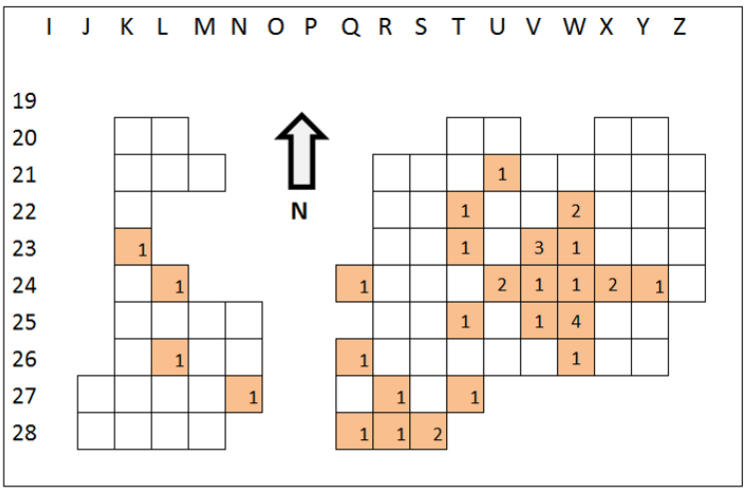


Figure 14: *Distribution of background scatter artefacts at KGP2014/006.*

Figure 15: *MSA flake reused as a core during the LSA occupation.*

The stone materials were no doubt all locally obtained. The quartz includes many cortical flakes that show the wind abraded surface of nodules collected from the Bushmanland gravels. The quartzite also shows old, weathered surfaces, often patinated to a red-brown colour despite the generally dark grey interior of most of the quartzite. During the Phase 1 surveys it was noted that many larger quartzite rocks had been flaked *in situ* with the flakes likely carried away (Orton 2011, 2014; Orton & Webley 2014). This indicates local sourcing of rock.

6.2.2. Ostrich eggshell

Ninety generally very small ostrich eggshell fragments were found spread across the site, but mostly concentrated in the same areas as the flaked stone artefacts (Figure 16). They had a cumulative weight of just 16.8 g. This is only a very small amount of shell since a whole eggshell weighs in the region of 230 to 250 g (Kandel 2004; Orton 2008). A single engraved fragment was found (Figure 17). It is quite weathered, indicating exposure for a far longer period of time than at, for example, KGP2014/008 (see below). Decoration is usually placed on ostrich eggshell water flasks, but no evidence of a flask opening was found in the collection from the site. The engraved pattern is very similar to other such patterns found across western South Africa (Orton 2012; I. Rudner 1953).

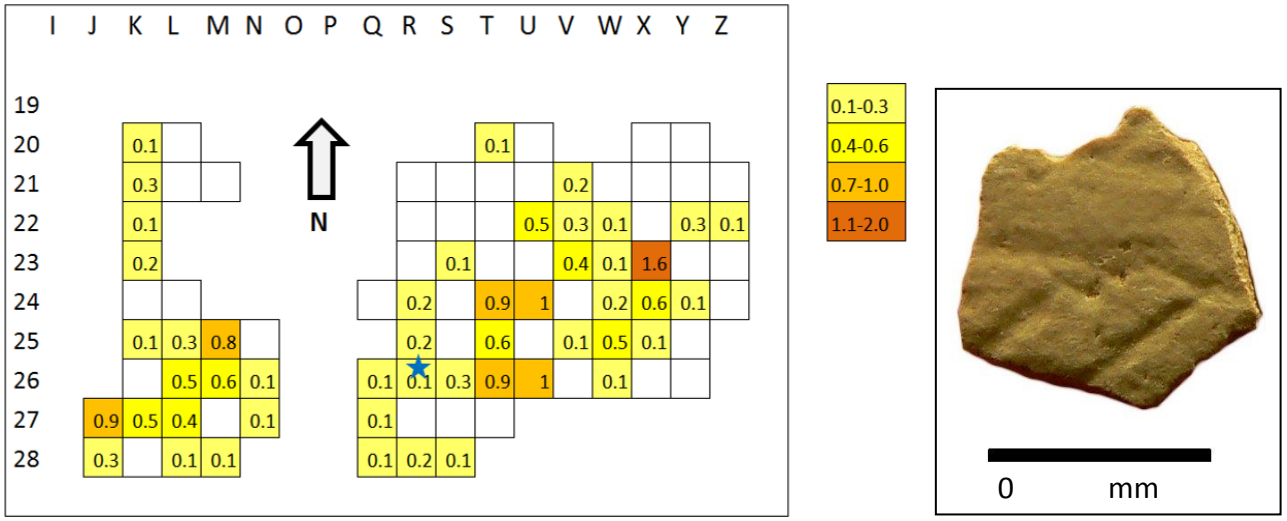


Figure 16: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/006. The blue star indicates the location of the single engraved fragment found on the site.*

Figure 17: *Engraved fragment of ostrich eggshell from the main part of KGP2014/006.*

6.2.3. Animal bone

A number of very small fragments of animal bone were found at the site. They were too small and weathered to identify, although two might possibly be tortoise bone. The majority of the remainder were splinters of one or more long bones. Figure 18 shows their distribution across the site – they were restricted to the main part of the site in the east.

6.2.4. Freshwater shell

Two conjoining fragments of the freshwater mussel, *Unio caffer*, were found in the main part of the site (Figure 18). The shell must have been brought from the Orange River some 60 km distant.

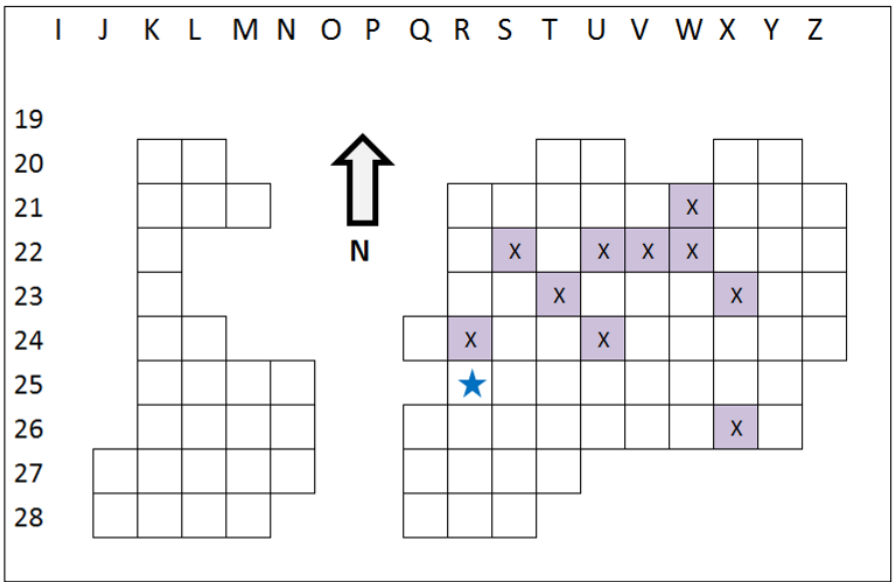


Figure 18: *Distribution of bone fragments (X) at KGP2014/006. The blue star indicates the location of two fragments of freshwater mussel.*

6.3. KGP2014/008

KGP2014/008 also presented as two discrete scatters of archaeological material. At this site 60 m^2 (38 m^2 in the north and 22 m^2 in the south) were excavated from the two patches (Figure 19). The site lies at and just beyond the south-western end of an area with relatively little vegetation that extends in an east-north-easterly direction from the northern patch (Figure 20). The southern part of the site is in a slightly bushier area, but is still less bushy than the general surroundings (Figure 21).

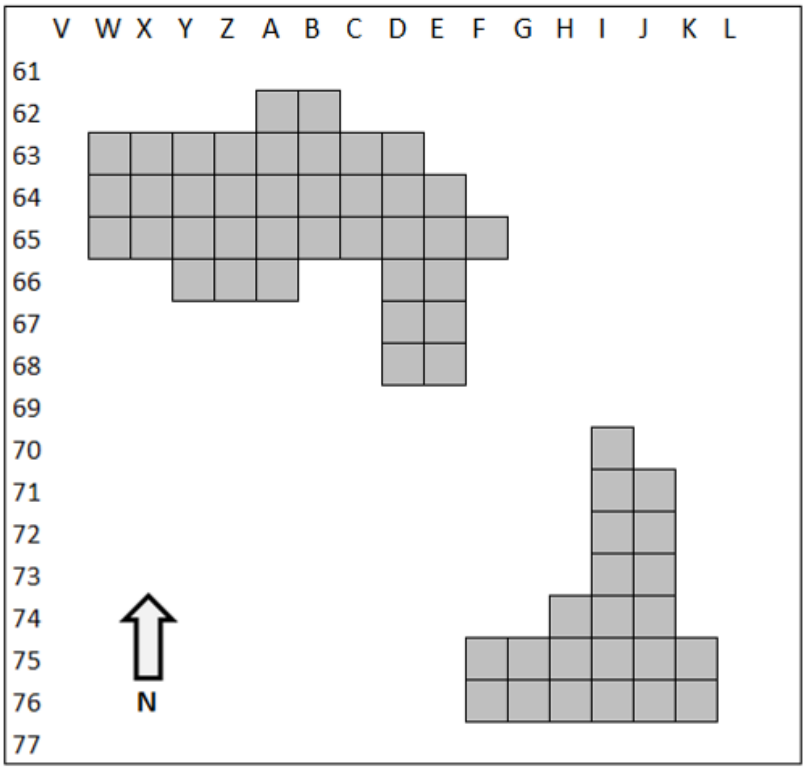


Figure 19: *Map of the excavated area at KGP2014/008. All squares are 1 m^2.*

Figure 20: *View towards the west over the northern patch of KGP2014/008.*

Figure 21: *View towards the west over the southern patch of KGP2014/008.*

6.3.1. Stone artefacts

Table 2 presents a typological analysis of the 213 flaked stone artefacts found at the site. The assemblage is relatively informal. There were many larger chunks, which showed no evidence of having been part of flakes. Only one backed bladelet was found, while adzes were more common. Two of these were made on older flakes, of which one, in quartz, was so heavily weathered that it is not entirely certain that it was originally a flake. The second, on CCS, has had perhaps half of the original flake removed by the more recent working. The last adze was made on a freshly struck CCS flake and has original pebble cortex opposing the working edge (Figure 22). Also among the retouched component was a very tiny thumbnail scraper that was made on an older flake, probably originally an edge-damaged flake. A small amount of retouch has been added to the working edge to turn it into a thumbnail scraper. It is somewhat scruffy in appearance, perhaps because of being so small (Figure 22). The single quartzite miscellaneous retouched piece is a large flake with several small scars evident along its margins. Although they could have been the result of use, they seem too large to not have been made deliberately. Figure 23 shows the density of stone artefacts across the site. It can be seen, particularly from the hammer stones, grindstones and anvils, that the majority of the activity occurred on the northern part of the site. Besides the reused flakes already noted, there are several other instances of reuse of older artefacts. Figure 24 shows a quartzite core – probably dating from the MSA – which was collected and flaked further during the LSA occupation. Three of the five quartzite edge-damaged flakes are older flakes that were collected and reused as is, resulting in fresh damage to the edges of the flakes.

Table 2*: Typological analysis of flaked stone artefacts from KGP2014/008.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Bipolar core		1			1			
Single platform core	1	1	1			1		
Radial core	1							
Irregular core	2	5						
Backed bladelet	1							
Thumbnail scraper			1					

Adze	1		1					
Miscellaneous retouched piece		1						
Edge-damage flake	1	5				1	1	
Blade		2			1			
Bladelet	4		1					
Flake	64	42	7	2	2	2		1
Chunk	13	14	1				1	
Chip	30	7	2			1		
Total per stone material	**118**	**78**	**15**	**2**	**4**	**5**	**2**	**1**
% of stone material	**55.4**	**35.7**	**7.0**	**0.9**	**33.3**	**41.7**	**16.7**	**8.3**

In addition to the flaked assemblage, several non-flaked stone artefacts were recovered. These include an upper grindstone, two upper grindstones also used as hammer stones (Figure 25), an upper grindstone also used as an anvil, two lower grindstones (Figure 26), and a lower grindstone also used as an anvil (Figure 27).

Again, all the stone materials appear to be local, although the single hornfels flake in the background scatter assemblage may have been carried to the area from further south, since hornfels sources were not observed in the study area – this is no doubt why this stone type does not feature in the LSA assemblages.

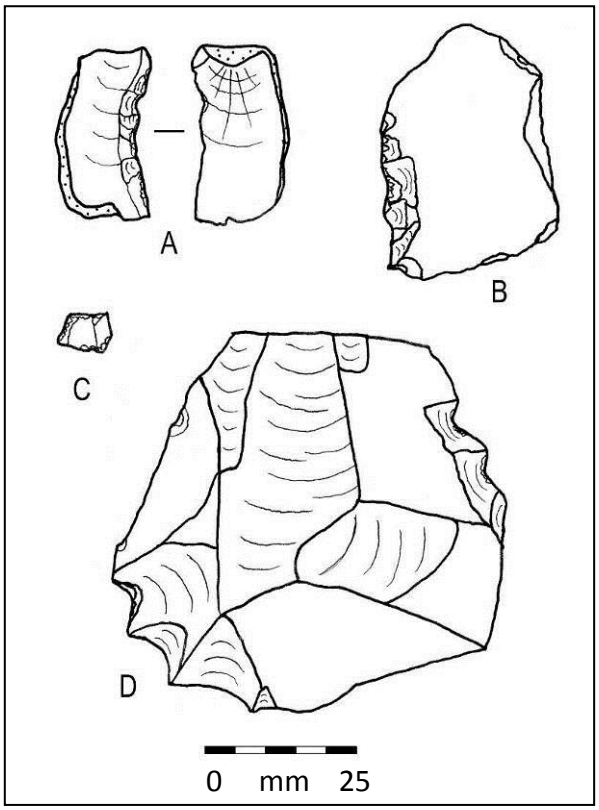


Figure 22: *Retouched artefacts from KGP2014/008. A: adze (CCS) with stippling denoting cortex; B: adze (quartz) on an older flake; C: thumbnail scraper (CCS) on an older flake; D: miscellaneous retouched piece (quartzite).*

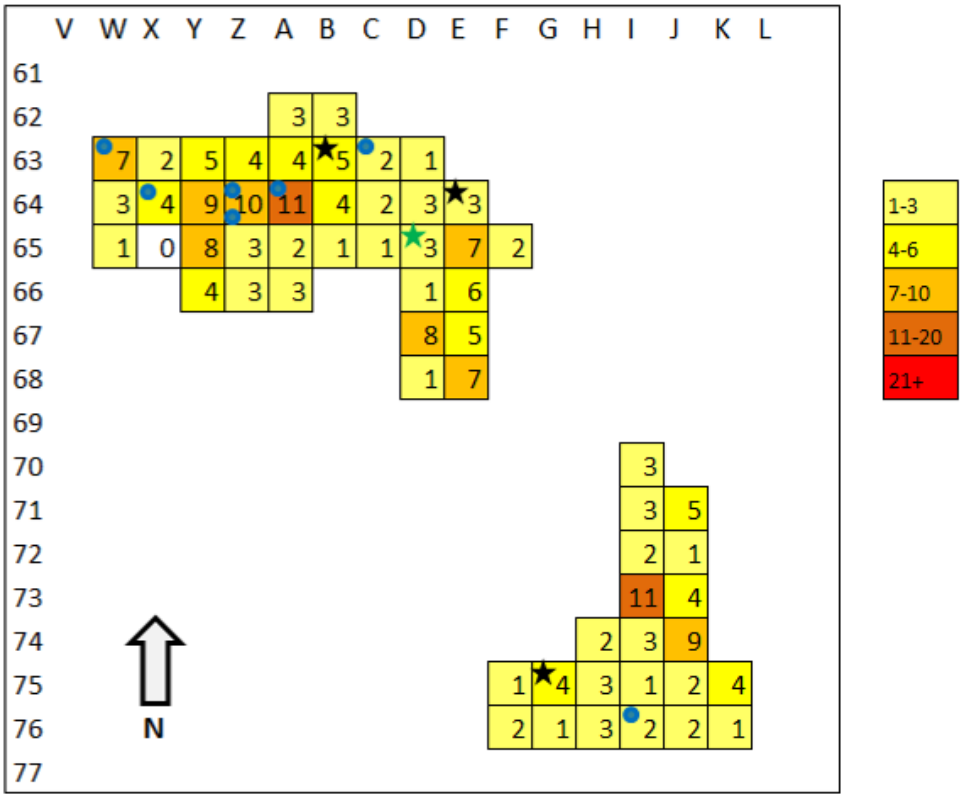


Figure 23: *Density distribution of all stone artefacts at KGP2014/008. The green star denotes a quartz backed bladelet, the black star the CCS adze, and the blue circles are the hammer stone/upper grindstones.*

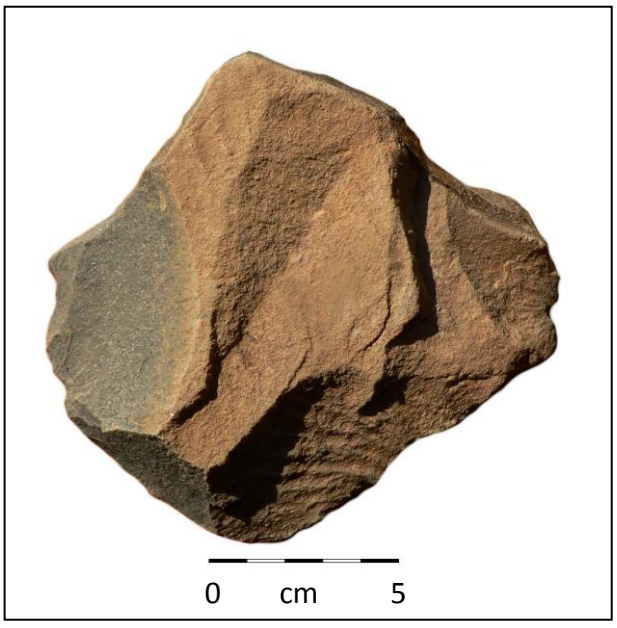


Figure 24: *Reused quartzite core from KGP2014/008. Older, patinated scars are visible on the right while newer, dark coloured scars are visible on the left.*

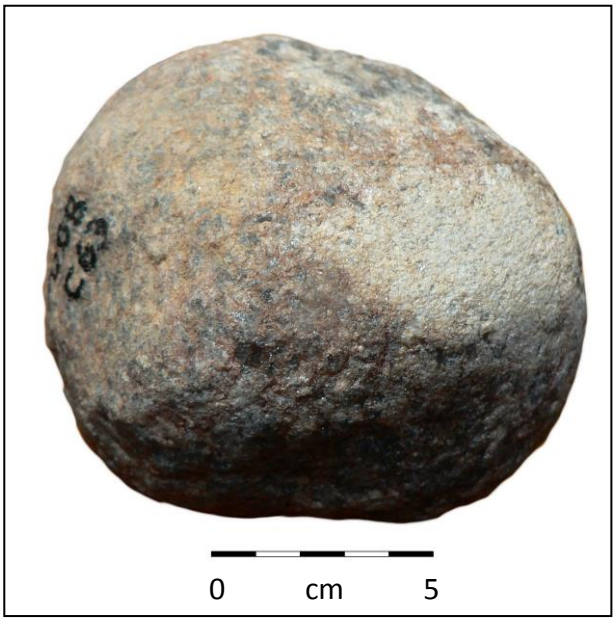


Figure 25: *Upper grindstone/hammer stone made on a very coarse-grained cobble.*

Figure 26: *Lower grindstone still* in situ *at KGP2014/008. It is 30 cm long.*

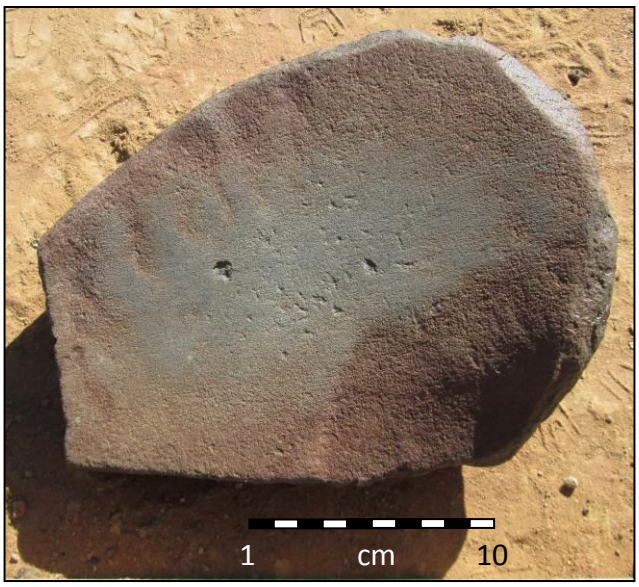


Figure 27: *Lower grindstone with anvil damage to its surface from KGP2014/008.*

6.3.2. Ostrich eggshell

Although far more ostrich eggshell was present on this site than was the case at KP2014/006, the total weight of eggshell at 68.5 g (196 fragments) is still only about one quarter of the weight of a whole shell. Again, no flask mouth fragments were found, although one clearly engraved fragment and another that was quite likely engraved were found in the northern part of the site (Figures 28 & 29).

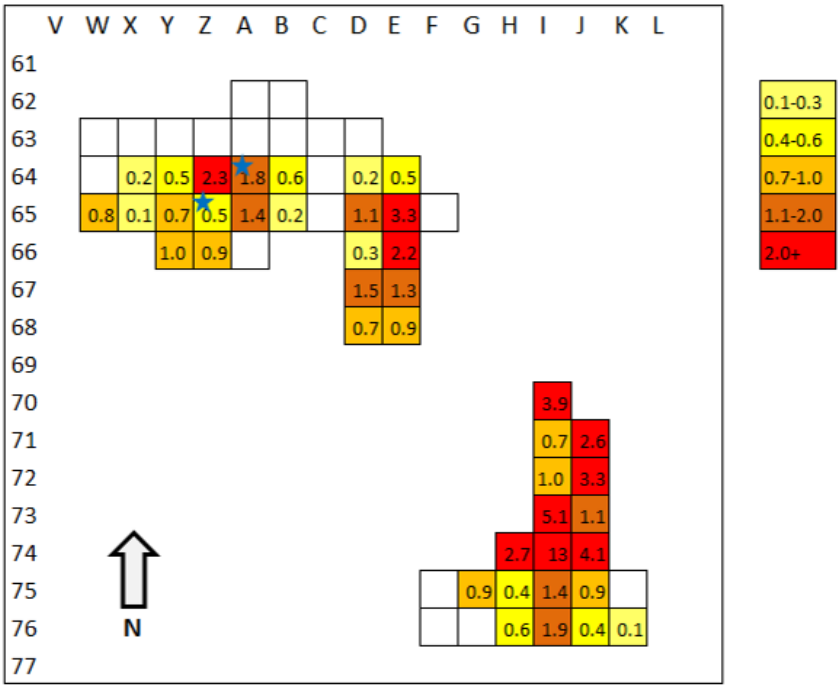


Figure 28: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/008. The blue star indicates the location of the two engraved fragments found on the site.*

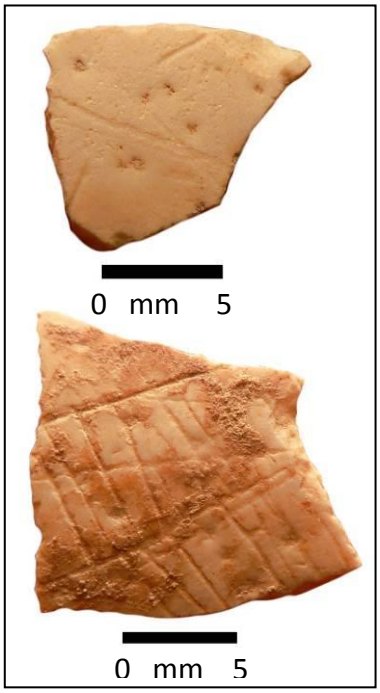


Figure 29: *Engraved fragments of ostrich eggshell from the northern part of KGP2014/008.*

6.3.3. Animal bone

Many small fragments of animal bone were found on the northern scatter (Figure 30). Many of them appear to be small fragments of tortoise bone, while a few tooth fragments may belong to a small bovid. The only other identifiable bone was the distal end of a tibia, probably belonging to a small carnivore such as a cat (T. Steele, pers. comm. 2014). Two fragments of bone were burnt. Here was no bone on the southern scatter.

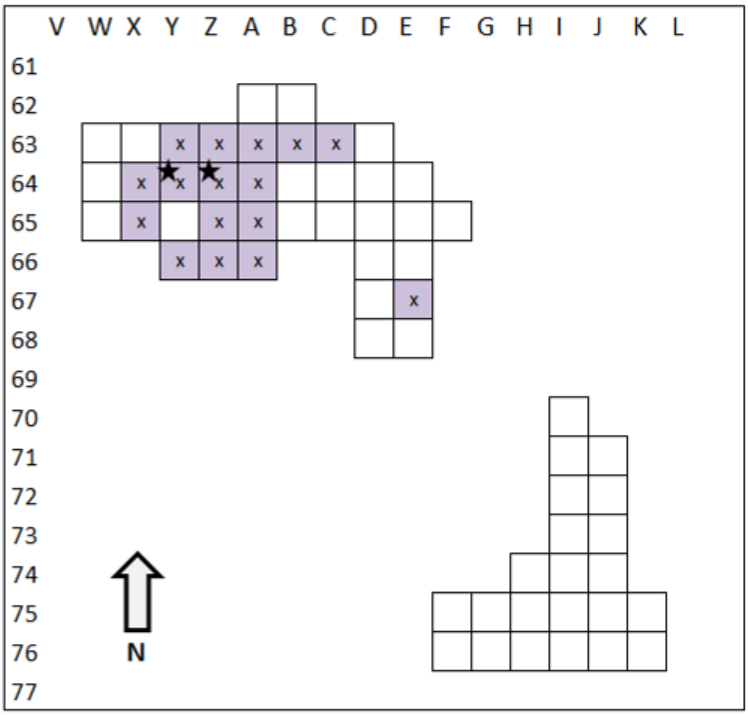


Figure 30: *Distribution of bone fragments (X) at KGP2014/008. The black stars indicate the location of the two fragments of burnt bone.*

6.4. KGP2014/009

This site has a fairly small excavation which covered 29 m^2 (Figure 31). The site lay in an area with less vegetation than the general surroundings (Figure 32). The substrate is sandy and this sandy area was found to be completely surrounded by gravel.

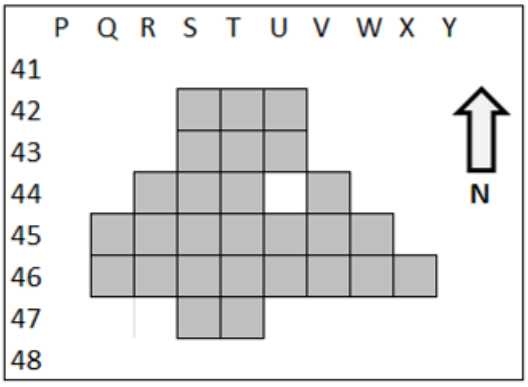


Figure 31: *Map of the excavated area at KGP2014/009. All squares are 1 m^2.*

Figure 32: The site and surroundings at KGP2014/009.

6.4.1. Stone artefacts

This site has a small collection of 136 artefacts. Table 3 provides the typological analysis of the assemblage. There seems to be a disproportionately high frequency of quartzite cores which might indicate production of flakes that were carried off for use elsewhere. The radial and single platform cores demonstrate a degree of care in terms of core maintenance (Figure 33), but as is commonly the case, irregular cores predominate. The single platform core in 'other' was of a stone type not seen among the flakes, so this artefact (which also happens to be a lower grindstone/anvil – see below) may also have produced flakes that were removed from the site. The retouched component comprises of two quartz backed bladelets and one CCS adze, the latter made on a recently struck flake. The adze is unusual in that it has been retouched and used on all four sides (Figure 34). There was no evidence of reuse of older artefacts at this site.

***Table 3**: Typological analysis of flaked stone artefacts from KGP2014/009.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Single platform core		2		1				
Radial core		1						
Irregular core	1	5						
Backed bladelet	2							
Adze			1					
Edge-damage flake			1			1	2	
Blade	1							
Bladelet	1	1						
Flake	50	21	6	2				
Chunk	7	5	1				1	
Chip	26	2					1	
Total per stone material	**37**	**88**	**9**	**2**	**0**	**1**	**4**	**0**
% of stone material	**64.7**	**27.2**	**6.6**	**1.5**	**0**	**20**	**80**	**0**

Figure 33: *Quartzite single platform core from KGP2014/009. Its platform diameter (upper surface in the photograph) is about 6 cm. Flakes have been struck in the same direction from all around the perimeter of the platform.*

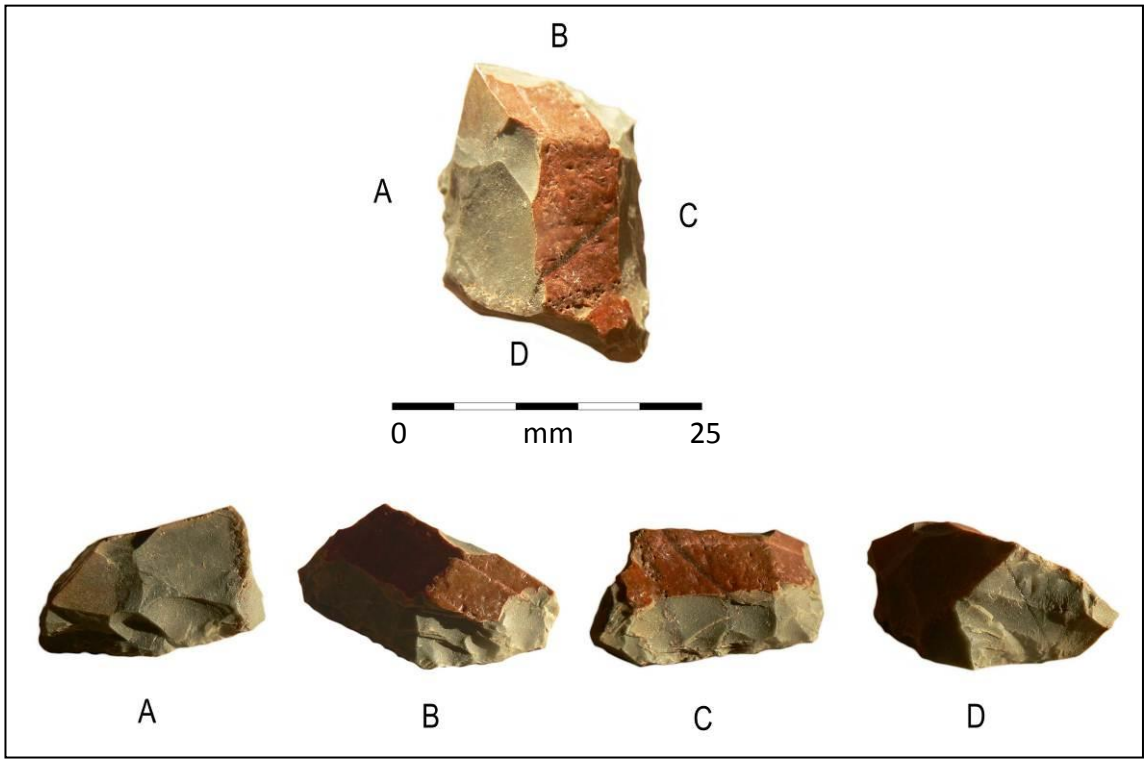


Figure 34: *The CCS adze from KGP2014/009. The scale applies to the plan view image only. The four side views show the worked edges as labelled.*

The stone artefacts are distributed across the entire site, although there is a concentration in the south-eastern area. Despite this, retouched tools and non-flaked artefacts tend to be to the west (Figure 35). Besides the flaked artefacts discussed above, the site also produced a lower grindstone and another artefact used on both surfaces as an anvil and on one surface as a lower grindstone (Figure 36). Interestingly, it has also been flaked as one of the single platform cores. The artefact has been so well used that a pronounced depression has formed on both surfaces, but particularly that displaying grinding and anvil damage.

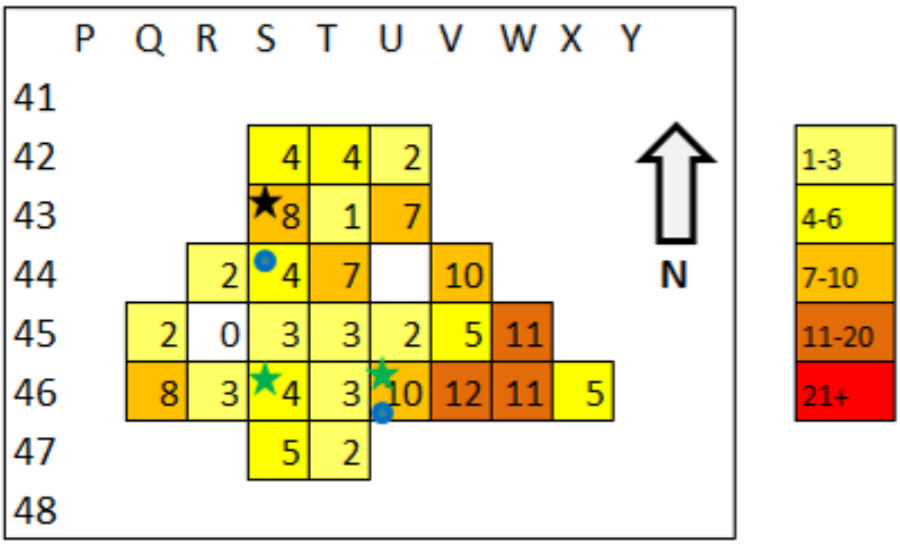


Figure 35: *Density distribution of all stone artefacts at KGP2014/009. The green stars denote quartz backed bladelets, the black star the CCS adze, and the blue circles are the lower grindstone and anvil/lower grindstone/single platform core.*

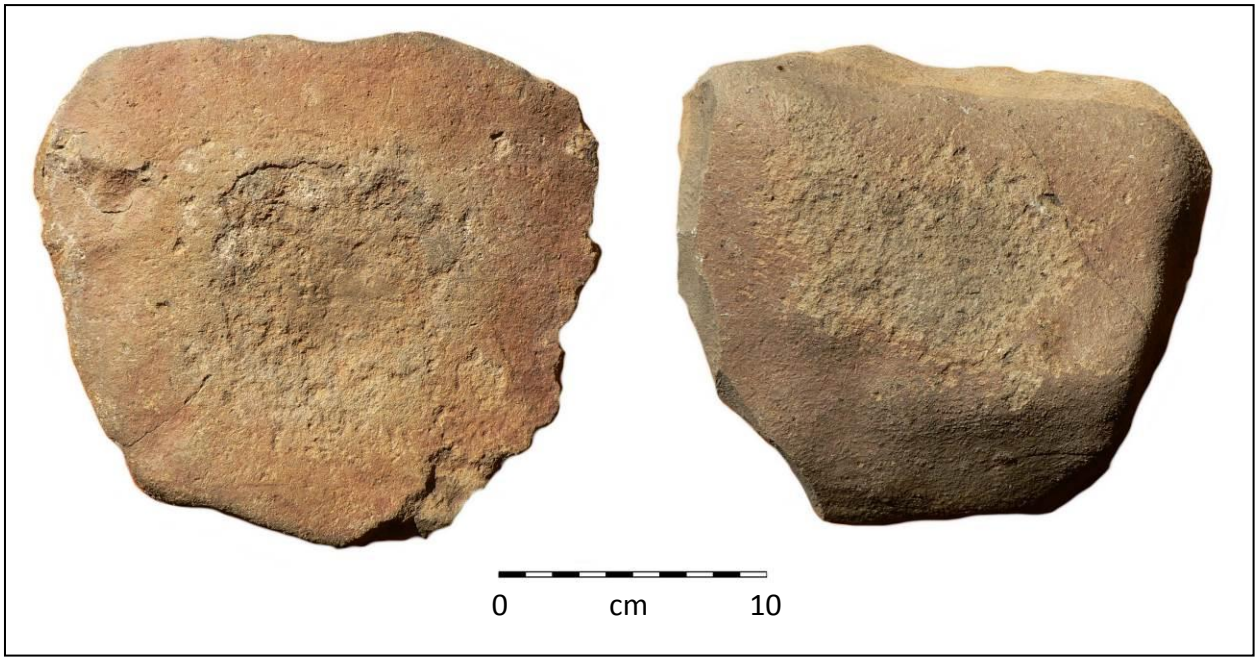


Figure 36: *The lower grindstone/anvil/single platform core from KGP2014/009. The left hand view shows the ground surface, while the flaked edge is towards the centre on both views.*

6.4.2. Ostrich eggshell

Not much ostrich eggshell was found on this site. The total quantity weighed just 5.7 g (19 fragments). There were two clusters of fragments, but that in the east, where stone artefacts are also most numerous, is denser (Figure 37). A single fragment of engraved ostrich eggshell was found (Figure 38).

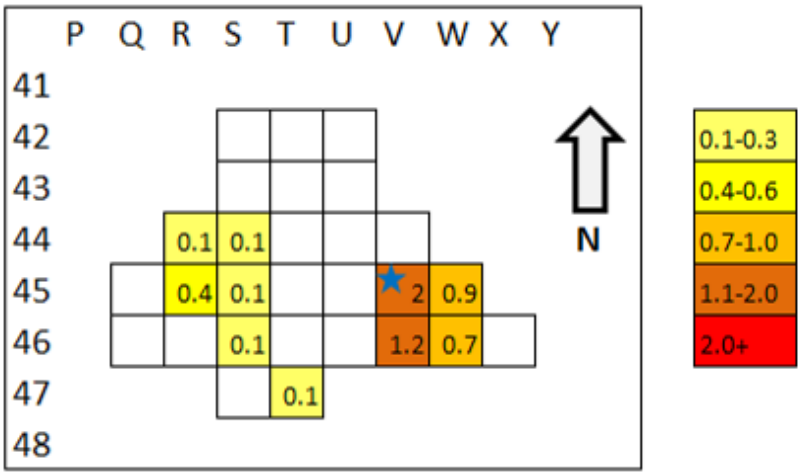


Figure 37: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/009. The blue star indicates the location of the engraved fragment found on the site.*

Figure 38: *Engraved fragment of ostrich eggshell from KGP2014/009.*

6.4.3. Animal bone

Just one small fragment of bone was found on the site, in square U42. It is not diagnostic.

6.5. KGP2014/011

This small site had 28 m^2 excavated from it (Figure 39). It lay in a slightly more bushy area than the other sites with bush unfortunately making further excavation towards the south difficult.

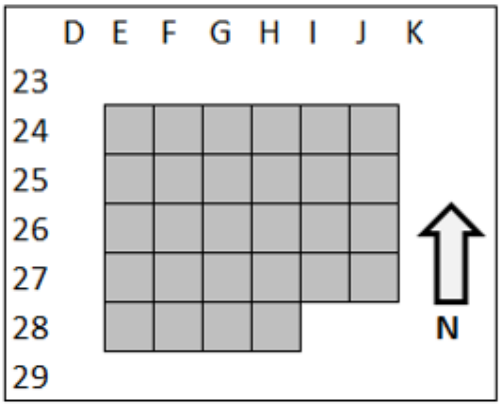


Figure 39: *Map of the excavated area at KGP2014/011. All squares are 1 m^2.*

6.5.1. Stone artefacts

Table 4 presents a typological analysis of the 287 flaked stone artefacts from the site. It was an interesting assemblage which included scrapers, backed tools and an adze. One of the two scrapers found here was broken but the other was a small thumbnail scraper (Figure 40). The adze was made on an older cortical flake and the ventral scarring typically found on adzes is clearly visible on this example (Figure 41). The quartzite miscellaneous retouched piece (MRP) is a large, older flake that has been flaked further during the LSA (Figure 42). Although it is bifacially worked,

the majority of the removed flakes are very small, far smaller than the typical quartzite flakes recovered from the excavation, hence the designation an as MRP rather than a core. Figures 43 to 45 show some of the variety in the quartzite cores. Note, in particular, the great difference between the irregular cores in Figures 44 and 45 which have minimal and extensive flaking respectively.

***Table 4**: Typological analysis of flaked stone artefacts from KGP2014/011.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Bipolar core	2							
Single platform core	2	2						
Single platform bladelet core								
Irregular core	3	8		1				
Backed bladelet	2							
Backed point	1							
Backed bladelet fragment	1							
Backed point fragment	1							
Thumbnail scraper		1						
Scraper fragment		1						
Large chopper		1						
Adze			1					
Miscellaneous retouched piece		1						
Edge-damage flake		1				2		1
Edge-damage chunk			1					
Blade	3	1						
Bladelet	10							
Flake	113	37	1	3		4		
Chunk	27	7	1			1		
Chip	53		1		1		1	
Total per stone material	**58**	**220**	**5**	**4**	**1**	**7**	**1**	**1**
% of stone material	**76.7**	**20.2**	**1.7**	**1.4**	**10**	**70**	**10**	**10**

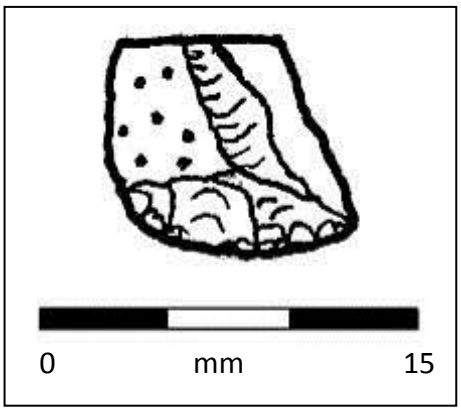


***Figure 40:** Quartz thumbnail scraper from KGP2014/011.*

Figure 41: *CCS adze from KGP2014/011. Dorsal (left) and ventral (right) views are shown below with the use damage arrowed. The upper view shows the working edge.*

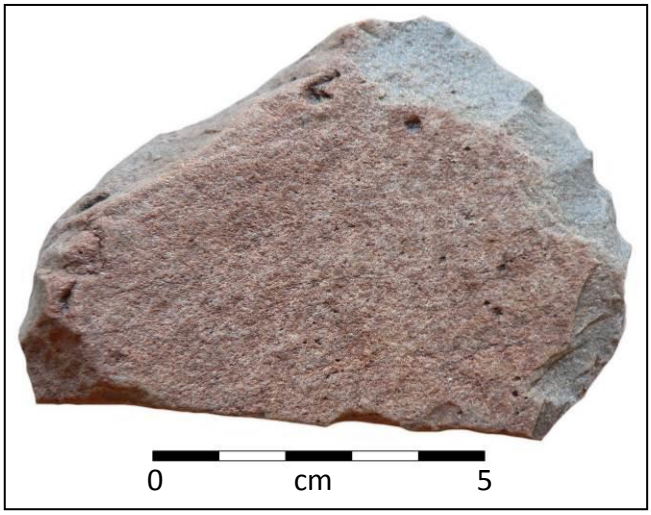


Figure 42: *The quartzite miscellaneous retouched piece from KGP2014/011.*

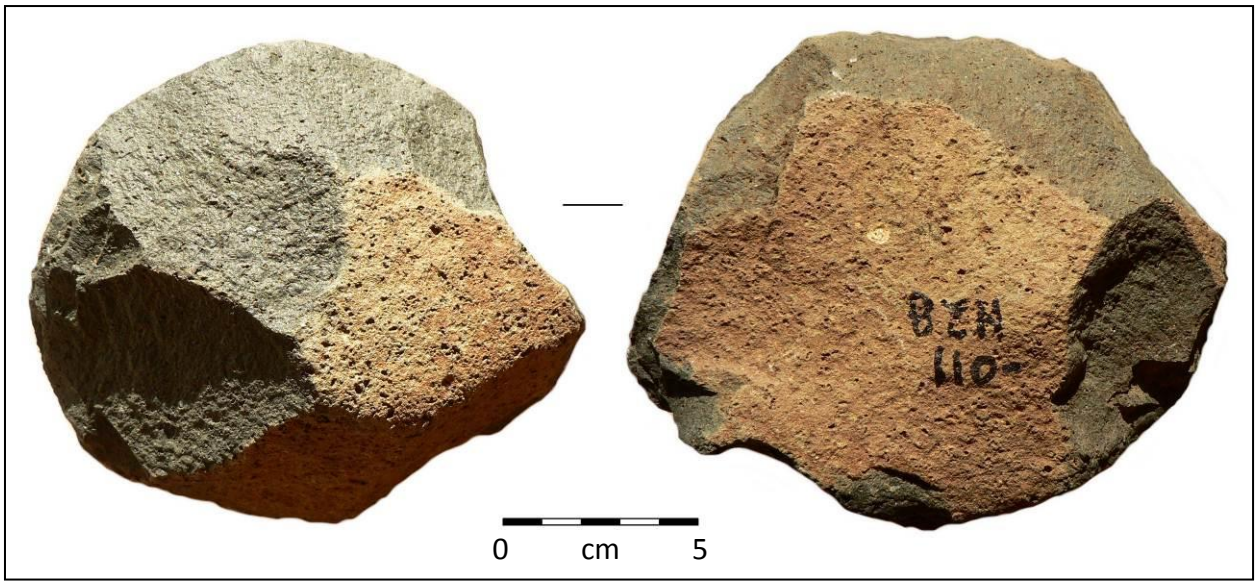


Figure 43: *Opposite sides of a quartzite radial core from KGP2014/011.*

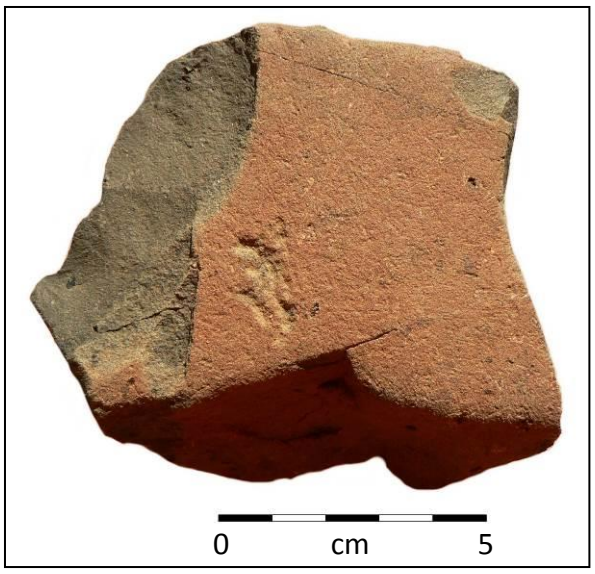


Figure 44: *Quartzite irregular core from KGP2014/011 displaying only a few flake removals from one end.*

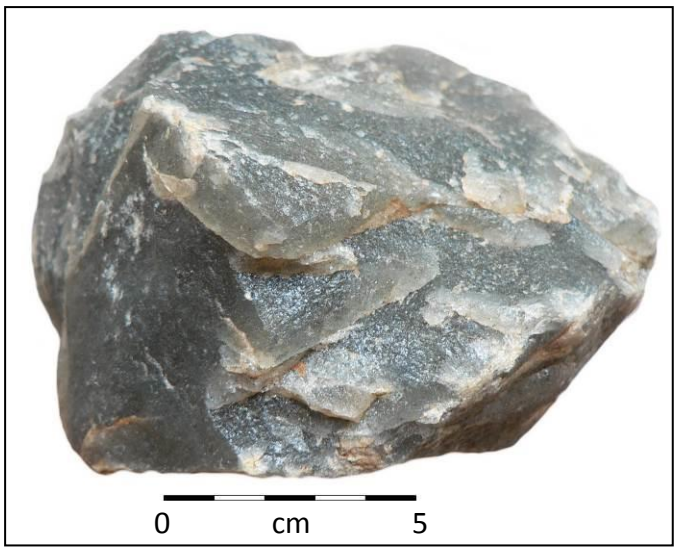


Figure 45: *Quartzite irregular core which has been flaked over its entire surface.*

The majority of stone artefacts are located towards the southern part of the excavated area where there is a clear centre of activity (Figure 46). The retouched artefacts are all in and around this area, as are the two anvils. One anvil is only very lightly used, perhaps reflecting just a single episode of use (Figure 44), but the other was far more heavily used (Figure 45). Anvils would typically have been used during bipolar flaking, but other types of cores were also likely rested on anvils when struck.

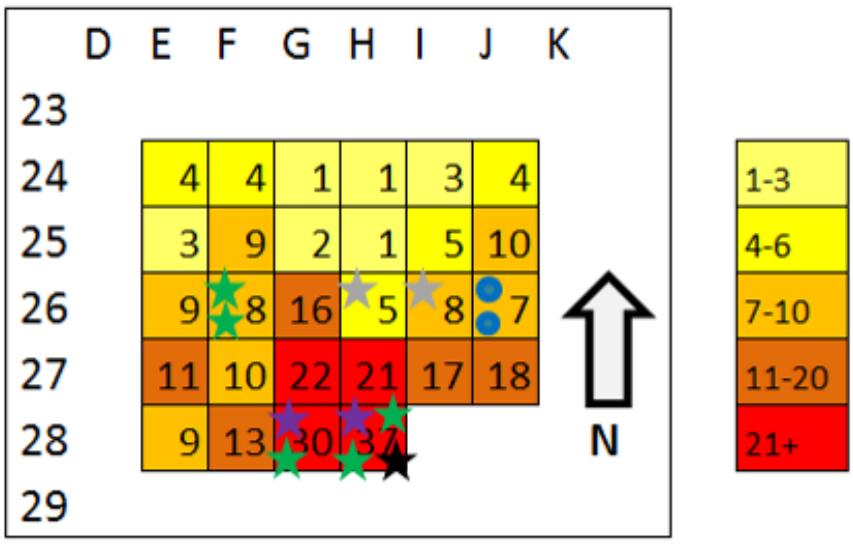


Figure 46: *Density distribution of all stone artefacts at KGP2014/011. The green stars denote quartz backed bladelets, the purple stars denote quartz scrapers, the black star the CCS adze, the grey stars are the quartzite chopper and MRP, and the blue circles are the anvils.*

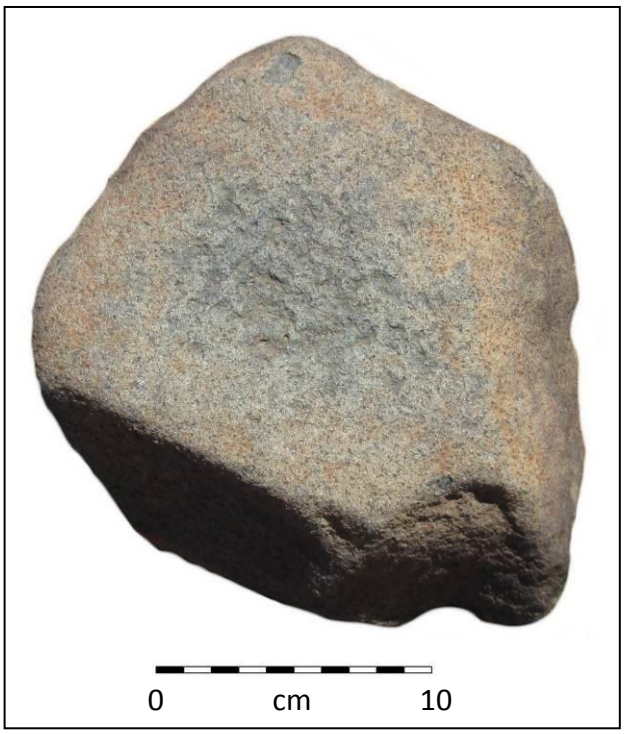


Figure 47: *Heavily used anvil from KGP2014/011. The extensive damage is visible in the centre of the pictured surface.*

6.5.2. Ostrich eggshell

The 81 fragments of ostrich eggshell from this site weighed 24.7 g and were distributed across the southern part of the excavated area. The density plot (Figure 48) mirrors that of the stone artefacts.

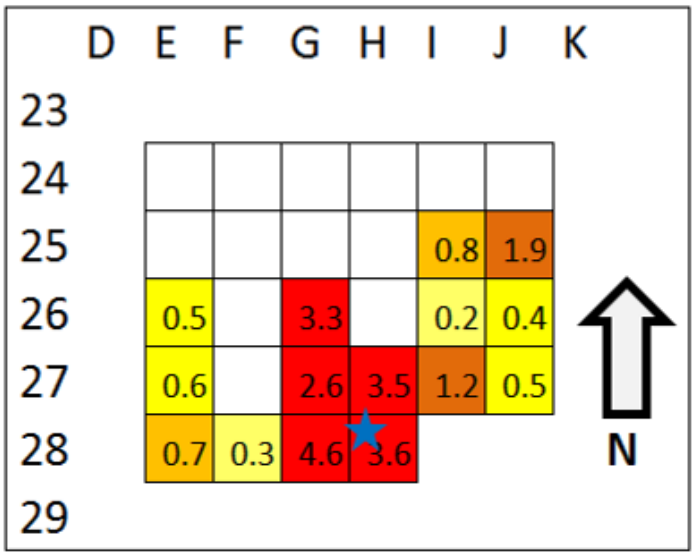


Figure 48: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/011. The blue star indicates the location of the engraved fragment found on the site.*

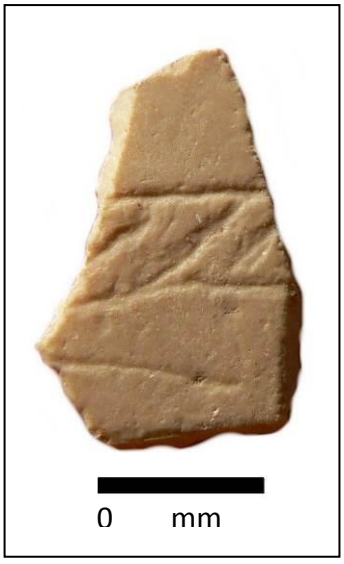


Figure 49: *Engraved fragment of ostrich eggshell from KGP2014/011.*

6.5.3. Animal bone

Many small fragments of bone were found on the site, again clustered in the south. Tortoise bone and a tooth fragment were identified, while a micromammal vertebra – given its better state of preservation – is likely a more recent addition to the landscape.

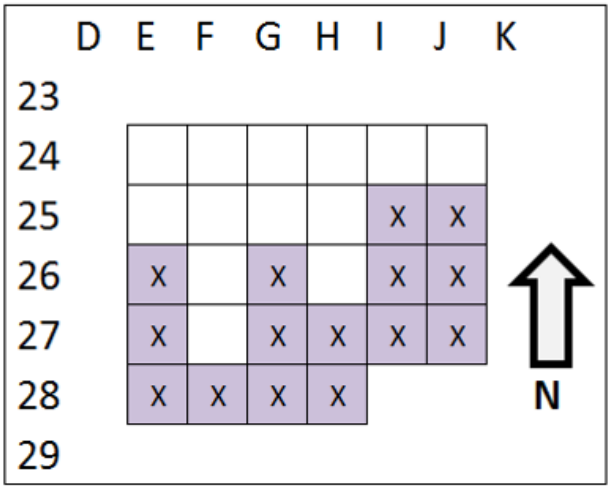


Figure 49: *Distribution of bone fragments (X) at KGP2014/011.*

6.6. KGP2014/013

This site lay in a sandy space with some larger bushes on its west and northern sides (Figure 50) and had 39 m^2 excavated from it (Figure 51). The bushes prevented further excavation in those directions because of the large amount of sand cover and vegetation. In the northern part of the site there was a cluster of cobbles that did not appear to be natural (Figure 52). On removing these, some of which turned out to be large cores and another a hammer stone, it was found that the hard silty surface was broken beneath them and some cultural material was present deeper down. The material from beneath the surface was removed separately.

Figure 50: *View over KGP2014/013 facing towards the west. The excavated area lies broadly within the tape measure.*

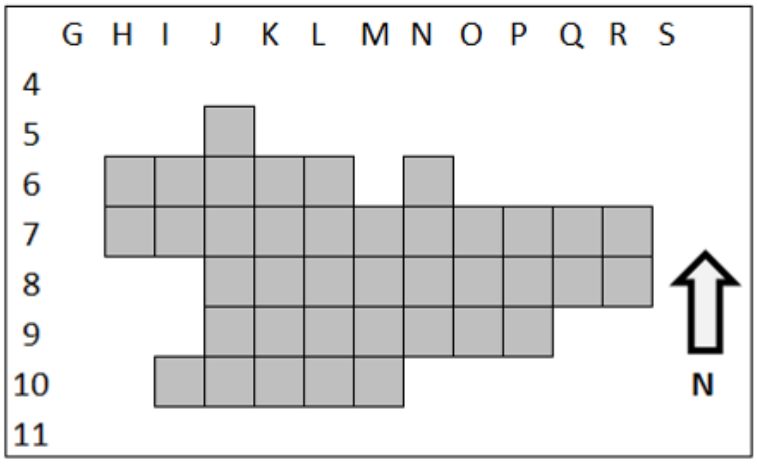


Figure 51: *Map of the excavated area at KGP2014/013. All squares are 1 m^2.*

Figure 52: *View towards the north showing the cluster of stones encompassed within square N6.*

6.6.1. Stone artefacts

The excavation yielded 355 flaked stone artefacts. Table 5 provides a typological analysis of the assemblage, which, because of a number of distinctive features, is quite different from those reported above. Unlike the other sites, quartzite is far more dominant with quartz and CCS assuming subservient roles and being equal in frequency. Among the artefacts made from 'other' materials, the blade is on hornfels. This was the only LSA hornfels artefacts found on any of the sites. Further very distinctive features of this assemblage are the presence of several scrapers among the formal component, the presence of a backed tool in a material other than quartz (in this case CCS), and the generally high frequency of retouched items in CCS rather than in quartz (Table 5; Figure 53). The MSA scraper (Figure 53:H) is heavily weathered and is part of the background scatter. It is also broken.

***Table 5**: Typological analysis of flaked stone artefacts from KGP2014/013.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Single platform core			2					
Single platform bladelet core	1							
Radial core		1						
Irregular core		5	2					
Irregular bladelet core			1					
Backed piece fragment	1							
Backed point fragment			1					
Thumbnail scraper			2					
Sidescraper			1					
MSA scraper						1		
Miscellaneous backed scraper			1					
Notched piece	1							
Large chopper		1						
Adze			2					
Edge-damaged blade				1				
Edge-damage flake			1		1	4	1	
Edge-damage chunk		1	2				2	
Edge-damaged chip							1	
Blade	1	4		1				
Bladelet		2	2					
Flake	38	154	38	2		2	1	
Chunk	8	43	8			2	1	
Chip	15	8	3				1	
Total per stone material	**66**	**219**	**66**	**4**	**1**	**9**	**7**	
% of stone material	**18.6**	**61.7**	**18.6**	**1.1**	**5.9**	**52.9**	**41.2**	

The large chopper, in quartzite, is an interesting piece (Figure 53:I). It started out as an unmodified cobble that was used on one of its sharp edges as a chopping tool. Figure 54 shows this edge. It is the upper edge as portrayed in Figure 53. The artefact was also used as an anvil, although it is possible that this damage resulted from use as a hammer stone, but on its flat side rather than on an end as in normally the case. The chopper is listed in Table 5 because one or two flakes have also been removed from one edge. Non-flaked artefacts include two hammer stone/upper grindstones and one anvil. One of the former is illustrated in Figures 55 and 56. It was a long pebble, ground lightly on one surface but used on its end as a hammer stone until the entire thing split down the middle. One end of the recovered half is also missing. Figure 57 shows a density plot of all the stone artefacts found on the site. The plot shows the artefacts to be well spread across the site, although there is clearly a band of focused activity running from southwest to northeast. Had the excavation not been hampered by large bushes and sand cover then a clearer understanding of the site layout would have been obtained. In square N6 where subsurface deposits were excavated, 16 of the artefacts were on the surface with a further 9 from below the surface.

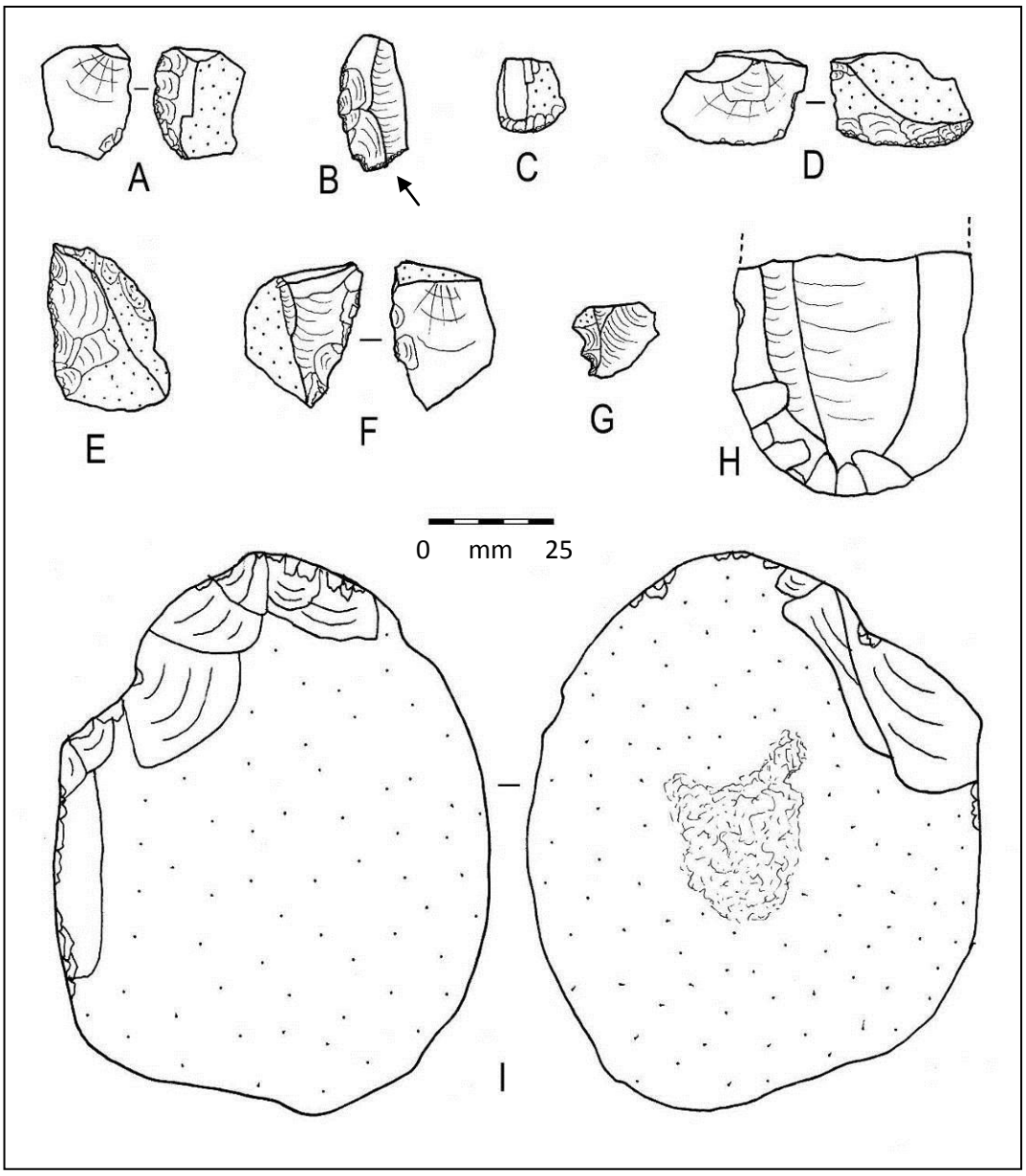


Figure 53: *Stone artefacts from KGP2014/013. A: sidescraper (CCS); B: miscellaneous backed scraper (CCS, arrow indicates short backed portion); C: thumbnail scraper (CCS); D: large thumbnail scraper (CCS); E: adze (CCS); F: adze (CCS); G: notched piece (quartz); H: MSA scraper (quartzite, background scatter); I: large chopper/hammer stone (quartzite). Stippling denotes cortex.*

Figure 54: *View directly onto the used edge on the large chopper. It has been extensively battered through use.*

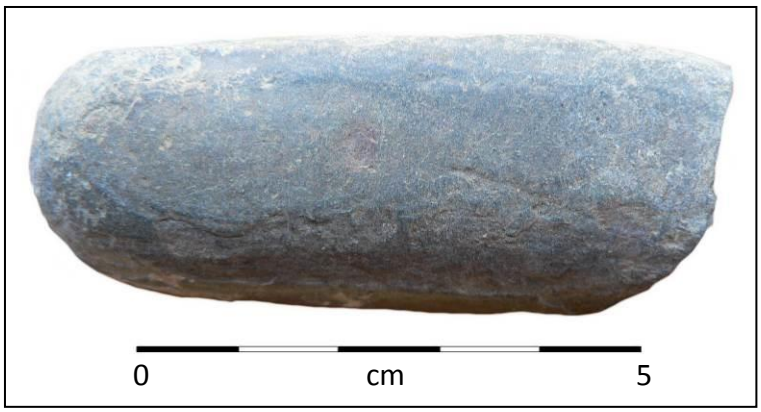


Figure 55: *A hammer stone/upper grindstone from KGP2014/013. The right hand end is broken and the left end was hammered. The ground surface is in view.*

Figure 56: *The hammered end of the artefacts in Figure 54. The split is at the top of this view.*

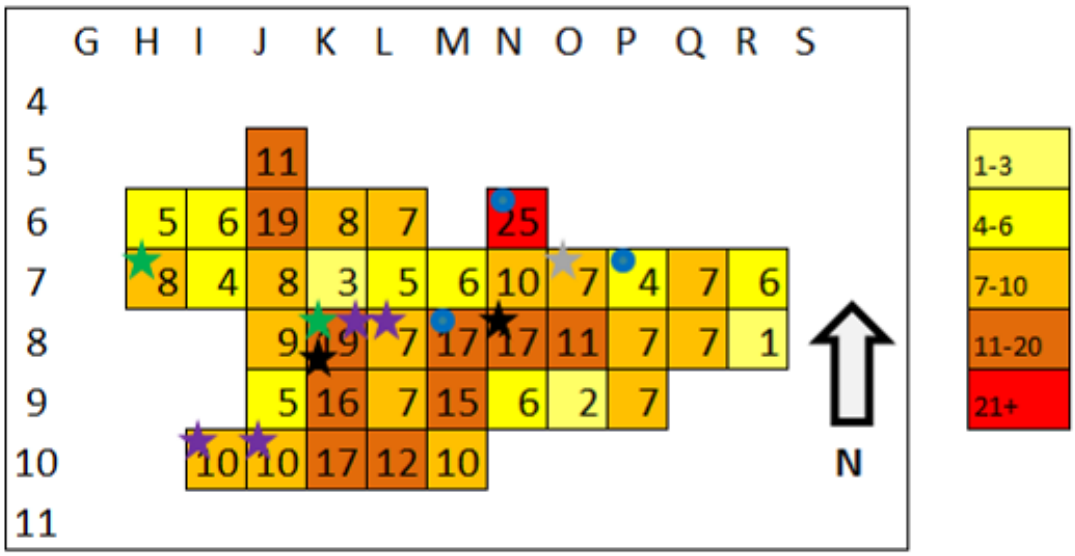


Figure 57: *Density distribution of all stone artefacts at KGP2014/013. The green stars denote backed artefacts (one in quartz and one in CCS), the purple stars denote CCS scrapers, the black stars the CCS adzes, the grey star is the quartzite chopper/anvil, and the blue circles are the hammer stone/grindstones and the anvil.*

6.6.2. Pottery

Three sherds of pottery weighing 15.6 g were recovered from this site from squares I6, J8 and P9. Two of them show clear signs of fibre temper along with mineral temper (Figure 58 & 59), while the third appears to contain only mineral temper. It is possible that this last is just a fragment of pottery that does not display any outward signs of fibres in the fabric. None of the sherds refits with the others. Their thicknesses are 9.1 mm, 6.3 mm and 6.3 mm respectively.

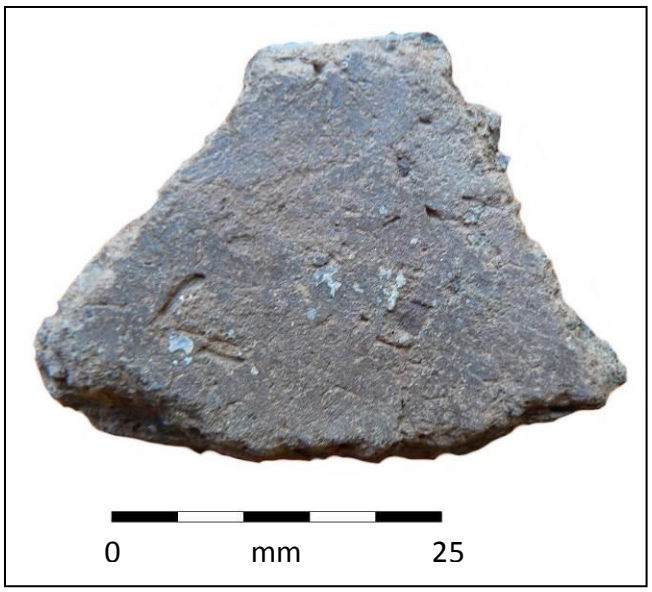


Figure 58: *The largest potsherd from KGP2014/013 showing clear indications of both mineral and fibre temper.*

Figure 59: *Edge view of the large potsherd showing the elongated spaces left behind after firing has burnt up the grass.*

6.6.3. Ostrich eggshell

This site produced 301 fragments of ostrich eggshell weighing 90.7 g altogether (Figure 60). The fragments were concentrated towards the northwest, but quite a lot came from below the surface in square N6 (8.9 g of the 11 g in the square). Burnt fragments were present in three squares: J6, K7 and N6 (Below Surface). Two engraved fragments were found (Figures 61 & 62). Both have parallel lines with parallel diagonals in between and one fragment (Figure 62) shows that the original shell had more than one set of such designs. There was also a single flask mouth fragment found near the southern edge of the excavation.

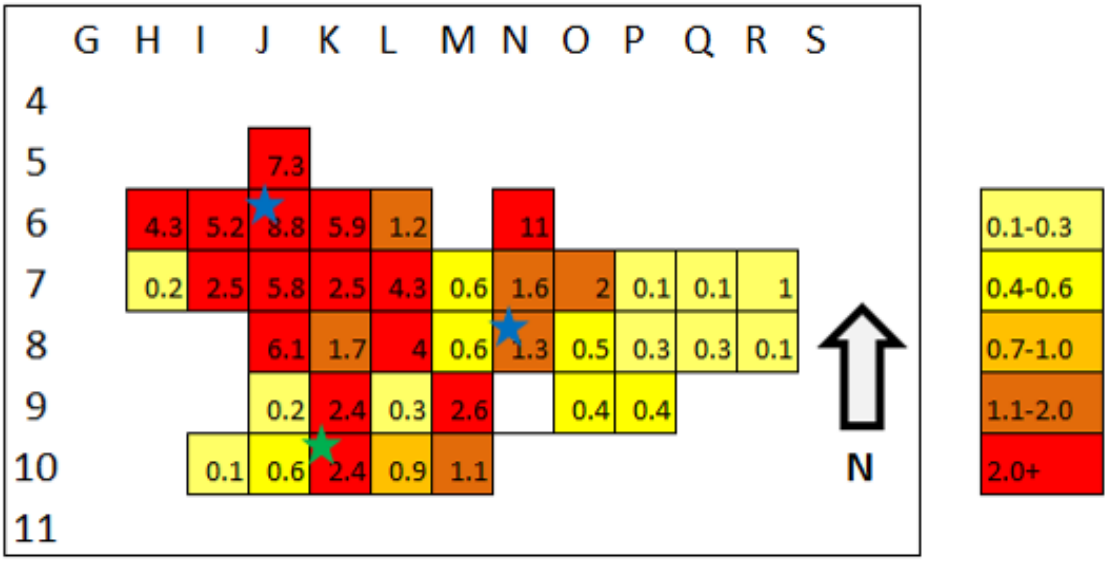


Figure 60: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/013. The blue stars indicate the locations of the engraved fragments found on the site and the green star denotes the flask mouth fragment.*

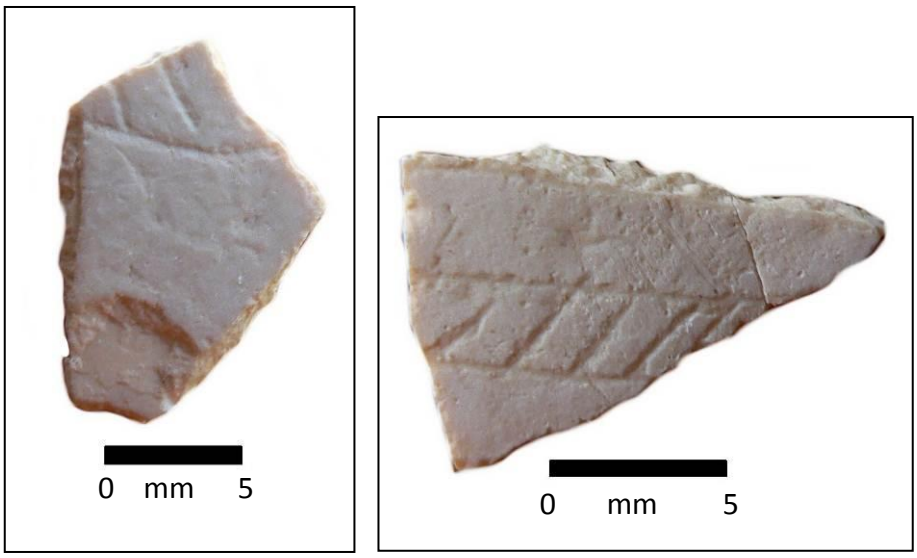


Figure 61 (left) & 62 (right): *The two fragments of engraved ostrich eggshell from KGP2014/013.*

6.6.4. Animal bone

Fragments of animal bone were recovered from across the site (Figure 63). The only identifiable pieces were some tooth fragments and a few pieces of tortoise.

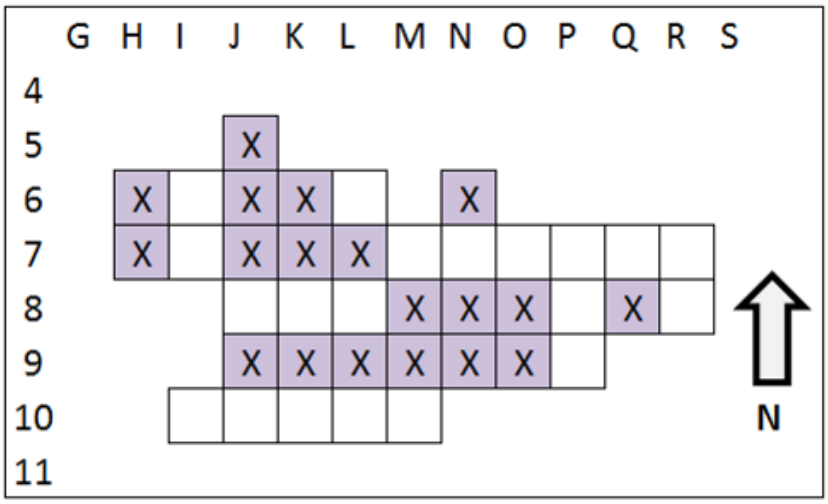


Figure 63: *Distribution of bone fragments (X) at KGP2014/013.*

6.7. KGP2014/016

This site has a slightly different context to all the other sites in that it was marginally elevated from the old drainage line through being located on a gentle slope facing towards the northwest. The area is sandy and bushy (Figures 5 & 64) and the vegetation made excavation difficult. It was necessary to excavate in the spaces between the bushes with the result that excavation of a large, contiguous area was not possible. However, 42 m^2 was excavated in a swathe running across the slope. Due to the layout of the bushes, it was not possible to create an east-west baseline so in this instance the grid is oriented southeast-northwest.

Figure 64: *View of the surface of KGP2014/016 showing one of the larger sandy patches left of the bushes in the foreground.*

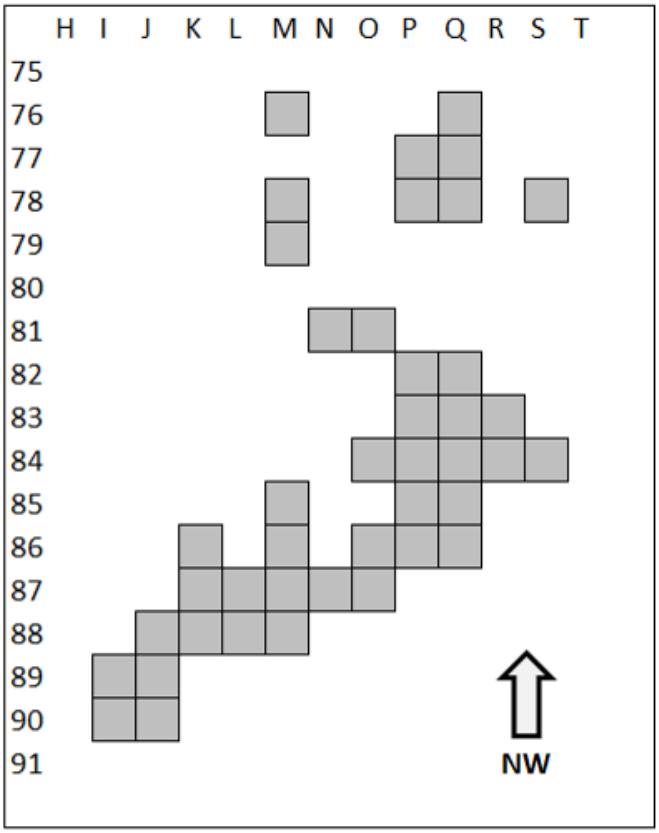


Figure 65: *Map of the excavated area at KGP2014/016. All squares are 1 m^2.*

6.7.1. Stone artefacts

This site produced a flaked stone artefact assemblage of 246 artefacts that was again slightly different to the other sites excavated as part of this mitigation project in that it was the only one to contain segments (crescent-shaped backed tools; Figure 66). The segments may indicate that this site is older than the rest. Both of them have edge damage on their sharp margins indicating their use for some or other task. A few interesting combination artefacts were found on this site. They include a hammer stone that was also used as an irregular core, perhaps after it broke (Figure 67); an irregular core that appears to have also been used as a chopper because one edge is battered in such a way as to have not yielded any useable flakes; and a single platform core that has been used as a hammer stone and likely also as a chopper (Figure 68). Another possible chopper is the radial core whose flaked edge does not extend the full perimeter of the artefact, as is usually the case, and which is battered in such a way as to suggest use as a chopper.

***Table 6**: Typological analysis of flaked stone artefacts from KGP2014/016.*

Age	**LSA occupation**				**Background scatter**			
Stone material	**Qtz**	**Qz**	**CCS**	**Oth**	**Qtz**	**Qz**	**CCS**	**Oth**
Single platform core	1	1						
Single platform core/large chopper		1						
Single platform bladelet core			1					
Radial core		1						
Irregular core	2	4						
Backed point	1							
Segment	2							
Sidescraper			1					
Endscraper			1					
Retouched flake							1	
Edge-damage flake	1	1	1				2	
Edge-damage chunk							1	
Blade		2	1					
Bladelet	5	1	3					
Flake	77	44	25			2	2	
Chunk	8	3	3			2		
Chip	51	2	2		1	1		
Total per stone material	**148**	**60**	**38**		**1**	**5**	**6**	
% of stone material	**60.2**	**24.4**	**15.5**		**8.3**	**41.7**	**50.0**	

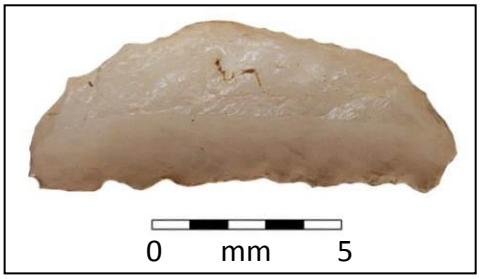


***Figure 66:** A quartz segment from KGP2014/016. The backed edge is at the top and the small notches along the lower edge are a result of use of the artefact.*

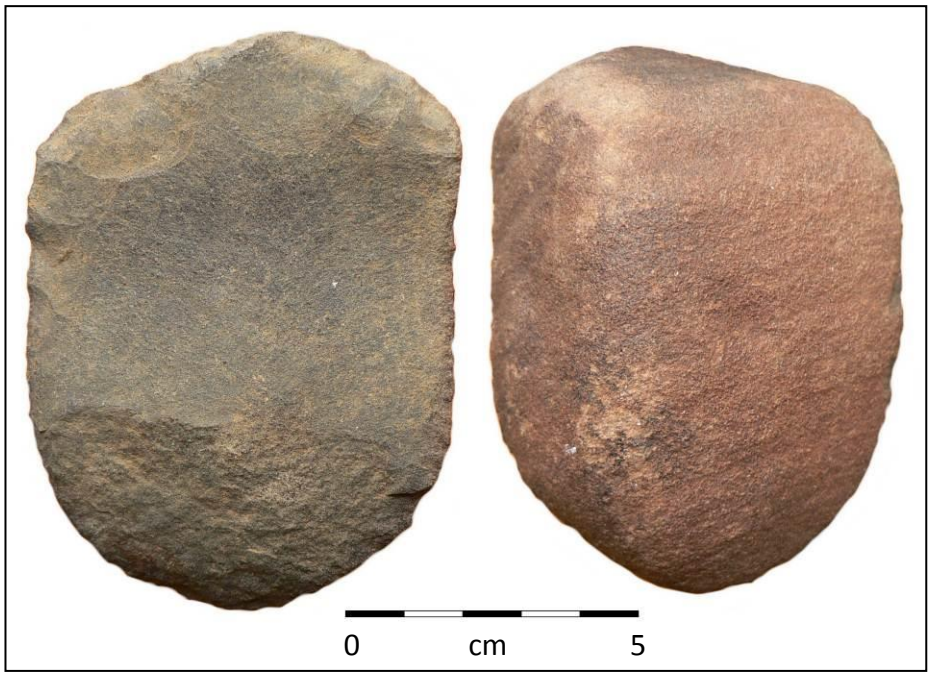


Figure 67: *A cobble that was used as both a hammer stone and an irregular core. Hammering damage is visible on the cortical surface, while flaking took place on the opposite surface.*

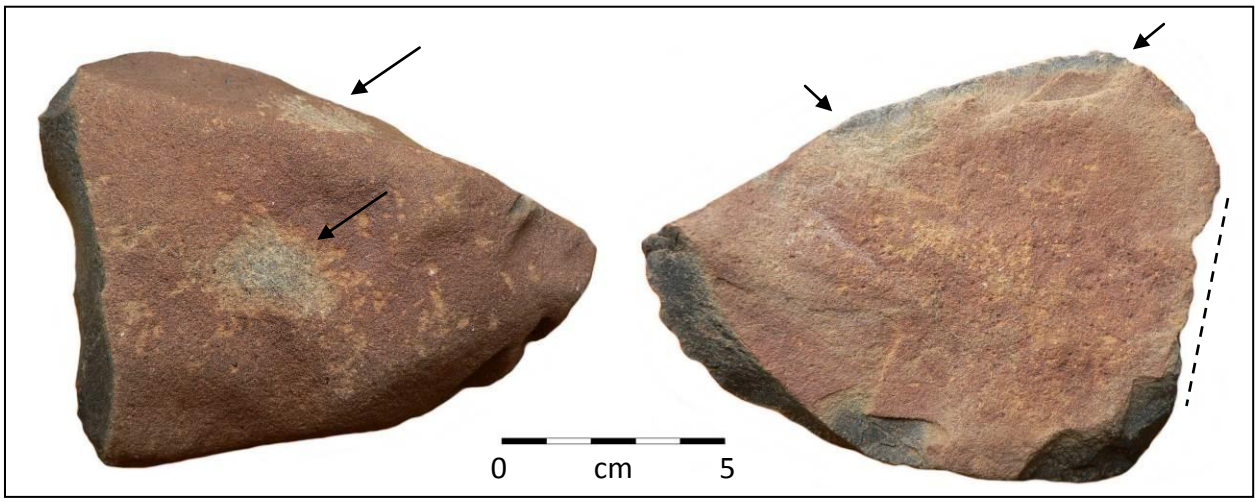


Figure 68: *A single platform core (with the platform indicated by the dashed line), that has also been used as a chopper (battered edge between the two short arrows) and a hammer stone (hammered areas indicated by the two longer arrows).*

The densest accumulation of artefacts was in the north-eastern part of the site (Figure 69). Although retouched tools are spread across the site, the majority were also found in this same area along with the choppers.

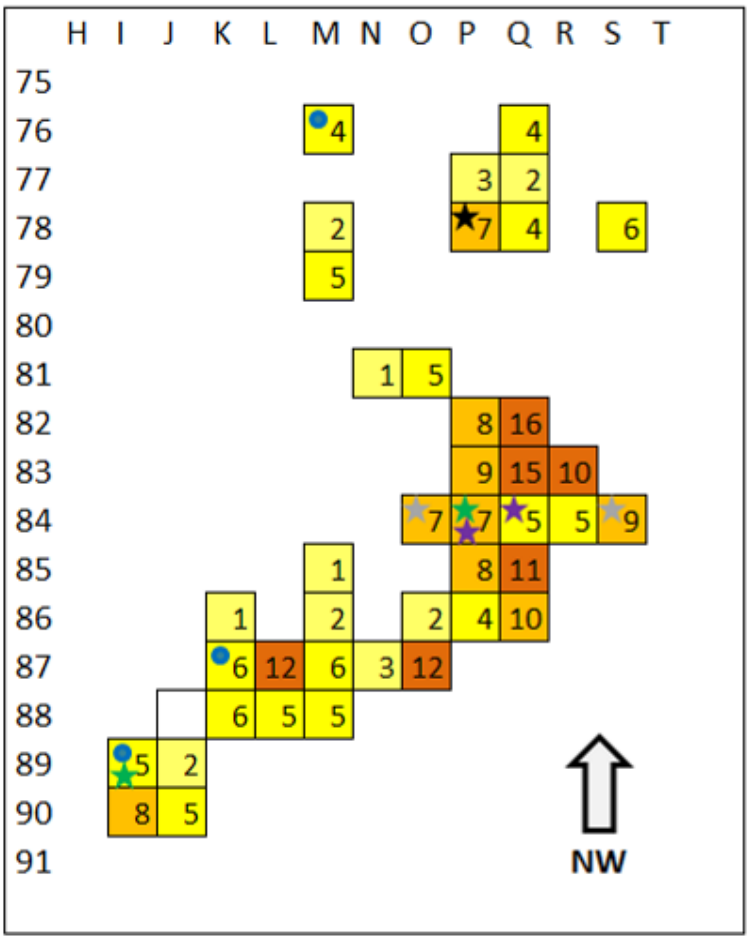


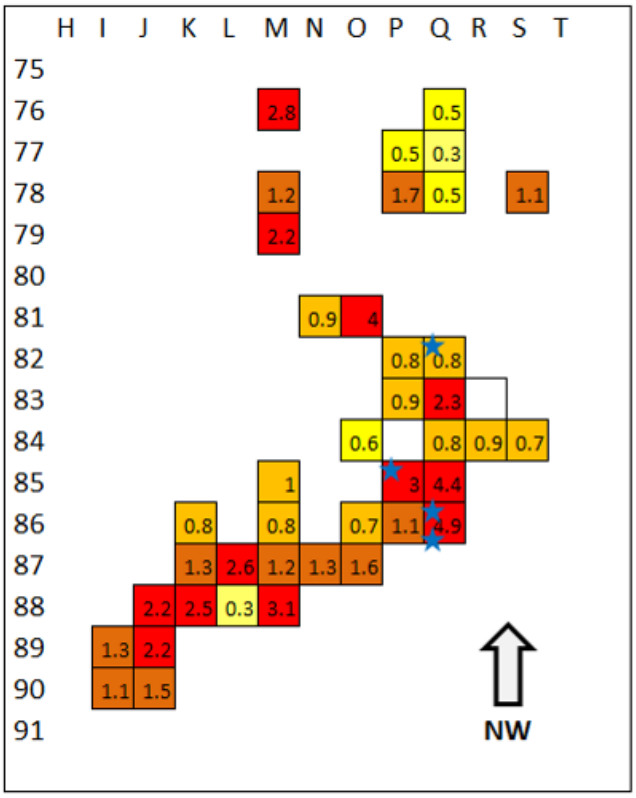
Figure 69: *Density distribution of all stone artefacts at KGP2014/016. The green stars denote quartz segments, the black star a quartz backed point, the purple stars denote CCS scrapers, the grey stars are the quartzite choppers, and the blue circles are the hammer stones.*

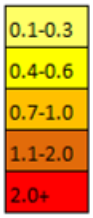
6.7.2. Ostrich eggshell

The excavation yielded 212 ostrich eggshell fragments weight a total of 62.4 g. They were spread quite evenly across the site (Figure 70). There were four engraved fragment, two of which had single lines crossing them. The third had two parallel lines, while the last had parallel lines with diagonals in between (Figure 71). Two burnt fragments of ostrich eggshell were found in one square (N87).

6.7.3. Animal bone

Fragments of animal bone were lightly dispersed across the site (Figure 72). Tortoise was the only animal identifiable.





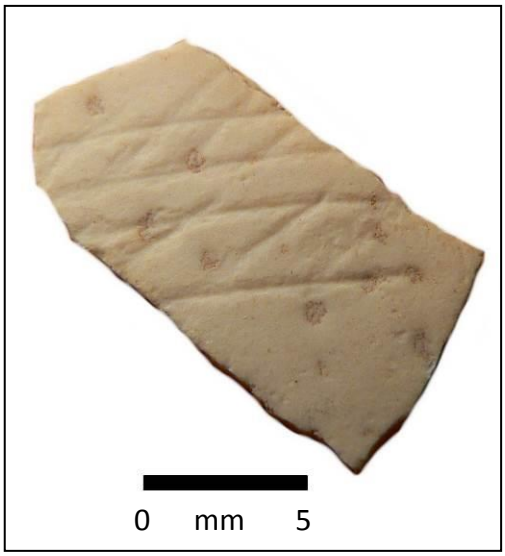


Figure 70: *Density distribution of ostrich eggshell fragments by weight (g) at KGP2014/016. The blue stars indicate the locations of engraved pieces.*

Figure 71: *One of the engraved fragments of ostrich eggshell from KGP2014/016.*

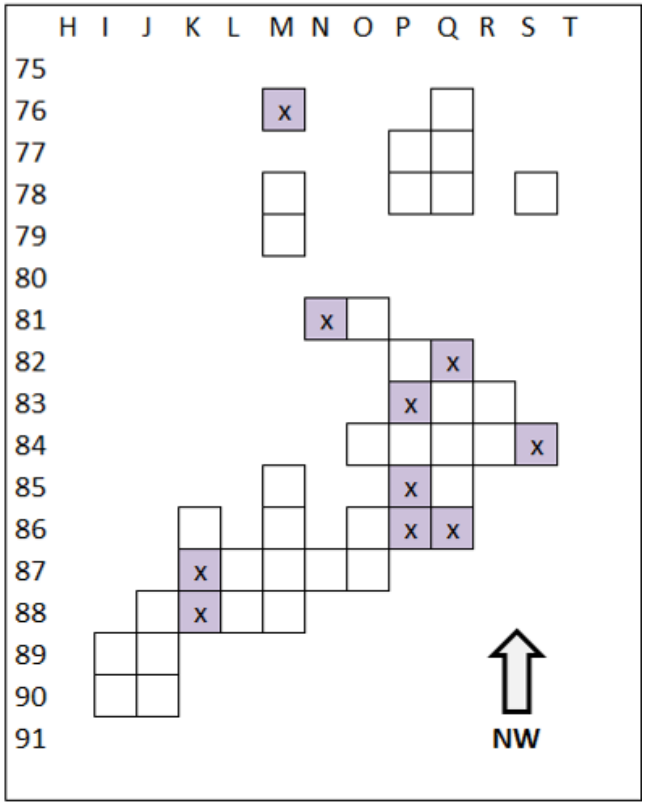


Figure 72: *Distribution of bone fragments (X) at KGP2014/016.*

7. DISCUSSION

A number of aspects of the excavations and resulting findings merit some further discussion.

Regarding methodology, consideration was given as to whether the use of different sized sieves made any material difference on assemblage character. Plotting the ratio of flakes to chips amongst the quartz artefacts revealed that the first four sites, despite the use of a smaller mesh size on one of them, had almost identical ratios (Figure 73). These four sites had visually and typologically similar characters. The last two sites, however, had somewhat different characteristics and these also showed markedly different ratios of flakes to chips. The frequency of cores also did not relate well to either flakes or chips (the ratios were highly variable). It is concluded that the manner in which the assemblages were created by the inhabitants of the sites had a far stronger bearing on these ratios than mesh size did.

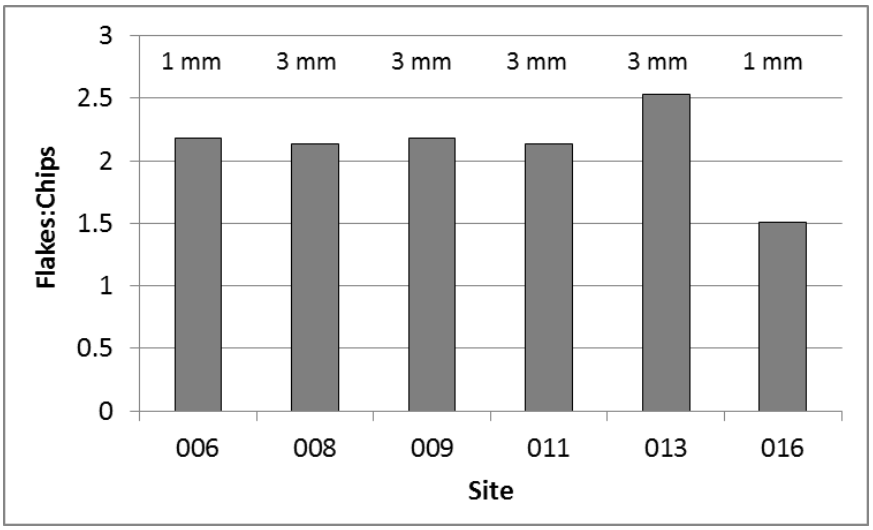


Figure 73: *Graph showing the ratio of flakes to chips for the six excavated sites.*

It has been noted that there is a 'background scatter' across much of Bushmanland. The excavations described here have captured very small samples of this scatter. Quartzite appears to have been the most favoured material prior to the more recent LSA occupations, with CCS second. The great variability in weathering amongst these artefacts shows that they relate to a relatively great period of time, and, although most artefacts probably relate to the MSA, there are likely some that originated in the ESA as is demonstrated by the hand-axes that have previously been found on the farm.

It was clear that at KGP2013/008 the occupants had been quite happy to collect and reuse older artefacts that they found on the landscape. This is a sensible strategy since the rocks have already been 'tested' for quality. At other sites, though, this was less frequently practised (KGP2014/006 & 013) or, in the case of the remaining three (KGP2014/009, 011 & 016) there was no sign of any reuse whatsoever. It is interesting that in other areas adzes have been documented as having been made on older MSA flakes or blades, for example at Renbaan Cave in the Olifants River valley (Kaplan 1987) and at KK002 in southern Namaqualand (Orton 2012). This practice was also in evidence here, but only on three of the six adzes (a fourth was made on a fresh flake that had been struck from an older artefact).

The diversity in the retouched components of the excavated assemblages is of interest (Table 7). From the work of others we expect the most frequent retouched tools in this area to be backed bladelets. The backed bladelets and points may have been used for arrow tips or set into handles to be used as knives – in the latter case several might have been placed end-to-end. Segments have also been suggested for these sorts of uses. KGP2014/006, 009 and 011 certainly fit the pattern of high backed bladelet frequencies (Figure 74). The presence of more adzes in general than might have been expected from Parsons' (2007) data is perhaps surprising, and indicates diversity in the assemblages from the region. Adzes are generally considered to be wood-working tools, and the examples found here may have been used in the maintenance of implements such as digging sticks which might have been made from sticks sourced at the Orange River.

Table 7: *Frequencies of retouched stone tool types excluding fragments from the Klipgats Pan sites and others in the region. *Data taken from Parsons (2007: table 3) with % blades calculated by the present author. Ascription to the Swartkop (SK) and Doornfontein (DF) industries is also indicated following Parsons (2007). **Includes one 'double segment'.*

	Backed bladelets & points	Segments	Backed piece fragments	Scrapers	Scraper fragments	Adzes	% retouched artefacts	% blades of flakes & blades
KGP2014/006	12		4			1	1.90	9.65
KGP2014/008	1			1		2	2.82	5.56
KGP2014/009	2					1	2.21	3.61
KGP2014/011	3		2	1	1	1	3.14	8.28
KGP2014/013			2	4			2.54	4.33
KGP2014/016	1	2		2			2.03	7.45
JP7* (SK)	14	3**	24	34		8	4	13.39
MB1* (DF)	5	2	4	10			2	1.68
BVM3* (DF)	1		1	2			0.5	9.77
BP2* (DF)	3		9	6			2	8.75
VMG* (SK)	4		4	1			1	6.93

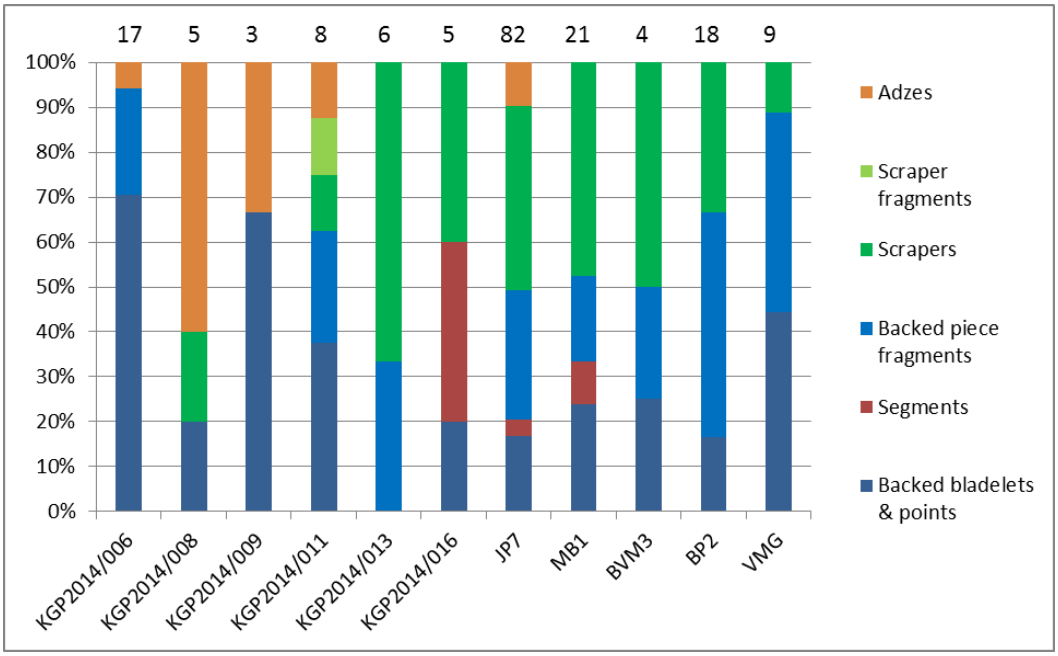


Figure 74: *Graph based on the data in Table 7. The numbers along the upper margin indicate the number of tools in the sample.*

It has been suggested that higher frequencies of retouched artefacts occur in hunter-gatherer sites than in herder sites (Smith *et al.* 1991). It is generally considered that 'high' means at least 2 %, while the low frequencies expected in herder sites would be less than about 1 %. The retouched tool frequencies in the Klipgats Pan samples are all quite high. KGP2014/006, the site with the lowest retouch frequency is, however, the one that is most likely to belong to the Doornfontein Industry (based on high frequencies of backed tools – see Table 8), but it has a relatively low diversity of tool types because it lacks scrapers. The other five sites all have lower frequencies of backed tools which, following Parsons (2007), suggests an ascription to the Swartkop Industry. The presence of blades and bladelets may also help to distinguish the two industries, although later Swartkop sites may have fewer blades present (Table 8). Among the Klipgats Pan sites, KGP2014/006 has the highest blade frequency which would contradict its possible ascription to the Doornfontein Industry. It is certainly well higher than the blade frequency of the Vlermuisgat (VMG) assemblage assigned by Parsons (2007) to the Swartkop.

Table 8: *Characteristics of Swartkop (c.f. hunter-gatherer) and Doornfontein (c.f herder) assemblages in Bushmanland (Source: Parsons 2007:5).*

Swartkop lithics	Doornfontein lithics
1 Blades / bladelets are present in higher numbers in earlier components and in lower numbers in later components (see Beaumont et al 1995).	Blades / bladelets are present in low numbers
2 Blades / bladelets were used for hunting (Lombard & Parsons in press).	Blades / bladelets were used for hunting.
3 Irregular flakes are generally microlithic.	Irregular flakes are generally microlithic.
4 Retouched pieces include microlithic backed pieces and macrolithic scrapers.	Retouched pieces are generally microlithic.
5 Large formal components occur on earlier sites and smaller formal components on later sites.	Formal components are small, not completely absent, and often include a wide range of types.
6 Although present in considerable numbers, backed blades / bladelets represent <60 per cent of formal components. It is possible that fewer backed pieces characterise formative Swartkop assemblages.	Backed pieces occur in relatively high frequencies.

It appears that these two industries, and perhaps also the preceding Springbokoog, are not well understood. This might be because their study has been based on a very small number of assemblages. Parsons (2006:199) sees the two sets of characteristics said to describe the Swartkop and Doornfontein Industries as "a relatively flexible guideline, not as a blueprint". Furthermore, the assemblages also changed through time, while "local environmental circumstances, individual preferences and outside influences all affected the composition and characteristics of the assemblages". It is clear that, with further study, the newly excavated Klipgats Pan archaeological sites will make a valuable contribution to furthering our understanding of the late Holocene sequence in the Bushmanland region by significantly enlarging the sample of assemblages available for study. A better understanding of this region will make more fruitful any comparison with better studied regions like coastal Namaqualand (Dewar 2008; Orton 2012) and also, perhaps, enhance our understanding of the beginnings of herding in South Africa.

Coming back to the Klipgats Pan sites themselves, it is interesting to note how much more scientifically valuable these sites were after excavation and analysis, since far more items were

discovered than could ever have been found from a surface examination alone. In particular, retouched stone tools, engraved ostrich eggshell fragments, pottery and animal bones were revealed. This shows the value of sampling sites that, on initial surface examination do not appear to carry a high degree of significance. However, even sites of relatively low significance – generally very small or ephemeral sites – can be of scientific value as they may well represent the only archaeological occurrences from a particular time period or in a particular place. This point has been highlighted by Orton (2007) in reference to a series of ephemeral shell scatters which were found, on excavation, to harbour informative aspects of material culture. Placing individual sites which in and of themselves have relatively low significance into a regional context and interpreting them alongside other excavated sites also enhances their research value. It is clear that, although archaeological traces are super-abundant on the Copperton landscape, largely *in situ* archaeological sites with research value are less frequent. This increases the value of sampling such sites when they are located within development areas, as was the case here.

8. CONCLUSIONS

This mitigation project has sampled a series of six LSA sites and an *ex situ* scatter of pot sherds. The sites contained stone artefacts, plain and engraved ostrich eggshell fragments, occasional potsherds and many very small fragments of animal bone. The sites have provided a valuable comparative data set which will help further the study of late Holocene archaeology in northern Bushmanland. The material will be curated in the McGregor Museum, Kimberley, and will be available for further study by researchers.

With the excavation of these sites, the development area is now considered to be clear of significant heritage resources. This report thus fulfils the requirements of the SAHRA comment stemming from the 'walk through' phase.

9. RECOMMENDATIONS

It is recommended that SAHRA accept this report as the final heritage requirement prior to construction of the proposed Mulilo Prieska PV facility on the remainder of Portion 4 of Klipgats Pan 117. It should be noted, however, that if any further *in situ* archaeological material (including human burials) is 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 material is the property of the state and may require excavation and curation in an approved institution.

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