ARCHAEOLOGICAL IMPACT ASSESSMENT

PROPOSED ESTABLISHMENT OF MATERIAL SOURCES FOR THE UPGRADING OF THE R335 BETWEEN MOTHERWELL AND ADDO EASTERN CAPE

Prepared for:

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Executive summary

1. Introduction

ACRM was appointed by Terratest (Pty) Ltd to conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed establishment of material sources for the upgrading of the National Route R335 between Motherwell and Addo in the Eastern Cape.

Proposed road improvement works include re-alignment and widening of the existing road, drainage infrastructure upgrades, widening and/or replacement of bridges and culverts and all associated road furniture.

A Phase 1 Archaeological and Cultural Heritage Impact Assessment for the upgrading of the affected road, has already been undertaken.

The upgrade of the road will require the sourcing of material (rock & gravel) from the surrounding area, for use in construction as bedding, backfill and layer works material.

In order to supply the material required for the proposed upgrade of the R335, it is proposed to make use of two material sources, namely:

- BP2, and
- BP3

The combined extent of the two borrow pits is about 3 ha.

2. Heritage legislation

In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) is required if the footprint area of the proposed development is more than 5000m² in extent.

3. Aim of the HIA

The overall purpose of the study is to assess the sensitivity of archaeological resources in the proposed Borrow Pit sites, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

4. Results

A field assessment was undertaken on the 30th October 2018, in which the following observations were made:

4.1 BP2

Limited numbers of Middle Stone Age (MSA) resources including flakes, chunks, hammerstones and cores, were recorded during the field study, where the remains are

spread thinly and unevenly over the surrounding landscape. Most of the implements were recorded on compact brown sand below the top soils, in previously disturbed areas. No formal tools such as scrapers or points were found. A small number of implements were also found in an old borrow pit/quarry adjacent the proposed new borrow pit. However, no settlement sites or any evidence of human activity was encountered, and the majority of the tools in BP2 most likely represent discarded flakes and flake debris.

The small numbers, isolated and disturbed context in which they were found mean that the remains have been graded as having *low* (Grade IIIC) archaeological significance.

4.2 BP3

Limited numbers of stone tools (of *low*, Grade IIIC significance) were recorded across the proposed footprint area. More than 99% of the remains are assigned to the MSA, while a single Early Stone Age (ESA) biface was found. Extensive scatters of round quartzite cobbles in the western sector and across much of the northern sector of the proposed development site were clearly used as sources of raw material for making stone tools.

A relatively large number of unmodified flakes, chunks, cores and hammerstones were also recorded, *in situ*, among extensive scatters of round quartzite cobbles 60m north west of the proposed borrow pit. The remains have been graded as having *high* (Grade IIIA) archaeological significance, and the `site' has been designated as a `No-Go' area.

5. Anticipated impacts

5.1 BP2

Quarrying activities may impact on dispersed scatters of Middle Stone Age resources below the top soils, but the impact significance is rated as being low.

5.2 BP3

Quarrying activities will impact on surface scatters of Middle Stone Age remains, but the impact significance is rated as being low.

6. Conclusion

The main layer of the cultural landscape consists of stone tools assigned to MSA. However, most of the remains are spread thinly and unevenly over the surrounding landscape. No evidence of settlement sites, or human occupation was found and indications are that most of the tools represent discarded flakes and flake debris.

Extensive scatters of round quartzite cobbles in BP3 were clearly used as a source of raw material by MSA people, for procuring and making stone tools. One such scatter, graded as having *high* (Grade IIIA) local significance, was recorded outside the footprint area of the proposed development site.

Overall, the impact significance of the proposed development on important archaeological heritage is assessed as LOW, and therefore there are no objections to the development proceeding.

7. Recommendations

7.1 BP2

1. No archaeological mitigation is required prior to proposed activities commencing.

7.2 BP3

1. No archaeological mitigation is required prior to proposed, activities commencing.

2. A 50m buffer must be established around Points 667-716. This area must be demarcated a `No Go Area' due to the presence of sensitive archaeological deposits.

3. The above recommendations must be included in the Environmental Management Plan (EMP) for the proposed development.

Table of Contents

1. INTRODUCTION

ACRM was appointed by Terratest (Pty) Ltd to conduct a Phase 1 Archaeological Heritage Impact Assessment for the proposed establishment of material sources (i. e. borrow pits) for the proposed upgrading of the National Route R335 between Motherwell and Addo in the Eastern Cape (Figures 1 -3).

Proposed road improvement works include re-alignment and widening of the existing road, drainage infrastructure upgrades, widening and/or replacement of bridges and culverts and all associated road furniture.

A Phase 1 Archaeological and Cultural Heritage Impact Assessment for the upgrading of the affected road, has already been undertaken (Van Ryneveld 2016).

The upgrade of the road will require the sourcing of material (rock & gravel) from the surrounding area, for use in construction as bedding, backfill and layer works material.

In order to supply the material required for the proposed upgrade of the R335, it is proposed to make use of two material sources, namely:

- BP2, and
- BP3

The combined extent of the two borrow pits is about 3ha.

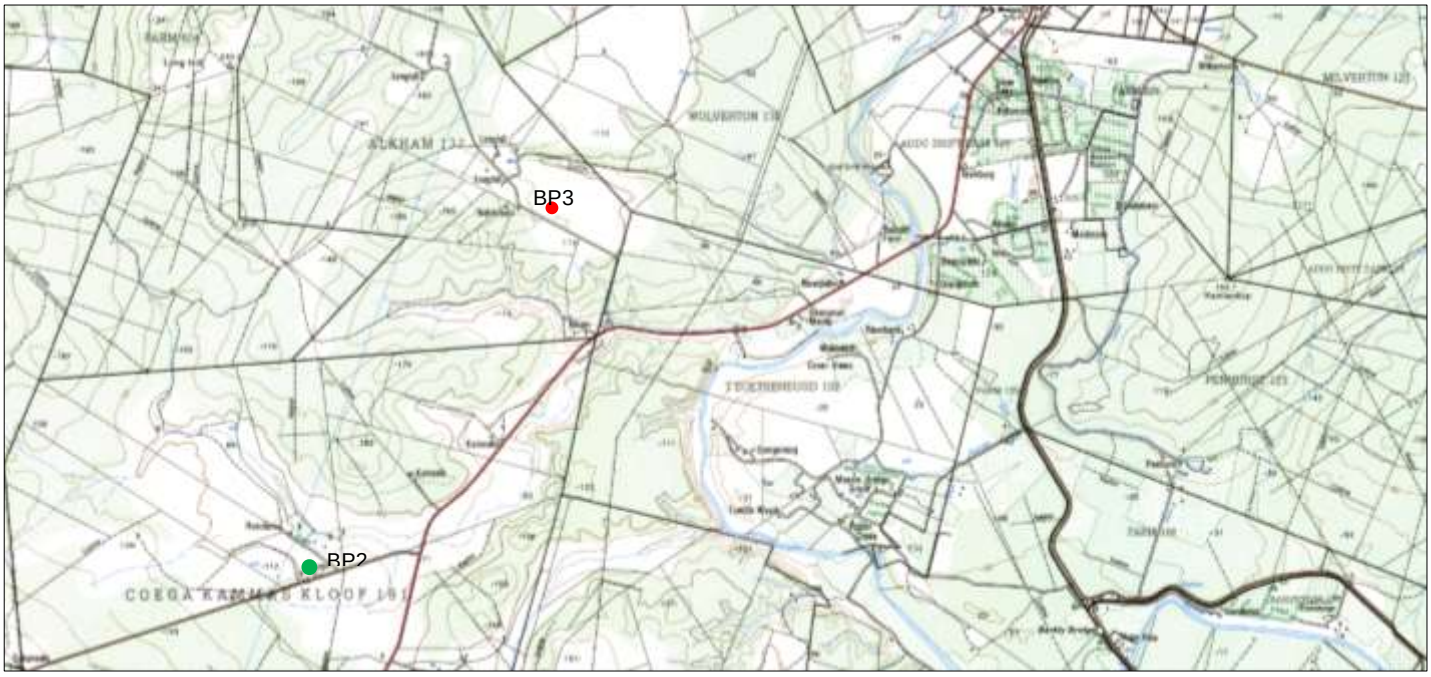

Figure 1. Locality map (3325DA Addo) indicating the location of BP2 (green polygon) & BP3 (red polygon)

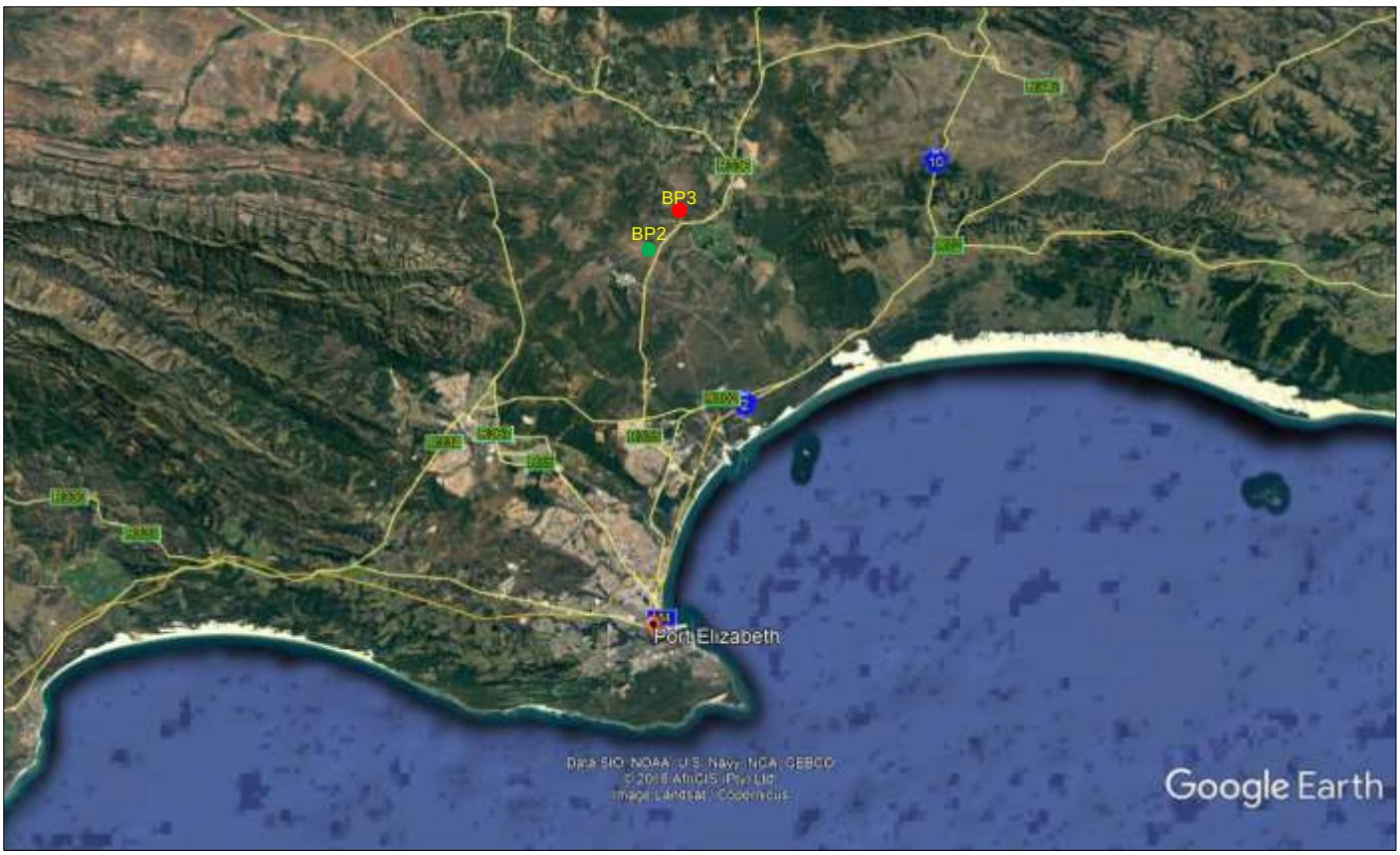

Figure 2. Google satellite map indicating the location site of BP2 (green polygon) and BP3 (red polygon)

Figure 3. Close up Google satellite map indicating the location of BP2 and BP3 (blue polygons)

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at a provincial level.

According to the Act (Sect. 35), it is an offence to destroy, damage, excavate, alter or remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit issued by the SAHRA or applicable Provincial Heritage Resources Agency, *viz*. Eastern Cape Provincial Heritage Authority (ECPHA).

Notification of ECPHA is therefore required for proposed developments exceeding certain dimensions (Sect. 38), upon which they will decide whether or not the development must be assessed for heritage impacts (an HIA) that may include an assessment of archaeological impacts (a AIA).

3. TERMS OF REFERENCE

The terms of reference for the study were to:

- Determine whether there are likely to be any important archaeological resources that may be impacted by the proposed development;

- Indicate any constraints that would need to be taken into account in considering the development proposal;

- Identify possible `No-Go` areas, and

- Recommend mitigation action

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

4.1 BP2

BP2 is located on Portion 2 (remaining extent) and Portion 4 of the Farm Coega Kammas Kloof No. 191, situated approximately 1km west of the R335 (Figure 4). The proposed development site is accessible off the P1958, which connects to the R335. The site is fairly level, sloping gently from north to south and covered in short grass, succulent ground cover, and sporadic bush in the north western portion, which is more densely vegetated. The site is bound by gravel farm roads in the west, south and east. Several barely visible two-track roads and old animal tracks cross the site. Burrowing is also present. Some disturbance of the top soils has taken place, while the northern portion is fairly severely degraded. There are no significant landscape features on the proposed development site. Surrounding land use is game farming (Charihandra Lodge), while an old borrow pit/quarry is located directly adjacent the proposed new borrow pit (Figures 5-10).

Figure 4. Proposed Borrow Pit 2 (blue polygon)

Figure 5. BP2. View facing north west

Figure 6. BP2. View facing west

Figure 7. BP2. View facing south

Figure 8. BP2. View facing south east

Figure 9. BP2. View facing north

Figure 10. BP2. Old quarry/borrow pit. View facing north west.

4.2 BP3

BP3 is located on Portion 1 (remaining extent) of the Farm Alkham No. 132, situated approximately 1.3kms north-west of the R335 (Figure 11). The borrow pit is accessible off an existing gravel road, which connects to the R335. The proposed site is located on the northern edge of an old quarry/borrow pit. The site is fairly level and covered in dense, natural veld on a substrate of compact grey and red sands, and extensive scatters of round naturally occurring quartzite cobbles, particularly across the western and northern portions of the site. The eastern sector is covered in short grasses, with patches of dense thicket occurring in places, while the western sector and most of the northern sector is covered in extremely dense, sometimes impenetrable thicket vegetation. A gravel/calcrete two-track farm road cuts through the middle of the proposed site, while numerous animal tracks crisscross the property. A small dry pan occurs on the northern boundary of the site. There are no significant landscape features on the proposed site, and no visible springs or streams, but a large pan/wetland area is located near the western boundary of the site. Surrounding land use is game farming (Long Hill Game Reserve). Apart from the gravel farm road, the proposed site is relatively undisturbed (Figures 12-17).

Figure 11. Proposed Borrow Pit 3

Figure 12. BP3. View facing north west

Figure 13. BP3. View facing north west

Figure 14. BP3. View facing north

Figure 15. BP3. View facing north west

Figure 16. BP3. View facing north

Figure 17. BP3. View facing north

5. STUDY APPROACH

5.1 Method

The purpose of the study is to assess the sensitivity of archaeological resources in the study area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

A field assessment was undertaken by ACRM on 01 November, 2018.

The position of identified archaeological resources, were plotted using a hand held GPS unit set on the map datum wgs 84. A track path of the survey was also captured.

A literature survey was carried out to assess the heritage context surrounding the proposed development site.

5.2 Constraints and limitations

There were no constraints or limitations associated with the study. Archaeological visibility was overall good, and mobility across the two proposed borrow pits was also good. Dense thicket vegetation in the north western portion of BP3, however, resulted at times in poor archaeological visibility.

5.3 Identification of potential risks

Based on the results of the study, there are no archaeological risks associated with the proposed establishment of BP2 and BP3.

An important (Grade IIIA) stone knapping quarry site in the north western portion of BP3 falls outside the proposed footprint area, and will not be impacted by proposed quarrying activities.

5.4 Archaeological context

Dispersed (i. e. low density) scatters of Middle Stone Age (MSA) tools, of *low* (Grade IIIC) significance were recorded by Van Ryneveld (2016) during an informal assessment of the previously exploited borrow PPC Borrow Pit, and during a more detailed study of proposed Borrow Pit-01. Both sites are likely to be utilized for the upgrade of the R335 between Motherwell and Addo.

Of interest to this study is that limited numbers of MSA tools of *low* (Grade IIIC) significance were recorded on the Farm Coega Kammas Kloof 191 and surrounding farms, during a baseline study for the proposed Coega Hazardous Waste site (Kaplan 2006). Proposed BP2 is located on Farm 191.

Van Schalkwyk & Wahl (2007) also recorded dispersed Early Stone Age (ESA), MSA and Later Stone Age (LSA) occurrences along the Gamma-Grassridge power lines, just north of

the R335 from Motherwell to Addo, while Webley (2003, 2007) described ESA, MSA, and LSA occurrences from the Addo Elephant National Park, and on the banks of Sunday's River, all within a 10km radius of the study area.

Large numbers of well-preserved animal bones were recorded in calcrete deposits in the Aloes area to the east of the R335, where the variety of bones, teeth and horn-cores, as well as the presence of possible bone tools indicates that prehistoric people deposited them more than 37 000 years ago (Gess 1969).

6. FINDINGS

6.1 BP2

Limited numbers of archaeological resources were recorded in proposed BP2, on the farm Coega Kammas Kloof 191 (Figure 18).

A spreadsheet of waypoints and a description of archaeological finds are presented in Table 1.

More than 99% of the tools recorded are assigned to the MSA, while only two Later Stone Age (LSA) lithics were recorded. No LSA pottery, ostrich eggshell or any other organic remains were found. No ESA tools such as bifaces, or Large Cutting Tools (LCTs) were noted. More than 98% of the artefacts are in locally available quartzite, with the remainder in basalt, and indurated shale/lydianite. A few small unworked opaline pebbles were also found.

As expected, a small number of isolated, MSA tools were found on the excavated floor of the old quarry/borrow pit adjacent the proposed (new) borrow pit. These included a handful of modified and unmodified flakes, chunks, a broken pebble hammerstone and several small and large cores, including one in the raw material lydianite (Point 110 & Figures 19 & 20).

A thin scatter of MSA tools were also recorded below the top soils on compact brown sands (Point 310) in an erosion scar in the north western corner of the old quarry (Figure 21). The tools comprise mostly unmodified and several modified flakes, a retouched blade tool, chunks, small round cores and a hammerstone. An interesting find included a small double sided anvil/miscellaneous grindstone fragment (Figure 22).

Limited numbers of MSA tools were recorded in the footprint of BP2, and are spread very thinly and unevenly over the surrounding landscape. All of the tools were found below the top soils in disturbed areas, alongside a barely visible two-track road, animal paths, burrowing and some sheet erosion. The majority of the tools comprise modified and unmodified triangular shaped flakes, chunks, small round cores, and a few blade tools. One partially retouched pointed flake (Point 199) and a possible LSA broken bored stone (Point 309) was also found. No hammerstones, grindstones, or formal retouched tools such as points or scrapers were found (Figures 23-26).

No evidence of any human settlement or activity was noted and the tools most likely represent discarded flakes and flake debris.

The relatively small numbers and disturbed and degraded context in which they were found means that the archaeological remains have been graded as having *low* (Grade IIIC) significance.

Figure 18. Trackpaths (in red) and waypoints of archaeological finds

Point / site	Name of Farm	Lat/long	Description of finds	Grading	Mitigation
	Coega Kammas Kloof 191		All in quartzite unless otherwise stated		
110		S33° 37.028' E25° 35.561'	A few miscellaneous retouched pieces, indurated shale core, quartzite core, broken hammerstone, flakes – in old quarry / borrow pit	Low (IIIC)	None required
210		S33° 36.998' E25° 35.559'	Small collection of tools including flakes, chunks, double sided anvil/misc. grindstone fragment, hammer stone below top soils in erosion scar on edge of old borrow pit.	Low (IIIC)	None required
310		S33° 37.010' E25° 35.535'	A few dispersed MSA flakes and chunks	Low (IIIC)	None required
410		S33° 37.018' E25° 35.540'	Same as above	Low (IIIC)	None required
059		S33° 37.034' E25° 35.534'	A few MSA flakes and chunks alongside deep scar on edge of old quarry	Low (IIIC)	None required
069		S33° 37.042' E25° 35.528'	Core and flake in small path / animal track	Low (IIIC)	None required
079		S33° 37.074' E25° 35.525'	MSA flakes, chunk, large indurated shale flake on edge of borrow pit	Low (IIIC)	None required
089		S33° 37.074' E25° 35.510'	A few MSA tools, chunk and core in gravel road on eastern boundary of new quarry site	Low (IIIC)	None required
099		S33° 37.098' E25° 35.510'	MSA flakes, inc. lydianite flake & large core on patch of ground below top soils	Low (IIIC)	None required
109		S33° 37.076' E25° 35.503'	Dispersed scatter of MSA flake tools alongside gravel road	Low (IIIC)	None required
119		S33° 37.051' E25° 35.494'	Same as above	Low	None

				(IIIC)	required
129		S33° 36.990' E25° 35.471'	MSA flakes, chunks, rusted metal, glass on eroded lands in northern portion, outside footprint area	Low (IIIC)	None required
139		S33° 36.993' E25° 35.464'	Several flakes & chunks, glass, rusted metal – same as above	Low (IIIC)	None required
141		S33° 37.013' E25° 35.472'	Round core	Low (IIIC)	None required
159		S33° 37.075' E25° 35.482'	MSA core, flakes on eroded patch of ground alongside old animal track	Low (IIIC)	None required
169		S33° 37.053' E25° 35.482'	Chunk / core	Low (IIIC)	None required
179		S33° 36.981' E25° 35.454'	A few tools in degraded path	Low (IIIC)	None required
181		S33° 37.000' E25° 35.460'	MSA core, flake, chunk, small pebble chunk below top soils	Low (IIIC)	None required
199		S33° 37.048' E25° 35.474'	Pointed MSA flake	Low (IIIC)	None required
209		S33° 37.072' E25° 35.480'	MSA flakes, core on disturbed patch of land alongside animal track	Low (IIIC)	None required
219		S33° 37.110' E25° 35.492'	MSA chunks, flake, core below top soils on patch of soil alongside animal track	Low (IIIC)	None required
229		S33° 37.075' E25° 35.468'	MSA flake on patch of ground alongside animal track	Low (IIIC)	None required
239		S33° 37.051' E25° 35.461'	Same as above	Low (IIIC)	None required
249		S33° 36.995' E25° 35.449'	Same as above, including large chunk, flake, rusted metal, glass	Low (IIIC)	None required
259		S33° 37.055' E25° 35.447'	Chunk, core & flake	Low (IIIC)	None required
269		S33° 37.096' E25° 35.454'	Same as above	Low (IIIC)	None required
279		S33° 37.112' E25° 35.461'	Same as above, including large chunks of sort limestone	Low (IIIC)	None required
289		S33° 37.127' E25° 35.465'	Weathered indurated shale core	Low (IIIC)	None required
299		S33° 37.070' E25° 35.434'	Possible LSA indurated shale flake, chunk, core alongside animal track	Low (IIIC)	None required
309		S33° 37.045' E25° 35.441'	Possible broken bored stone	Low (IIIC)	None required
319		S33° 37.069' E25° 35.432'	Indurated shale cortex flake, MSA flake, chunk	Low (IIIC)	None required
328		S33° 37.105' E25° 35.424'	Thin scatter of MSA flakes, chunks, 2 cores below top soils, on larger eroded patch of ground alongside old two track road	Low (IIIC)	None required
338		S33° 37.115' E25° 35.427'	Weathered, prepared core (MSA)	Low (IIIC)	None required
348		S33° 37.092' E25° 35.408'	Small, MSA flake	Low (IIIC)	None required
358		S33° 37.135' E25° 35.401'	MSA flake, core in small animal track	Low (IIIC)	None required
368		S33° 37.116' E25° 35.502'	Chunk, core in small animal track	Low (IIIC)	None required
378		S33° 37.107' E25° 35.524'	Large MSA flake alongside edge of gravel road	Low (IIIC)	None required

Table 1. Spreadsheet of waypoints and description of archaeological finds

Figure 19. Tools found in old borrow pit/quarry. Scale in cm

Figure 20. Tools found in old borrow pit/quarry. Scale in cm

Figure 21. Site 210. Context in which the remains were found. View facing north east

Figure 22. Tools from Site 210. Scale is in cm

Figure 23. Collection of tools. Scale is in cm

Figure 24. Point 159. Context in which the remains were found. View facing south.

Figure 25. Site 032. Context in which the remains were found

Figure 26. Tools from Site 032. Scale is in cm

6.2 BP3

Limited numbers of archaeological resources were recorded in BP3, on Farm 132/1 (Figure 27). Extensive surface scatters of round quartzite cobbles across much of the site, however, were clearly used as sources of raw material by MSA hunter-gatherers, for making stone implements. Flake debris including chunks, flaked chunks and round cores, are associated with most of these cobble surface deposits, but overall, the numbers are very small (i. e. low density scatters), and the remains have been graded as having *low* (Grade IIIC) significance (Table 2). All the tools recorded are in quartzite. No formal tools such as points or scrapers were found (Figures 28-31). No LSA pottery or ostrich eggshell was encountered, but one ESA biface (Point 807) was found.

Relatively large numbers of flakes, chunks, flaked, chunks and round cores, were recorded among an extensive surface scatter of round quartzite cobbles about 60m north west of the proposed footprint area of BP3 (Figures 32-35). Concentrated around Points 667-716, the visibly higher concentration of flake debris, including the several round cobble hammerstones, indicate higher levels of raw material procurement and flaking/knapping activity. No formally retouched tools such as points or scrapers were found, suggesting that such implements were most likely removed from the quarry/procurement site, to a home base further away. The location of a large pan/wetland area close to the site, where in the past, animals would have come to drink, may have been a target area for MSA people. This area, contained in the yellow polygon in Figure 27, is clearly a MSA quarry/stone knapping site in primary context, and has been graded as having *high* (Grade IIIA) local significance.

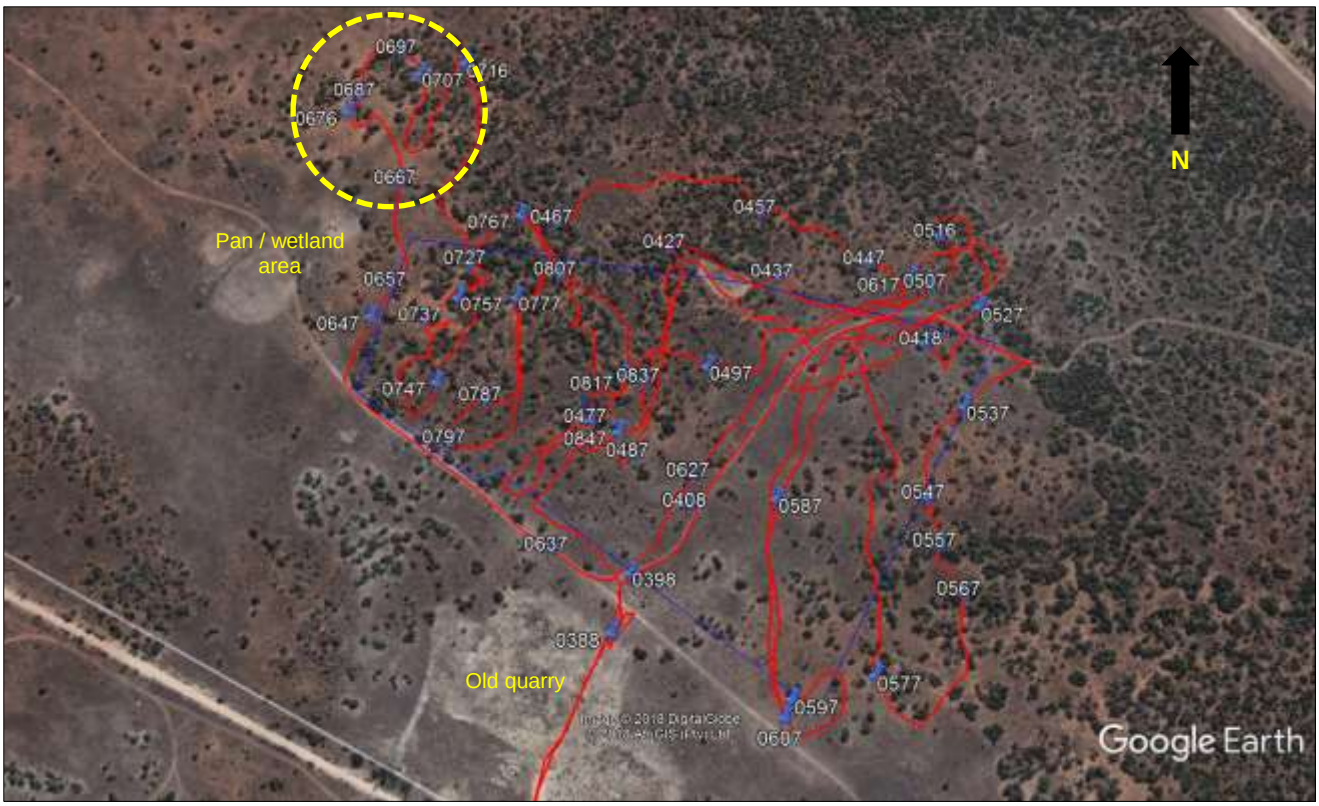

Figure 27. BP3. Trackpaths (in red) and waypoints of archaeological finds. Yellow polygon indicates sensitive archaeological deposits

Point	Name of Farm	Lat/long	Description of finds	Grading	Mitigation
	Ptn 1 (remaining extent) of Farm Alkham No. 132		All in quartzite unless otherwise stated		
0388		S33° 34.706' E25° 37.642'	MSA flake embedded in road on edge of quarry	Low (IIIC)	None required
0398		S33° 34.684' E25° 37.650'	MSA tools in gravel road	Low (IIIC)	None required
408		S33° 34.659' E25° 37.676'	A few MSA flakes & chunks on stony substrate	Low (IIIC)	None required
418		S33° 34.598' E25° 37.784'	2 cores, MSA flakes, chunks, on pebble/cobble substrate	Low (IIIC)	None required
427		S33° 34.560' E25° 37.667'	Several MSA flakes, blade tool and chunks on pebble & cobble substrate	Low (IIIC)	None required
437		S33° 34.571' E25° 37.717'	A few MSA flakes and chunks on patch of cobbles surrounded by dense thicket	Low (IIIC)	None required
447		S33° 34.566' E25° 37.759'	Several MSA flakes in footpath	Low (IIIC)	None required
457		S33° 34.546' E25° 37.709'	Several flakes, chunks, core on cobble substrate surrounded by dense thicket	Low (IIIC)	None required
467		S33° 34.550' E25° 37.615'	Several MSA flakes, chunks, large flaked cobble/core on bed of round cobbles surrounded	Low (IIIC)	None required

			by dense thicket		
477		S33° 34.627' E25° 37.631'	Same as above	Low (IIIC)	None required
487		S33° 34.640' E25° 37.651'	Same as above	Low (IIIC)	None required
497		S33° 34.606' E25° 37.685'	Same as above	Low (IIIC)	None required
507		S33° 34.575' E25° 37.787'	Prepared core	Low (IIIC)	None required
516		S33° 34.555' E25° 37.792'	A few large MSA flakes & chunks on extensive scatter of round cobbles	Low (IIIC)	None required
527		S33° 34.583' E25° 37.810'	Same as above	Low (IIIC)	None required
537		S33° 34.622' E25° 37.801'	A few flakes and chunks on scatter of round cobbles	Low (IIIC)	None required
547		S33° 34.656' E25° 37.783'	Same as above	Low (IIIC)	None required
557		S33° 34.674' E25° 37.788'	A few isolated flakes and chunks on grey sounds	Low (IIIC)	None required
567		S33° 34.691' E25° 37.798'	Same as above	Low (IIIC)	None required
577		S33° 34.721' E25° 37.758'	Isolated flakes and chunks on sand and round quartzite cobbles	Low (IIIC)	None required
587		S33° 34.657' E25° 37.715'	Isolated flake	Low (IIIC)	None required
597		S33° 34.730' E25° 37.721'	MSA flake	Low (IIIC)	None required
607		S33° 34.736' E25° 37.718'	Flake and chunks in road	Low (IIIC)	None required
617		S33° 34.572' E25° 37.779'	Flakes and chunk on scatter of round cobbles surrounded by dense thicket	Low (IIIC)	None required
627		S33° 34.648' E25° 37.678'	MSA flake alongside road	Low (IIIC)	None required
637		S33° 34.675' E25° 37.614'	Flakes and chunks in grave/limestone road on edge of footprint	Low (IIIC)	None required
647		S33° 34.587' E25° 37.531'	Isolated MSA flakes and chunks associated with substrate scatter of round quartzite cobbles	Low (IIIC)	None required
657		S33° 34.574' E25° 37.539'	Same as above	Low (IIIC)	None required
667		S33° 34.534' E25° 37.542'	Higher density scatter of MSA flakes, chunks, cores, hammerstone on extensive beds of round quartzite cobbles. Higher incidence of flaking activity and procurement of raw materials	High (IIIA)	Outside footprint area - none required
676		S33° 34.506' E25° 37.517'	Relatively larger numbers of retouched and unmodified MSA flakes, blades and flake debris (chunks, cores, flaked chunks) on extensive scatter of round quartzite cobbles. Several hammerstones also noted. Higher incidence of flaking activity – tools/debris all appear in-situ. Clearly MSA quarry and stone knapping site	High (IIIA)	Outside footprint area – none required
687		S33° 34.499' E25° 37.521'	Same as above –	High (IIIA)	Outside footprint

			extensive scatter of flakes and flake debris, including hammerstones		area – none required
697		S33° 34.481' E25° 37.541'	Same as above – extensive scatter of flake and flake debris	High (IIIA)	Outside footprint area – none required
707		S33° 34.490' E25° 37.550'	Extensive scatter of MSA flakes, blades, chunks, cores, hammerstone on substrate of quartzite cobbles.	High (IIIA)	Outside footprint area – none required
716		S33° 34.486' E25° 37.571'	Several large MSA flakes, chunks, cores on scatter of round quartzite cobbles	High (IIIA)	Outside footprint area - none required
727		S33° 34.566' E25° 37.575'	A few flakes, and chunks on cobble substrate	Low (IIIC)	None required
737		S33° 34.588' E25° 37.555'	Dispersed scatter of a few MSA flakes, chunk, core, in open area on red sands.	Low (IIIC)	None required
747		S33° 34.613' E25° 37.562'	Several MSA flakes and chunks on red sands	Low (IIIC)	None required
757		S33° 34.580' E25° 37.571'	A few isolated MSA flakes and chunks on red sands	Low (IIIC)	None required
767		S33° 34.547' E25° 37.599'	A few MSA flakes and chunks on substrate of round cobbles surrounded by dense thicket	Low (IIIC)	None required
777		S33° 34.580' E25° 37.597'	MSA flakes, chunks, large and smaller round cores, on bed of round quartzite cobbles and red sands surrounded by dense thicket	Low (IIIC)	None required
787		S33° 34.619' E25° 37.584'	MSA flakes, core, chunk	Low (IIIC)	None required
797		S33° 34.635' E25° 37.568'	Core	Low (IIIC)	None required
807		S33° 34.570' E25° 37.617'	**ESA biface**, MSA flakes, chunks, cores on scatter of round cobbles surrounded by dense thicket	Low (IIIC)	None required
817		S33° 34.610' E25° 37.647'	MSA lithics on extensive scatter of round cobbles surrounded by dense thicket vegetation	Low (IIIC)	None required
827		S33° 34.623' E25° 37.629'	MSA flake	Low (IIIC)	None required
837		S33° 34.612' E25° 37.655'	MSA flakes, core, chunk, cortex flake on surface scatter of round quartzite cobbles	Low (IIIC)	None required
847		S33° 34.631' E25° 37.644'	MSA flakes, flaked chunk, core, chunks on substrate of round quartzite cobbles/pebbles	Low (IIIC)	None required

Table 2. Spreadsheet of waypoints and description of archaeological finds

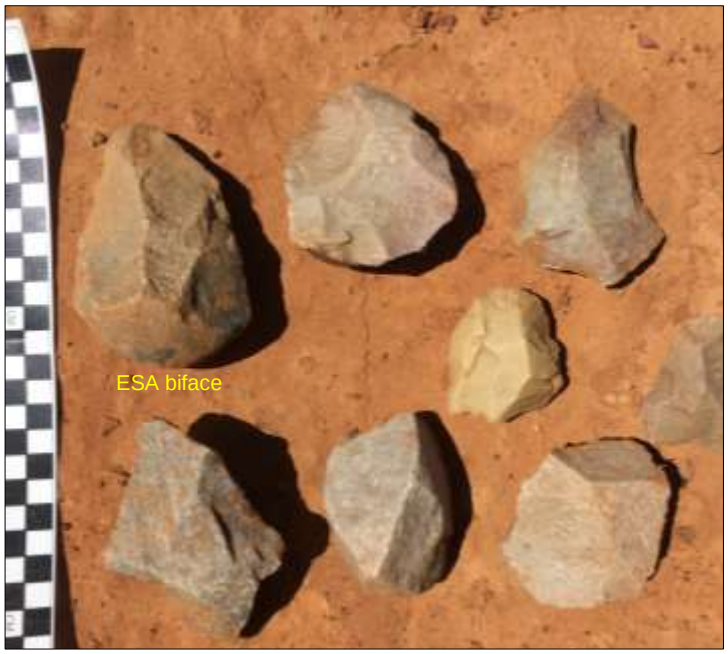

Figure 29. Collection of tools from remainder of the site
Scale is in cm

Figure 29 Collection of tools from remainder of the site. Scale is in cm

Figure 30. Collection tools form remainder of the site. Scale is in cm

Figure 31. Collection of tools from remainder of the site. Scale is in cm

Figure 32. Site 667. View facing south

Figure 33. Site 687.

Figure 34.Site 697. View facing north

Figure 35. Site 707. View facing south east

7. IMPACT ASSESSMENT

Direct impacts typically occur at the Construction Phase, and primarily comprise damage or destruction of non-renewable archaeological resources. Other direct impacts could be disturbance of sub surface deposits during the construction phase, as well as the exposure of unmarked human remains which for obvious reasons are difficult to predict.

With regard to the proposed establishment of material sources (i. e. BP2 & BP3) for the upgrading of National Route R335 between Motherwell and Addo in the Eastern Cape, direct impacts are likely to limited, however.

Tables 3 & 4 present the assessment of archaeological impacts at BP2 and BP3, during the Construction Phase.

Damage or destruction of archaeological resources in BP2		
	Without Mitigation	**Assuming Mitigation**
Extent	Localized/permanent but limited to the immediate vicinity of the site	Local
Duration	Permanent	Permanent
Intensity	Low	Low
Significance	Low	Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Reversibility	Irreversible	
Loss of resource	Low	
Mitigation potential	Low	

Table 3. BP2. Assessment of impacts during the construction phase

Damage or destruction of archaeological resources in BP3		
	Without Mitigation	**Assuming Mitigation**
Extent	Localized/permanent but limited to the immediate vicinity of the site	Local
Duration	Permanent	Permanent
Intensity	Low	Low
Significance	Low	Low
Status	Negative	Negative
Probability	Definite	Definite
Confidence	High	High
Reversibility	Irreversible	
Loss of resource	Low	
Mitigation potential	Low	

Table 3. BP3. Assessment of impacts during the construction phase

8. CONCLUSION

The study has captured a good record of the archaeological heritage present on BP2 and BP3. The main layer of the cultural landscape consists of stone tools assigned to MSA. Most of the remains are spread thinly and unevenly over the surrounding landscape. No evidence of settlement sites, or human occupation was found and indications are that most of the tools represent discarded flakes and flake debris.

Extensive scatters of round quartzite cobbles in BP3 were clearly used as a source of raw material by MSA people for procuring and making stone tools. One such scatter, graded as having *high* (Grade IIIA) local significance, was recorded outside the footprint area of the proposed development site and will not be impacted by proposed quarrying operations.

Overall, the impact significance of the proposed development on important archaeological heritage is assessed as LOW, and therefore there are no objections to the proposed development proceeding.

9. RECOMMENDATIONS

With regard to the establishment of material sources for the upgrade of the R355 between Motherwell and Addo, the following recommendations are made.

9.1 BP2

1. No archaeological mitigation is required prior to proposed, quarrying activities commencing.

9.2 BP3

1. No archaeological mitigation is required prior to proposed, quarrying activities commencing.

2. A buffer of 50m must be established around Points 667-716. This area must be established as a `No Go Area' due to the presence of sensitive archaeological deposits.

3. The above recommendations must be included in the Environmental Management Plan (EMP) for the proposed development.

10. REFERENCES

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