

# ARCHAEOLOGICAL IMPACT ASSESSMENT THE PROPOSED PORT NOLLOTH WASTE SITE NORTHERN CAPE

Prepared for:

**Bvi Consulting Engineers**

Att: Mr Winston Cloete

P O Box 683

Springbok

8240

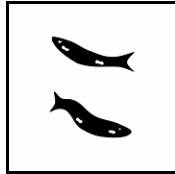
Tel: 027 712 9990/7

Email: [Winston@bvinam.co.za](mailto:Winston@bvinam.co.za)

On behalf of:

**Richtersveld Municipality**

By



Jonathan Kaplan

**Agency for Cultural Resource Management**

5 Stuart Road

Rondebosch

7306

Ph/Fax: 021 685 7589

Cellular: 082 321 0172

Email: [acrm@wcaces.co.za](mailto:acrm@wcaces.co.za)

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## Executive summary

The Agency for Cultural Resource Management (ACRM) was commissioned by Bvi Consulting Engineers to conduct an Archaeological Impact Assessment (AIA) for the proposed construction and operation of a waste refuse facility in Port Nolloth in the Northern Cape.

The 26 ha site is located on the right hand side of the road about 3 kms before the entrance to the coastal town. A large portion of the site is currently the existing Port Nolloth waste site, and the footprint area will be enlarged to accommodate the anticipated increased volumes of the town's domestic waste over the coming years.

The proposed site is a windswept, barren, piece of land that is literally covered in thousands of plastic bags and other domestic debris that has been scattered about by the swirling winds, and dumped over the site. Numerous gravel roads, tracks, and footpaths cover the terrain, which is also visited by people from local settlements salvaging 'waste' to be either re-used or sold. The receiving environment constitutes a severely degraded and transformed landscape.

ACRM has been instructed to undertake a baseline study in order to locate and map archaeological sites or remains that may potentially be impacted by the proposed development, to assess the significance of the potential impacts and to propose measures to mitigate any impacts.

The AIA forms part of the Environmental Basic Assessment process that is being undertaken by independent environmental consultants, Enviro-Logic cc.

A field study took place in August, 2011, in which the following observations were made:

- Archaeological remains were documented during the baseline study, despite the severely degraded and transformed nature of the receiving environment.
- The remains comprise mostly dispersed scatters of weathered shellfish, and lithics (flakes and chunks) dominated by the raw material quartz, with small numbers of quartzite and silcrete implements also present. Some ostrich eggshell was counted, but no beads, formal tools, or pottery was found. The shellfish remains are dominated by the limpets Scutellastra argenvillei, and Cymbula granatina, with Black Mussel (Choromytilus meridionalis), occurring in small numbers on some of the sites. The sites are assigned to the Later Stone Age (LSA). The absence of pottery suggests that the sites all pre-date 2000 years BP.
- Most of the archaeological remains occur in a severely degraded and disturbed context, but (surprisingly) some in-situ patches of relatively well preserved shellfish, lithics, bone, and ostrich eggshell, were documented in the footprint area. These include the two most important occurrences known as Sites 054 and 055.
- The majority of the archaeological sites, however, occur outside the footprint area of the proposed waste site and will not be impacted by the proposed project. It is important to note that security fencing will be installed around the perimeter of the proposed facility.

- The southern portion of the proposed waste site appears devoid of archaeological remains, probably due to its transformed and highly degraded state.

Sites 054 and 055 have been rated as having medium-low & medium significance respectively, and will likely be destroyed by the proposed development of the waste refuse facility. Both sites comprise relatively well preserved in-situ shell midden deposits, lithics, bone and ostrich eggshell. These sites will therefore require mitigation (i.e. sampling and dating) prior to implementation of the proposed project.

The remaining sites that occur inside the footprint area (i.e. Sites 051, 052, 056, 057, 059 & 066) will also be destroyed by the proposed activities, but these comprise mostly dispersed scatters of weathered shellfish, small numbers of stone tools and some OES. In addition, all these sites occur in a severely disturbed and degraded context, and have been rated as having low significance. Excavation or sampling of these sites will provide little contextual information.

The majority of the archaeological sites documented during the baseline study will, however, not be impacted by the proposed development as they occur outside the footprint area of the proposed waste site. Sites 074 & 075 have been rated as having medium-low and medium-high significance respectively, as they occur in an undisturbed context and contain relatively large volumes of in-situ shell deposits, as well as stone tools, OES and bone. The remaining sites (i.e. Sites 053, 058, 059, 060-065 & 073) all occur in a degraded and disturbed context and have been rated as having low significance.

With regard to the proposed construction and operation of a waste refuse facility at Port Nolloth, the following recommendations are made:

1. Sampling and dating of the sites called 054 & 055 must take place before proposed construction activities commence. It is recommended that that an area of about 3-4 m<sup>2</sup> from each site will be sufficient to obtain a representative sample of shell for dating and analysis. In addition, all cultural remains (stone artefacts and ostrich eggshell) on the surface must be collected for analysis. Surface sands should also be sieved and material collected. Sites 054 and 055 have the potential to provide important information on the settlement of Namaqualand before 2000 years ago.
2. Should any unmarked human remains, or buried ostrich eggshell ostrich caches be exposed or uncovered during excavations these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Mariagrazia Galimberti 021 4624502).

Burials must not be removed until inspected by the archaeologist and will have to be removed by a professional archaeologist under a permit issued by SAHRA.

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## **1. INTRODUCTION**

### **1.1 Background and brief**

Bvi Consulting Engineers, on behalf of the Richtersveld Municipality, commissioned the Agency for Cultural Resource Management (ACRM) to conduct an Archaeological Impact Assessment (AIA) for the proposed construction and operation of a waste refuse facility in Port Nolloth in the Richtersveld region of the Northern Cape Province (Figure 1).

The proposed project entails the following:

- Construction of a waste refuse facility
- Installation of security fencing around the perimeter of the facility

The proposed waste site is to be located on Remainder of Erf 516 Port Nolloth.

The footprint area for the proposed waste site is about 26 ha. However, a large portion of the site is currently the existing Port Nolloth waste site, and the footprint area will be enlarged in order to accommodate the anticipated increased volumes of the town's domestic waste over the coming years.

Trenches (4m - 5m wide and 2m - 3m deep) will be excavated in which general waste will be disposed. After a trench has reached its capacity it will be closed off by covering it with a final layer of soil and a new trench will be opened up.

Existing access roads will not be upgraded as part of the project, but will be maintained by the local authority.

ACRM has been instructed to undertake a baseline study in order to locate and map archaeological sites or remains that may potentially be impacted by the proposed development, to assess the significance of the potential impacts and to propose measures to mitigate any impacts.

The AIA forms part of the Environmental Basic Assessment process that is being undertaken by independent environmental consultants, Enviro-Logic cc.

## **2. LEGAL FRAMEWORK**

The National Heritage Resources Act (No. 29 of 1999) requires that "...any development or other activity which will change the character of a site exceeding 5000 m<sup>2</sup>, or the rezoning or change of land use of a site exceeding 10 000 m<sup>2</sup>, requires an archaeological impact assessment.

## Archaeological study proposed Port Nolloth Waste Refuse Site



Figure 1. Locality map

### 3. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

- Determine whether there are likely to be any archaeological resources that may be impacted by the proposed development of the waste refuse site;
- To identify and map archaeological resources that may be impacted by the proposed development;
- To assess the sensitivity and conservation significance of archaeological resources affected by the proposed development;
- To assess the significance of any impacts resulting from the proposed development, and
- To identify measures to protect and maintain any valuable archaeological sites that may be impacted by the proposed development

#### 4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The existing Port Nolloth waste refuse site is located about 3 kms outside town on the right hand side of the road (R382). The proposed site is a fairly surreal, barren and featureless landscape, comprising a series of low undulating, wind swept, and sparsely vegetated sand dunes that are literally covered in thousands of plastic bags, and domestic and construction debris that has been scattered about by the swirling winds, and dumped over a very wide area. Several large artificial dunes tower over the existing dump and the proposed new facility (Figures 2-9). Numerous gravel roads, tracks and footpaths intersect the property and the surrounding landscape. Some deep prospecting trenches also occur on the proposed site. The proposed site is highly degraded and constitutes a severely transformed landscape.

Apart from a few modern structures that are related to the maintenance of the existing facility, there are no old buildings on the proposed site. Surrounding land use is vast tracts of low, undulating, mobile dunes, and some activities related to diamond mining in the north east. There are no visible graves or stone cairns within the existing facility.

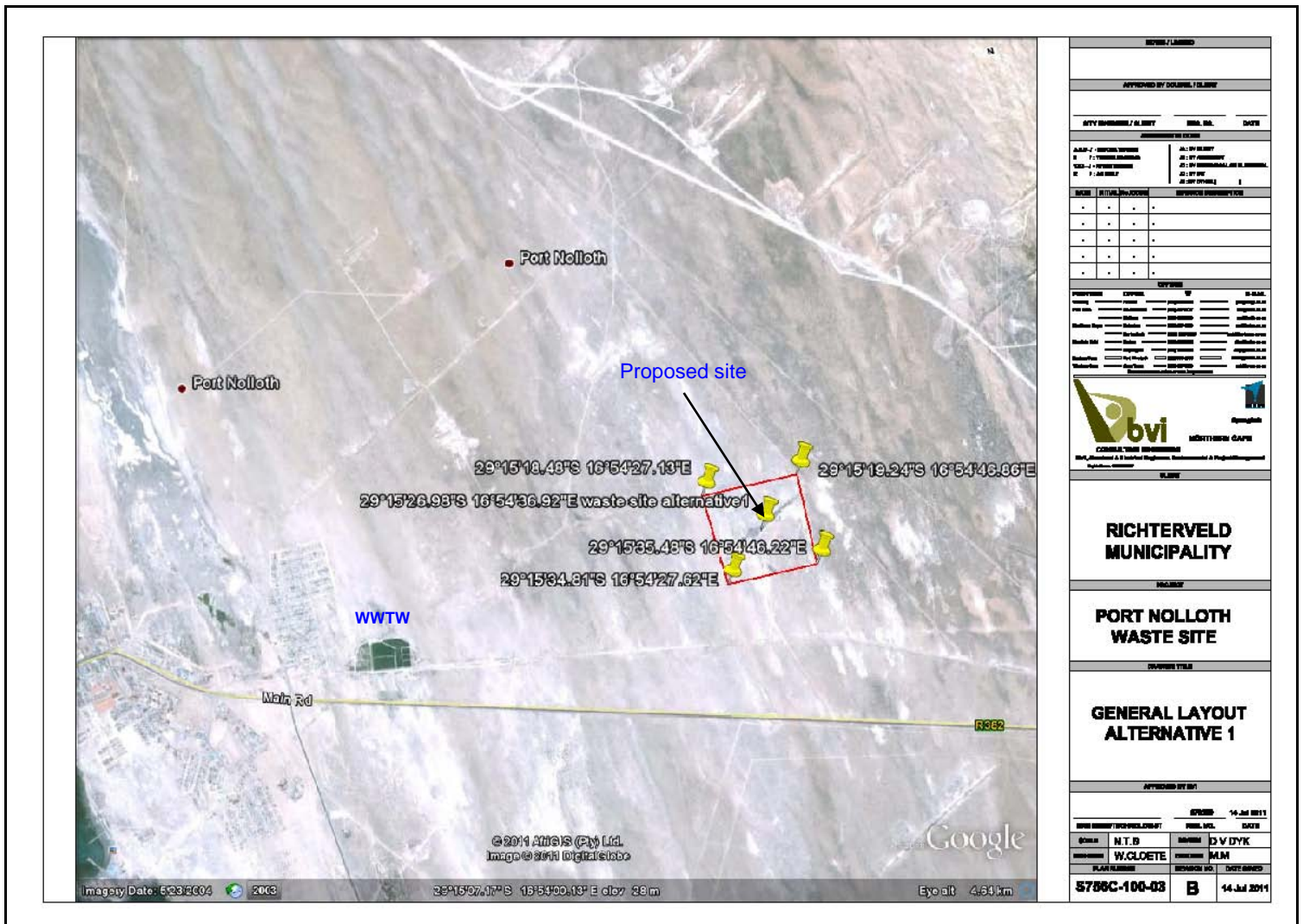


Figure 2. Proposed layout of the Port Nolloth Waste Site.

Archaeological study proposed Port Nolloth Waste Refuse Site



Figure 3. View of the existing Port Nolloth waste site facing south west.



Figure 4. View of the existing Port Nolloth waste site facing west. Photograph taken from one of several large artificial 'dunes' on the property



Archaeological study proposed Port Nolloth Waste Refuse Site



Figure 5. View of the proposed waste site facing north west. Photograph taken from one of the large sand `dunes`



Figure 6. View of the proposed waste site facing north west

Archaeological study proposed Port Nolloth Waste Refuse Site



Figure 7. View of the proposed new waste site facing south west. Note the large sand `dunes' in the background of the plate



Figure 8. View of the proposed new waste site facing south east. The road to the left of the plate more or less defines the eastern boundary of the proposed site



Figure 9. View of the proposed new waste site facing north west.

## **5. STUDY APPROACH**

### **5.1 Method of survey**

A survey of the proposed waste site was undertaken by J Kaplan on the 01<sup>st</sup> August, 2011 and a number of archaeological observations were made. Most of the study focused on the area to the north of the existing facility, as the receiving environment in the south is severely degraded, making up the bulk of the current waste site.

All archaeological remains documented during the study have been mapped using a Garmin Oregon 300 GPS unit set on the map datum WGS 84.

A Google Earth aerial photograph indicating the archaeological occurrences documented during the study is illustrated in Figure 26 in the Appendix.

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

A desk top study was also undertaken.

### **5.2 Constraints and limitations**

There were no constraints or limitations associated with the study and archaeological visibility was very good.

### 5.3 Identification of potential risks

The following potential risks have been identified:

- Despite the severely degraded nature of the receiving environment, archaeological remains were documented during the survey, which will be impacted by the proposed activity.
- Unmarked pre-colonial human remains and ostrich eggshell caches may also be uncovered or exposed during excavations for waste trenches.

### 5.4 Results of the desk top study

More than 40 years ago J. Rudner (1968) reported that there were extensive shell middens on the coast near North Point in Port Nolloth, and that some of these middens contained engraved ostrich eggshell. Rudner (1968) also reported that in 1913 Laidler collected material from shell middens north and south of the coastal town where he commented that the deposits were “hundreds of feet in length and breadth...” and contained ostrich eggshell plaques and pendants, plain and ornamental eggshell water bottles, and pottery. According to Colson (1905) a complete pot was also found in a midden in 1899 south of the Port Nolloth jetty. This pot was half-filled with specularite (an iron powder used as decoration), as well as a bone awl and some ostrich eggshell beads.

Further south at McDougall’s Bay there are shell middens capping the dunes along the northern half of the bay (Wadley 2009), and Rudner (1968) reports on at least 52 clay pots from this area as well.

A housing development in McDougall’s Bay (named KaiKai) also resulted in disturbance to numerous middens overlooking the Bay. According to Wadley (2009) these sites have been recorded as part of an AIA by David Morris of the McGregor Museum.

In a research project undertaken on behalf of the Department of Environmental Affairs and Tourism, Kaplan (1993) listed 297 known shell midden for Port Nolloth, mostly occurring at North Point, Wedge Point and Twee Pad.

An AIA of the proposed Port Nolloth Mari Culture Park just inland of North Point was undertaken by David Morris of the McGregor Museum in 2006, where several middens were also documented. More middens were documented during a recent study for a proposed desalination plant in the Park (Kaplan 2011a). Kaplan (2011a) has also shown how unrehabilitated diamond diggings, access roads, 4 x 4 vehicles and recreational quad bikes have damaged and destroyed many middens in the dune and beach area alongside the Port Nolloth Abalone Farm.

Wadley (2009) also documented several important shell middens and scatters of stone tools and ostrich eggshell on the edge of the large salt pan to the north of the town, about 1 km inland from the coast.

Kaplan (2011b) also recently documented several scatters of well preserved shellfish, and stone tools, including ostrich eggshell, grindstones and grindstone fragments, near the town’s Waste Water Treatment Works, about 2 km inland from the coast..

Early and Middle Stone Age quarry (stone knapping) sites were recorded by Küsel (2009), during an AIA for a proposed wind farm about 15 kms east of Port Nolloth.

The Archaeology Contracts Office (ACO) at the University of Cape Town has been involved in archaeological mitigation work in the diamond fields of the Namaqualand coast since 1991. They have conducted extensive surveys of the land owned by De Beers resulting in a database of nearly 1 400 sites and undertaken extensive mitigation of shell middens. Dewar (2007) later compiled a regional synthesis of the archaeology of the Namaqualand coast based on the excavations of nine of these sites.

From the above it is clear that while archaeologists are becoming increasingly aware of the richness and importance of the Port Nolloth area, no professional archaeological research has yet been undertaken there. Sadly, it is in places like Port Nolloth, which are far from established universities and research institutions such as the McGregor Museum in Kimberly, that there is very little oversight with regard to the protection of these valuable heritage resources.

## 5. RESULTS OF THE SURVEY

### Site 051 (S29 15.355 E16 54.676)

Highly dispersed fragments of very weathered shellfish (adiagnostic limpet), a low density scatter of quartz chips, chunks and flakes, a single quartzite core and several pieces of weathered ostrich eggshell (OES) and weathered, adiaagnostic bone were recorded on a wind swept mound of compact sand and calcrete nodules surrounded by large volumes of domestic waste and debris (Figures 10 & 11). No formal tools, beads, or any other organic remains such as pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.



Figure 10. Site 051. View facing south. Note the large artificial dune in the background



Figure 11. Collection of stone tools from Site 051. Scale is in cm

**Site 052** (S29 15.351 E16 54.710)

Several quartz flakes and chunks and three pieces of weathered OES were found on barren wind swept sands north east of Site 051. No subsistence shellfish, formal stone tools, or any other organic remains such as bone or pottery were found.

The archaeological remains have been rated as having low significance.

**Site 053** (S29 15.314 E16 54.674)

A low density scatter of quartz and quartzite stone flakes, chunks and chips, and dispersed and weathered fragments of shellfish (mainly adiaagnostic limpet), including a few large whole limpets (*S. argenvillei*), a few pieces of weathered adiaagnostic bone and sand blasted OES, were documented on the wind swept and exposed surface of compact sands and calcrete nodules outside the proposed footprint area (Figures 12 & 13). No formal tools, ostrich eggshell beads, or any pottery was found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.



Figure 12. Site 053. View facing south. Note the large artificial dunes in the background of the plate



Figure 13. Collection of tools from Site 053. Scale is in cm

**Site 054** (S29 15.319 E16 54.647)

Site 054 comprises a thin patch ( $\pm 3 \times 5$  m in extent) of in-situ shellfish a few meters outside the northern boundary of the proposed footprint area (Figure 14). Most of the shell includes fragmented and weathered adiaagnostic limpets, but some larger whole shell (*S. argenvillei* and *C. granatina*) was also documented. One small quartzite hammerstone, several quartz flakes and chunks, and three pieces of weathered OES were found. No formal tools, pottery or any other organic remains such as bone or beads were found.

Given the relatively undisturbed context in which the remains were found, Site 054 has been rated as having medium-low significance.

**Site 055** (S29 15.315 E16 54.658)

The site comprises a fairly substantial patch of in situ shellfish about 4 x 5 m in extent situated on the side of a small, wind swept dune about 20 m west of Site 054 (Figure 15). The remains also occur just outside the northern boundary of the proposed footprint area. At least twelve quartz flakes and chunks, two silcrete flakes, one utilized silcrete flake, and 14 pieces of weathered OES were counted in a 1 x 1 m<sup>2</sup> indicating a relatively high density of cultural remains on the site. The shellfish is dominated by the limpets (C. granatina and S. argenvillei) with some larger fragments of Black Mussel (Choromytilus meridionalis) occurring as well. A few pieces of weathered tortoise bone also found. A smaller patch of shell dominated by C. granatina, and a few quartzite stone flakes and some OES was also found about 15 m to the south of Site 055. No pottery was found on the site suggesting that both Sites 054 and 055 pre-date 2000 years BP.

Given the relatively undisturbed context in which the remains were found, Site 055 has been rated as having medium significance.



Figure 14. Site 054. View facing north



Figure 15. Site 055. View facing north

**Site 056** (S29 15.332 E16 54.649)

Site 056 comprises a very small, thin patch of shellfish, dominated by the limpet (C. granatina) and some Black Mussel, on wind swept sands on the northern boundary of the proposed footprint area. A few quartz chunks, and chips, two quartzite flakes and a few pieces of weathered and sand blasted OES were also counted. Some dispersed shellfish fragments were also noted lying about the wind swept sands. No formal tools, beads or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 057** (S29 15.336 E16 54.626)

A very thin, dispersed scatter of quartzite and quartz chunks and flakes, and one silcrete flake was documented in a large, wind deflated patch of compact sand on the northern boundary of the proposed footprint area (Figure 16). Relatively large numbers of OES,

and many hundreds of fresh water land snail (Acatina), and some dispersed and fragmented and weathered shellfish (adiagnostic limpet) were located on the site. No formal tools or pottery were found. Many pieces of glass, rusted metal, hard and soft plastic and debris litter the surrounding area.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 058** (S29 15.315 E16 54.555)

Dispersed and very fragmented, weathered shellfish (adiagnostic limpet), and some quartz lithics including a few flakes, chunks and one small round core, and two silcrete flakes were documented in a deflated patch of sand alongside a small track outside the proposed footprint area (Figure 17). No formal tools, OES or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance



Figure 16. Site 057. View facing south west



Figure 17. Site 058. View facing south west

**Site 059** (S29 15.349 E16 54.512)

A few quartz chunks and flakes, dispersed fragments of very weathered adiaagnostic limpet, and a few pieces of weathered OES, occur in a large degraded path in the north western corner of the proposed footprint area. Several smaller tracks converge here, in an area that is littered with plastic and other domestic debris. No formal tools, pottery, or beads were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 060** (S29 15.467 E16 54.409)

Tiny fragments of adiaagnostic limpet shell, a few quartz flakes and chunks, one quartz core, two silcrete flakes, and several fragments of weathered OES, occur on compact sands in a wide eroded path in a basin on the edge of a series of low, partially vegetated



dunes, outside the footprint area of the proposed site. No formal tools, beads or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 061** (S29 15.429 E16 54.350)

Weathered shellfish fragments (S. argenvillei and adiaagnostic limpets), a few quartz flakes and chunks, two quartzite chunks, one quartzite flake, one irregular quartzite core, and one small lump of silcrete were located alongside a very degraded dune hummock and 2-track access road outside the footprint area of the proposed waste site. Large amounts of plastic and glass and other debris is lying about. No formal tools, OES, or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 062** (S29 15.379 E16 54.305)

A few dispersed stone flakes and chunks in quartz and quartzite were documented in a small wind deflated path outside the footprint area of the proposed site. No formal tools, OES, or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 063** (S29 15.286 E16 54.395)

Several quartz flakes and chips and a few quartzite flakes were documented alongside a degraded path near a deflated dune hummock outside the footprint area of the proposed waste site, Many fresh water land snail (Acatina) occur in the surrounding area. No formal tools, OES, or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.

**Site 064** (S29 15.271 E16 54.372)

A low density scatter of quartz and quartzite flakes, two small round quartz cores, some very weathered fragments of adiaagnostic (limpet) shell, and a few small pieces of weathered OES were found in a small path and in a wide deflated area about 50 m from a wide gravel road outside the proposed footprint area (Figures 18 & 19). Large numbers of freshwater Acatina (land snail) and small nodules of calcrete occur in the surrounding area. No formal tools, beads, or pottery were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance.



Figure 18. Site 064. View facing south



Figure 19. Collection of tools from Site 064. Scale is in cm

**Site 065** (S29 15.386 E16 54.476)

A very thin scatter of shellfish, mainly C. granatina and some Black Mussel occurs on soft sands outside the western boundary of the proposed footprint area. No bone, stone or any other cultural remains (OES, bead, or pottery) were found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance

**Site 066** (S29 15.421 E16 54.509)

A few fragments of weathered shellfish (adiagnostic limpet), several quartz, silcrete and quartzite flakes and chips, one MSA silcrete flake, and some weathered bone and OES were documented in a degraded path and large wind eroded basin alongside the large (artificial) 'dunes' on the western boundary of the proposed footprint area (Figures 20 & 21). The site and the surrounding area is very degraded and littered with debris such as plastic and glass. No formal tools or pottery were found.

The archaeological remains occur in a severely disturbed context and have been rated as having low significance.



Figure 20. Site 066. View facing south west



Figure 21. Tools from Site 066. Scale is in cm

**Site 073** (S29 15.254 E16 54.676)

Tiny, weathered fragments of adiagnostic shellfish (probably limpets) and some large, whole shell including S. argenvillei & C. granatina occur on compacted sands alongside a wind swept eroded dune covered in small nodules of calcrete, outside the footprint area of the proposed waste site (Figures 22 & 23). A low density scatter of stone artefacts, including a few quartz and quartzite flakes and chunks, one round quartz core, two silcrete flakes, and a few pieces of weathered OES and adiagnostic bone were found on the 'site'. A broken base of a 19<sup>th</sup> Century case bottle was also found. No formal tools, beads, or pottery was found.

The archaeological remains occur in a severely disturbed and degraded context and have been rated as having low significance

**Site 074** (S29 15.272 E16 54.662)

A thin scatter of weathered and fragmented adiagnostic shell (probably limpets) and some large whole shell (S. argenvillei, & C. granatina) were documented on soft sands against a wind eroded dune hummock about 20 m south west of Site 073 (Figure 24). The site, which is covered in the remains of fresh water land snail (Acatina), also occurs outside the footprint area of the proposed waste site. A low density scatter of lithics, including quartz flakes and chunks, one large utilized quartz flake, two quartzite flakes and one banded ironstone flake were also counted. Some weathered bird bone, and adiagnostic bone were also identified.

Another, smaller patch of undisturbed shellfish was located about 15 m to the south of Site 074, that comprises a few quartz flakes and chunks, one utilized silcrete flake/bladelet and a few pieces of weathered OES.

No formal tools, ostrich eggshell beads, or pottery were found on the site which is relatively well-preserved.

The archaeological remains have been rated as having medium-low significance.

**Site 075** (S29 15.267 E16 54.652)

Given their proximity to each other, Site 075 is probably an extension of Site 074. The occurrence comprises a low mound ( $\pm 2.5 \times 6$  m in extent) of in-situ shellfish situated on compact sands surrounded by low, vegetated, dune hummocks outside the footprint area of the proposed waste site. The relatively high volume of well preserved shellfish is dominated by the limpets (S. argenvillei & C. granatina), as well as fragments and larger pieces of Black Mussel and some C. miniata. Stone artefacts were also found and include a low density scatter of quartz flakes, chips, and chunks, one large irregular quartz core, one banded ironstone flake, one silcrete flake, one large quartzite flake, two smaller quartzite flakes, and a few round quartzite manuports. Relatively large numbers of OES were also found scattered about, but no formal tools, ostrich eggshell beads or pottery was found.

The archaeological remains occur in an undisturbed context and have been rated as having medium-high significance.



Figure 22. Site 073. View facing south.



Figure 23. Collection of tools from Site 073. Scale is in cm



Figure 24. Site 074. View facing south

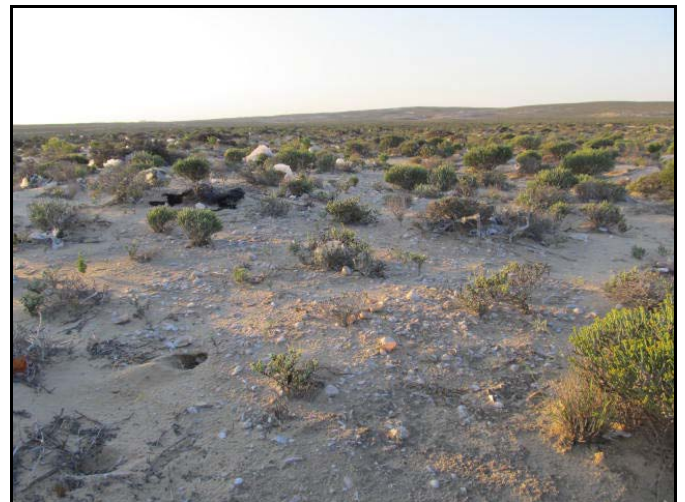


Figure 25. Site 075. View facing north

## 6. DISCUSSION

The majority of the archaeological sites documented during the baseline study comprise ephemeral scatters of marine shellfish dominated by weathered, fragmented and occasionally large whole limpets (*C. granatina* & *S. argenvillei*). Some Black Mussel (*Choromytilus meridionalis*) was also recorded, but only on four sites (055, 056, 065 & 075), and in much smaller volumes. All the archaeological occurrences are assigned to the Later Stone Age (LSA). Stone artefact frequencies on all of the sites are very low and are dominated by quartz flakes and chunks, and a few small, round and irregular cores. Quartzite and silcrete flakes and chunks were also counted, but in even smaller frequencies. Two quartzite cores ((Site 051 & 061) and one quartzite hammerstone (Site 054) was also found. No formal tools such as backed flakes, or scrapers were found on any of the sites, and only one silcrete MSA flake was found on Site 066. Weathered fragments of ostrich eggshell (OES) were documented on most of the sites, including relatively large numbers on Site 057, but no OES beads were found. No pottery was found on any of the sites, inferring that the archaeological occurrences on the proposed

waste site all pre-date 2000 years BP. The broken base of a 19<sup>th</sup> case bottle was found on Site 073, but this may have been introduced onto the site at a much later stage.

Due to the highly transformed nature of the receiving environment, most of the remains (apart from Sites 054 & 055) in the proposed footprint area, occur in a severely degraded and disturbed context.

While much work has been done on the Namaqualand coast, where several thousand shell middens have been documented, only a few LSA sites/shell middens have been recorded further inland. Most of the sites documented near the Port Nolloth salt pan by Lita Webley (2009) comprise ephemeral scatters of shellfish and lithics, but Site 1 did contain high concentrations of Black Mussel, with localized concentrations of limpets. Large numbers of stone tools were also counted, where up to 50% of the lithics on the site comprise tools (including a thumbnail scraper and several backed flakes) dominated by fine grained silcrete, with the remainder in quartz and quartzite. While relatively large quantities of OES were also found, no beads, bone, or pottery was found, leading Webley (2009) to suggest that the salt pan sites may pre-date 2000 years BP. Sites 2, 4, 5, 6 & 7 recorded by Webley (2009) near the salt pan are similar in content to the Port Nolloth Waste Site occurrences, which also comprise dispersed scatters of shellfish dominated by limpets, and low density scatters of quartz and quartzite flakes and very little silcrete.

Kaplan (2011b) recorded open station sites including a possible LSA encampment near the Port Nolloth Waste Water Treatment Works (WWTW), about 2 km inland from the coast, and about 1.5 kms south west of the proposed Port Nolloth waste site. The large camp site comprised shellfish dominated by limpets (*S argenvillei*), and relatively large volumes of Black Mussel. Stone artefact frequencies are quite low and are dominated by quartz flakes, chunks and a few round cores, with smaller numbers of quartzite and silcrete tools. Several grindstones/fragments were also counted, but no formal tools were found, Ostrich eggshell was recorded, but no beads, or pottery was found. Kaplan (2011b) suggested that the lack of pottery indicated that the WWTW sites pre-dated 2000 years BP, but the presence of an elliptical grindstone may indicate a later Herder occupation after 2000 years ago.

Archaeological mitigation (sampling and dating) was recommended by both Kaplan (2011b) and Webley (2009) which would help clarify the context and chronology of the sites.

## **7. PREDICTED IMPACTS**

Sites 054 and 055 have been rated as having medium-low & medium significance respectively, and will likely be destroyed by the proposed development of the waste refuse facility. Both sites comprise relatively well preserved in-situ shell midden deposits, lithics, bone and ostrich eggshell. These sites will therefore require mitigation (i.e. sampling and dating) prior to implementation of the proposed project.

The remaining sites that occur inside the footprint area (i.e. Sites 051, 052, 056, 057, 059 & 066) will also be destroyed by the proposed activities, but these comprise mostly dispersed scatters of weathered shellfish, small numbers of stone tools and some OES. In addition, all these sites occur in a severely disturbed and degraded context, and have

been rated as having low significance. Excavation or sampling of these sites will provide little contextual information.

The majority of the archaeological sites documented during the baseline study will, however, not be impacted by the proposed development as they occur outside the footprint area of the proposed waste site. Sites 074 & 075 have been rated as having medium-low and medium-high significance respectively, as they occur in an undisturbed context and contain relatively large volumes of in-situ shell deposits, as well as stone tools, OES and bone. The remaining sites (i.e. Sites 053, 058, 059, 060-065 & 073) all occur in a degraded and disturbed context and have been rated as having low significance.

It is important to remember that security fencing will also be installed around the perimeter of the proposed waste facility which, theoretically, should protect sites that occur outside the proposed footprint area, but uncontrolled access of people who visit the site to salvage waste cannot be managed. Such movement of people across the landscape may impact marginally on some of the archaeological sites, but these impacts are not expected to be significant.

## **8. RECOMMENDATIONS**

With regard to the proposed construction of a waste refuse facility in Port Nolloth in the Northern Cape, the following recommendations are made:

1. Sampling and dating of the sites called 054 & 055 must take place before proposed construction activities commence. It is recommended that that an area of about 3-4 m<sup>2</sup> from each site will be sufficient to obtain a representative sample of shell for dating and analysis. In addition, all cultural remains (stone artefacts and ostrich eggshell) on the surface must be collected for analysis. Surface sands should also be sieved and material collected. Sites 054 and 055 have the potential to provide important information on the settlement of Namaqualand before 2000 years ago.
2. Should any unmarked human remains, or buried ostrich eggshell ostrich caches be exposed or uncovered during excavations these must immediately be reported to the South African Heritage Resources Agency (Ms Mariagrazia Galimberti 021 4624502). Burials must not be removed until inspected by the archaeologist and will have to be removed by an archaeologist under a permit issued by SAHRA.

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Appendix



Archaeological study proposed Port Nolloth Waste Refuse Site

| Name of site | Farm/Erf No.                       | Lat/Long              | Finds  |
|--------------|------------------------------------|-----------------------|--|
|              | Remainder Erf 516,<br>Port Nolloth |                       |  |
| 051          |                                    | S29 15.355 E16 54.676 | Fragments of very weathered shellfish (adiagnostic limpet), thin scatter of quartz chips, chunks and a few flakes, 1 quartzite core, several pieces of ostrich eggshell and adiaagnostic weathered bone on exposed wind swept mound of calcrete surrounded by rubbish and other debris.  |
| 052          |                                    | S29 15.351 E16 54.710 | A few dispersed quartz flakes and chunks. 3 pieces of ostrich eggshell   |
| 053          |                                    | S29 15.314 E16 54.674 | Low density scatter of quartz flakes, chunks and chips, a few quartzite flakes and some fragmented and weathered shellfish, including some whole limpets ( <i>S. argenvillei</i> ), weathered adiaagnostic bone and sand blasted and weathered ostrich eggshell, on a hardened wind exposed floor of compacted sands and limestone/calcrete.   |
| 054          |                                    | S29 15.319 E16 54.647 | A small patch (3 m x 5 m) of <u>in-situ</u> fragmented and weathered shellfish (limpets), including some larger whole shell ( <i>S. argenvillei</i> and <i>C. granatina</i> ). 1 small quartzite hammer stone, a few quartz flakes and chunks and 3 pieces of weathered and sand blasted ostrich eggshell.   |
| 055          |                                    | S29 15.315 E16 54.658 | A patch of (in situ) wind exposed shellfish about 4 m x 5 m in extent on side of a small dune, about 20 m west of 053. 12 quartz flakes and chunks, 2 silcrete flakes, 14 weathered pieces of OES counted in a 1 x 1 m <sup>2</sup> . Shellfish is dominated by limpets (mainly <i>C. granatina</i> ) and some <i>S. argenvillei</i> and larger fragments of some Black mussel. A few pieces of tortoise bone also found. 15 m to the south is a small patch of shell dominated (95%) by limpets and a few quartz flakes and OES |
| 056          |                                    | S29 15.332 E16 54.649 | A small patch of limpet ( <i>C. granatina</i> ) and black mussel, quartz chunks, and chips, 2 quartzite flakes. A few pieces of OES. Some very dispersed shellfish also lying about.   |
| 057          |                                    | S29 15.336 E16 54.626 | A very thin, dispersed scatter of quartzite and quartz (chunks and flakes). 1 silcrete flake, in a wind deflated patch of compact sand. Relatively large numbers of OES, many hundreds of land snails ( <i>Acatina</i> ), and some dispersed and fragmented and weathered shellfish. Lots of glass, rusted metal, plastic and debris lying about.  |
| 058          |                                    | S29 15.315 E16 54.555 | Dispersed and very fragmented shellfish, and quartz including a few flakes, chunks and at least 1 small round core, and 2 silcrete flakes, in a deflated patch of sand alongside a small track.  |
| 059          |                                    | S29 15.349 E16 54.512 | A few quartz chunks and flakes and some fragments of very weathered adiaagnostic shell, including a few pieces of weathered OES in a large degraded path. Several smaller tracks converge here, in an area that is littered with plastic and debris  |
| 060          |                                    | S29 15.467 E16 54.409 | Tiny fragments of adiaagnostic limpet, a few quartz flakes and chunks, 1 core, 2 silcrete flakes, some weathered OES, occur on compact sands in a wide eroded path in the basin on the edge of a series of low, partially vegetated dunes. Site and surrounding  |

Archaeological study proposed Port Nolloth Waste Refuse Site

|     |  |                       |   |
|-----|--|-----------------------|---|
|     |  |                       | area is very degraded. 2-tracks roads, lots of dumping of debris  |
| 061 |  | S29 15.429 E16 54.350 | Some weathered shell fragments ( <i>S. argenvillei</i> and adiaagnostic limpets), including a few quartz flakes and chunks, 2 quartzite chunks, 1 flake and 1 core, 1 small lump of silcrete, alongside a very degraded dune hummock, 2-track roads, lots of plastic and glass and other debris lying about.  |
| 062 |  | S29 15.379 E16 54.305 | Some dispersed stone in a small wind deflated path  |
| 063 |  | S29 15.286 E16 54.395 | Several quartz flakes and chips, and a few quartzite flakes occur alongside a degraded path near a deflated dune hummock, Lots of land snail ( <i>Acatina</i> ).  |
| 064 |  | S29 15.271 E16 54.372 | A low density scatter of quartz and quartzite flakes and some very weathered fragments of adiaagnostic shell (limpet), a few small pieces of weathered OES in a small path and wide deflated area, about 50 m from the wide gravel road. Lots of <i>Acatina</i> and small nodules of calcrete.  |
| 065 |  | S29 15.386 E16 54.476 | Very small, thin scatter of shell fish, mainly <i>C. granatina</i> and some Black Mussel on soft sands. No stone or other cultural remains  |
| 066 |  | S29 15.421 E16 54.509 | A few fragments of weathered adiaagnostic shellfish, several quartz, silcrete and quartzite flakes and chips, 1 <b>MSA</b> silcrete flake, some weathered bone and OES in a degraded path alongside a large wind deflated 'dune'. Surrounding area is very degraded and littered with debris such as plastic and glass.   |
| 073 |  | S29 15.254 E16 54.676 | Weathered tiny fragments of adiaagnostic shellfish (probably limpets) and some large whole shell including <i>S. argenvillei</i> and <i>C. granatina</i> alongside an eroded dune on compacted sands that are covered in small nodules of calcrete, <u>outside the footprint area</u> of the proposed site. Low density scatter of stone artefacts including quartz and quartzite flakes and chunks, 1 round quartz core, 2 silcrete flakes, a few pieces of weathered OES and bone, broken 19 <sup>th</sup> Century case bottle.   |
| 074 |  | S29 15.272 E16 54.662 | A thin scatter of adiaagnostic shell (limpets) including some large whole shell, including <i>S. argenvillei</i> , and <i>C. granatina</i> , quartz flakes and chunks, large utilized quartz flake, 2 quartzite flakes, 1 banded ironstone flake, on soft sands covered in <i>Acatina</i> (land snails). Some weathered bone including bird. Another patch of shell occurs about 15 m to the south, that includes a few quartz flakes and chunks, 1 silcrete flake/bladelet and a few pieces of weathered OES. Site also <u>outside the proposed footprint area</u> .                                   |
| 075 |  | S29 15.267 E16 54.652 | Is an extension of 074, and includes a mound ( $\pm$ 2.5 x 6 m) in extent), of well preserved shellfish on compact sands. Shellfish is dominated by lots of limpets ( <i>S. argenvillei</i> and <i>C. granatina</i> ), as well as fragments and larger pieces of Black Mussel and some <i>C. miniata</i> . Stone includes a low density scatter of quartz flakes and chunks, large irregular quartz core, 1 banded ironstone flake, 1 silcrete flake, 1 large quartzite flake and 2 smaller quartzite flakes, and a few manuports. Relatively large numbers of OES. <u>Outside the footprint area</u> . |

Table 1. Spreadsheet of waypoints and description of archaeological finds

Archaeological study proposed Port Nolloth Waste Refuse Site

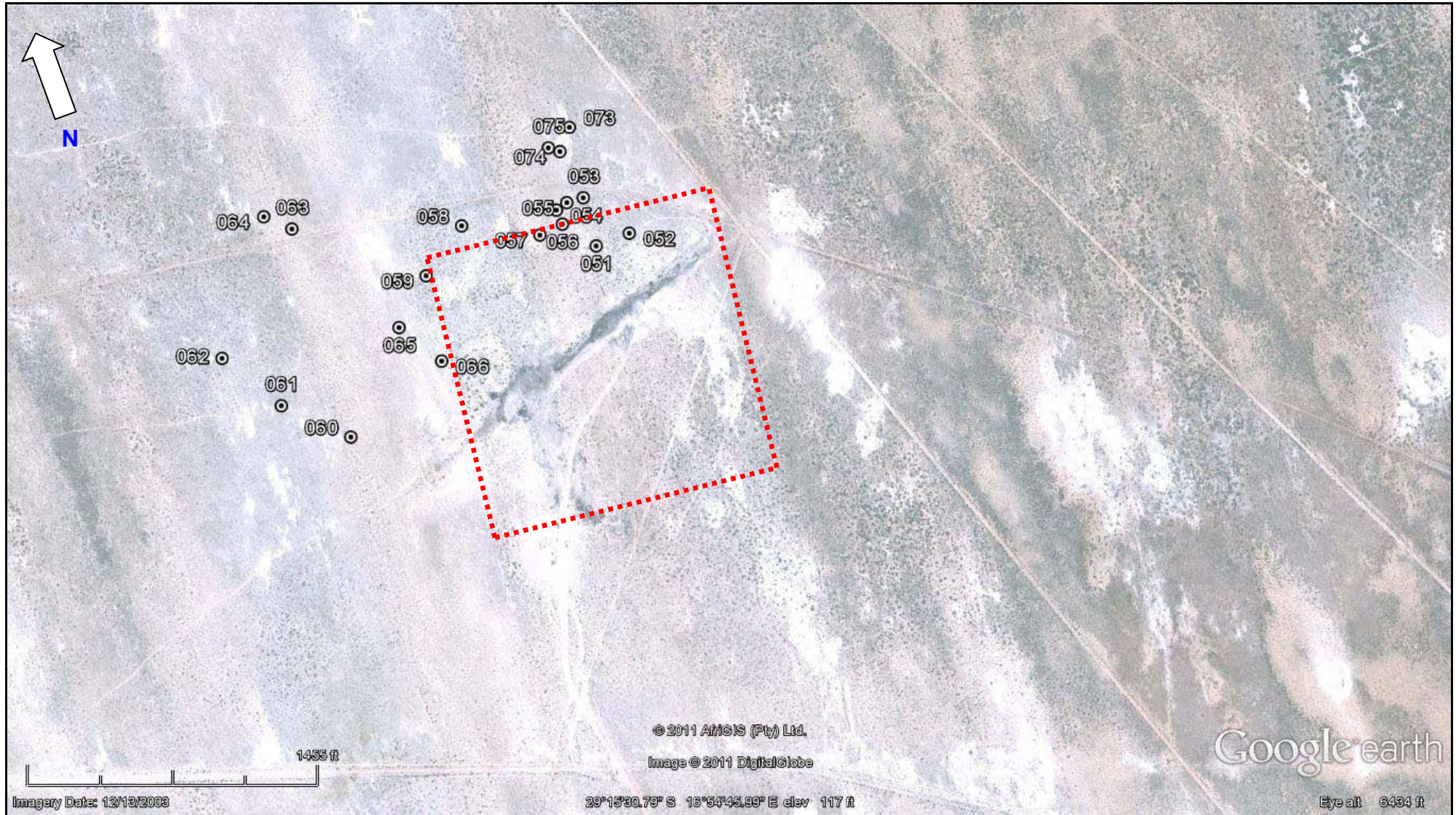


Figure 26. Approximate boundary of the proposed Port Nolloth Waste Facility on Remainder Erf 516. Illustration of archaeological occurrences