SAHRA CASE ID: 12651

ARCHAEOLOGICAL IMPACT ASSESSMENT

PROPOSED ABALONE HOLDING AND PROCCESSING FACILITY ON THE FARM ROOIKLIPPE, NEAR KLEINZEE NORTHERN CAPE

Report prepared for

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On behalf of

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Executive summary

1. Introduction

ACRM was appointed by Port Nolloth Sea Farms Ranching (Pty) Ltd to conduct an Archaeological Impact Assessment for a proposed abalone processing and holding facility near Kleinzee in the Northern Cape Province.

The site for the proposed facility is located 6kms south of Kleinzee on state owned land, on the farm Rooiklippe. The applicant has previously leased the land from De Beers Namaqualand Mines up until about 4 years ago, when ownership was transferred back to the state.

The proposed development site is severely degraded and transformed due to historical diamond mining operations.

The specialist archaeological study was requested by the South African Heritage Resources Agency (*SAHRA Case Id: 11907*).

The Namaqualand coast is a known sensitive, threatened and vulnerable archaeological landscape.

Anchor Environmental is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process for Environmental Authorization.

2. The development proposal

The proposed development will include holding tanks, fuel tanks, sheds, septic tanks, packing room, diver's quarters, and powerline discharge pipes. The existing seawater intake infrastructure will also be upgraded. Electricity will be provided by the Nama Khoi Municipality via the existing servitude. The site will be fenced for security purposes. The extent of the footprint area is about 2.0ha, but not all of the site will be developed. Most of the proposed infrastructure will be located in previously disturbed areas.

3. Aim

The overall purpose of the study is to assess the sensitivity of archaeological resources in the proposed development site, 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 of the proposed development site was undertaken by ACRM in January 2018 in which the following observations were made:

- Traces of archaeological resources of *low* (Grade IIIC) significance were recorded in the 2.0ha footprint area, but the remains occur in a severely disturbed and degraded context. A few quartz stone flakes and some indigenous Cape Coastal pottery were also found.

- *In-situ* shell midden deposits of *medium* (Grade IIIB) significance were recorded south of the boundary fence in the south western portion of the proposed development site, inside the privately-owned Strandveld Conservation Area.

5. *Impact Statement*

Indications are that a proposed abalone processing and holding facility on the farm Rooiklippe will not have a significant impact on archaeological heritage. Shell midden deposits in the footprint area have been destroyed by historical diamond mining and prospecting activities.

The impact significance of the proposed development on archaeological heritage is assessed as low, and therefore there are no objections to the proposed project proceeding.

Buried shell midden deposits may, however, be exposed during construction activities in the north eastern portion of the proposed development site (i. e. the diver's quarters).

Unmarked Khoisan graves may also be uncovered or intercepted during construction operations and excavations for services.

6. Conclusion

The results of the study indicate that a proposed abalone processing and holding facility on the Farm Rooiklippe south of Kleinzee will not impact significantly on threatened archaeological resources, as the majority of the remains are severely degraded as a result of historical diamond mining operations.

Buried shell middens and unmarked Khoisan graves may, however, be exposed or uncovered during construction activities

Well-preserved archaeological deposits were, however, recorded south of the fence line in the protected Strandveld Conservation Area and the integrity and context of these sites must be maintained throughout the Construction and Operational Phase of the proposed development.

7. Recommendations

1. Shovel testing must be conducted in the north eastern portion of the site (the proposed location for the diver's quarters), to determine the significance of sub surface archaeological deposits.

2. The fence alongside southern boundary of the property must be repaired, and should act as a barrier to entry where vulnerable and threatened archaeological sites are known to occur.

3. Contractors, workers and future plant employees must not enter the Strandveld Conservation Area. The area must be declared a, `No Go Area' due to the presence of sensitive archaeological deposits.

4. The Environmental Control Office/Environmental Site Manager must be briefed by the archaeologist prior to construction activities commencing.

5. Should any unmarked human burials/remains or ostrich eggshell water flask caches for example, be uncovered, or exposed during construction activities, these must immediately

be reported to the South African Heritage Resources Agency (Ms Natasha Higgit 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.

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

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1. INTRODUCTION

ACRM was appointed by Port Nolloth Sea Farms Ranching (Pty) Ltd to conduct an Archaeological Impact Assessment for a proposed abalone processing and holding facility on the farm Rooiklippe south of Kleinzee in the Northern Cape Province (Figures 1 & 2).

The applicant has previously leased the land from De Beers Namaqualand Mines up until about 4 years ago, when ownership was transferred back to the state.

The specialist archaeological study was requested by the South African Heritage Resources Agency (*SAHRA Case Id: 12651*).

The Namaqualand coast is a known sensitive and highly threatened and vulnerable archaeological landscape (Kaplan 1993).

Anchor Environmental is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process for Environmental Authorization.

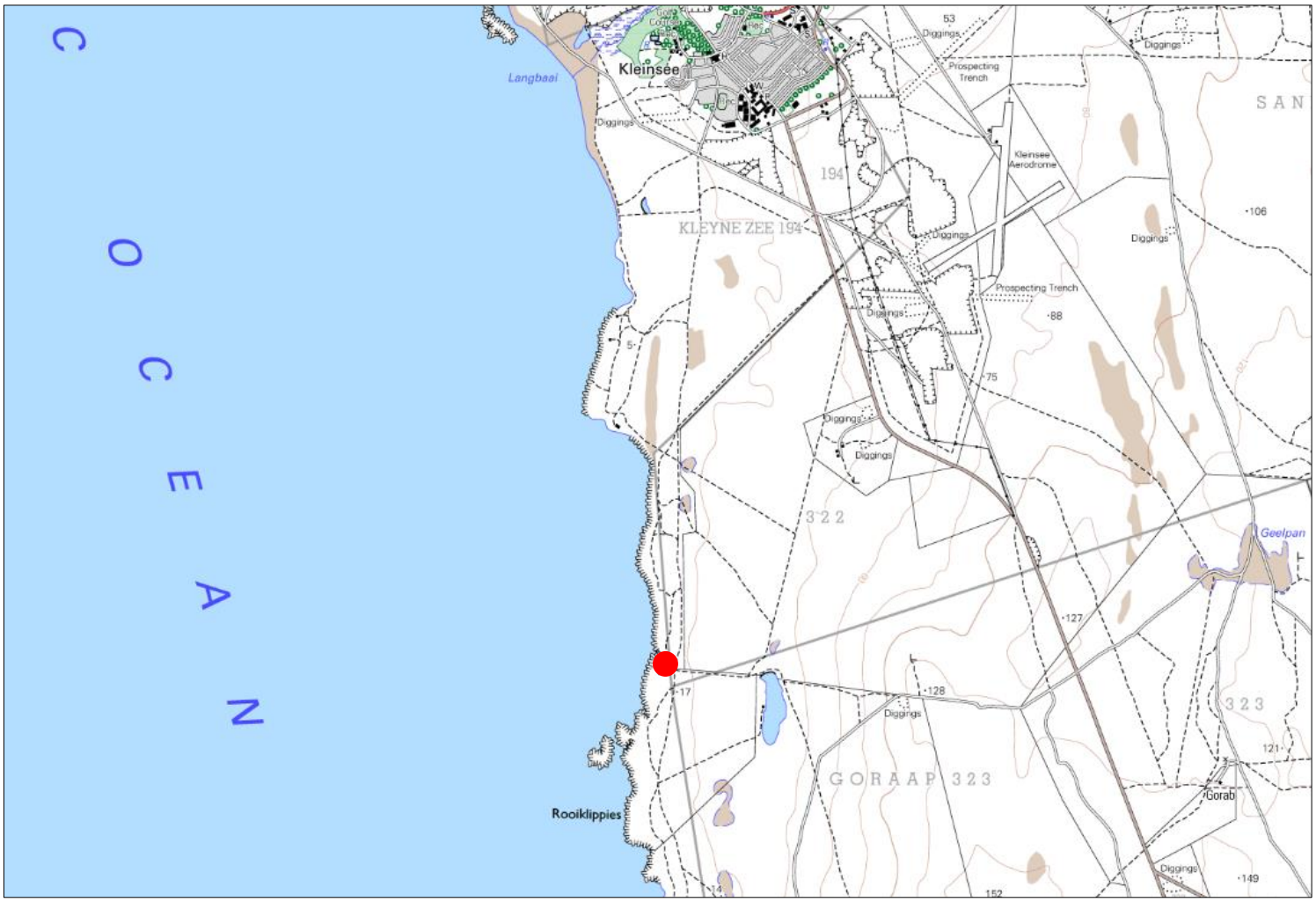

Figure 1. Locality map. 1:50 000 topo-cadastral sheet 2916DB & 2917CA Kleinsee. The red polygon is the study area

Figure 2. Google satellite map indicating the location of the study area (red polygon) south of Kleinzee

2. THE DEVELOPMENT PROPOSAL

Port Nolloth Sea Farms Ranching (Pty) Ltd) currently ranches abalone in the Northern Cape Concession Area 3 and is in need of an abalone holding and processing facility to support the abalone ranching business.

Juvenile abalone will be sourced in Hermanus and will be acclimatized and reared in holding tanks for a few months at the proposed holding facility south of Kleinzee until they are ready to be seeded. Concurrently, harvested abalone will also be kept in the holding tanks until enough abalone have been harvested for shipment to the target market. A layout plan for the proposed facility is shown in Figure 3.

As part of this development, the (existing) seawater intake infrastructure will be upgraded (a pump house and intake lines already exist due to previous mining activities in the area). Effluent originating from abalone tanks is known to be very clean with low concentrations of nutrients and waste products. It is therefore proposed that the effluent outfall channel will be open for effective maintenance and that the effluent is discharged at the high water mark as is the practice with many other abalone aquaculture facilities.

A processing facility is also proposed, where abalone can be de-shelled, gutted, dried or frozen and packed for export. The abalone waste will amount to approximately 3200kg per year and will be discarded at a registered landfill site. Amenities for employees and security staff will also be constructed. In addition to a demarcation fence around the leased area, a security fence will be erected around the abalone holding tanks.

Electricity will be provided by the Nama Khoi Municipality via the existing servitude. The applicant also proposes to build an electricity transformer in the south-eastern corner of the

proposed site. The abalone holding facility relies on fresh seawater supply to operate successfully and has minimal potable water requirements, which is supplied by the applicant as required.

Most of the proposed infrastructure will be located in previously disturbed areas. The extent of the proposed development site is about 2.0ha, but not all of the site will be developed

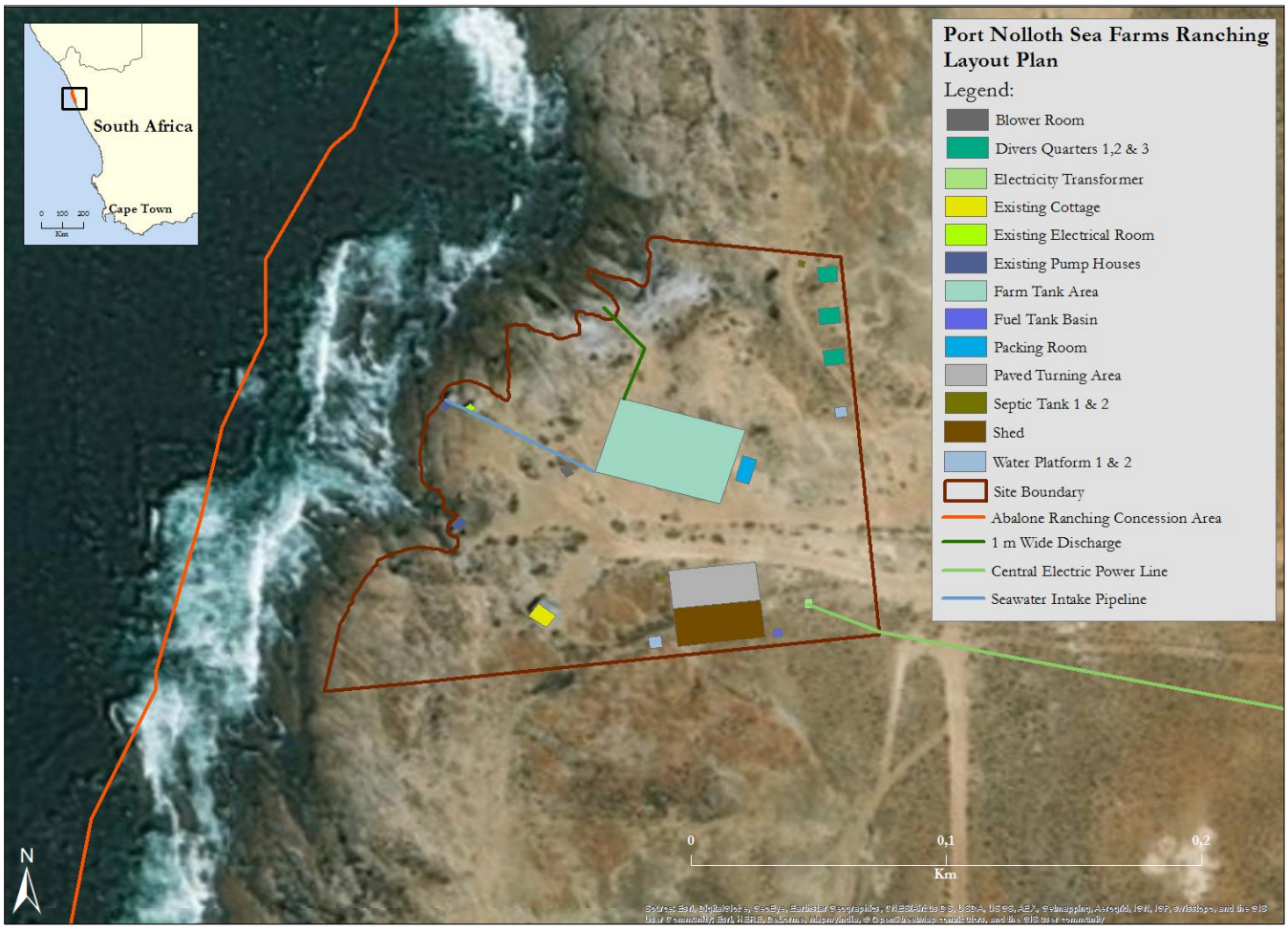

Figure 3. Proposed site development plan.

3. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, shipwrecks, 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 provincial level.

According to the Act (Sect. 35), it is an offence to destroy, damage, excavate, alter of 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.

SAHRA was duly notified of the proposed upgrading, and in a letter to the applicant (*Case Id: 12651*), requested that a Heritage Impact Assessment (or HIA), comprising an archaeological impact assessment must be undertaken, as part of the environmental application process.

4. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

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

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

- Identify possible `No-Go` areas, and

- Recommend mitigation action

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The proposed development site is located on state-owned land on the farm Rooiklippe, about 6kms south of Kleinzee on the Namaqualand coast (Figure 4). The applicant previously leased the land from De Beers Namaqualand Mines up until about 4 years ago. The property has been heavily impacted by mining activities and constitutes a severely degraded and transformed landscape (Figures 5 & 6). The shoreline area is characterized by wave cut rocky platforms. Existing infrastructure includes a generator room, pump house, overhead powerline lines, access roads, a wooden shack and Jo-Jo water tank. Diggings, trenching are evident, and most of the top soils has already been removed from the site. Spoil dumps are widespread.

Figure 4. Google satellite image of the subject property including existing infrastructure. Note the extremely degraded context of the site

Figure 5.

Figure 6. View of the site facing west, taken from the Strandveld Conservation Area. Note the fallen down fence

6. STUDY APPROACH

6.1 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 10 January, 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 site.

6.2 Constraints and limitations

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

6.3 Identification of potential risks

Indications are that the proposed development will not have a significant impact on important archaeological heritage. Buried shell midden deposits may, however, be exposed during construction activities in the north eastern portion of the proposed development site (i. e. divers quarters). Unmarked Khoisan graves may also be uncovered or intercepted during construction related operations.

7. HERITAGE CONTEXT

The Namaqualand coast is an arid landscape, receiving less than 150mm of rain a year. Its rocky coastline, however, is extremely productive, teeming with shellfish, crayfish, marine birds and mammals. The shoreline area attracted pre-colonial Stone Age hunter-gatherer, as it offered opportunities for the exploitation of marine foods, particularly shellfish. The environment also supports a wide variety of terrestrial animals that are available for human subsistence.

More than 1500 archaeological sites have been recorded on the Namaqualand coast (Kaplan 1993). Most of these sites have been recorded by the Archaeology Contract Office (ACO), who has shown that there is an almost continuous distribution of shell middens along the rocky shoreline, adjacent to dune ridges and sandy beaches. The majority of sites have been identified while conducting surveys ahead of mining operations on land owned by De Beers, and Namakwa Sands (Halkett 1998, 2001, 2002, 2003, 2006; Halkett & Hart 1987; Hart & Halkett 1993, 1994a, 1994b 1999; Hart & Lanham 1997; Parkington & Hart 1993; Parkington & Poggenpoel 1990; Orton 2005, 2007a; Orton & Halkett 2005; Orton & Halkett 2006). With the recent discovery of offshore gas deposits, and strategic mineral sands in the vicinity Groenrivier, an even large number of shell middens and hunter-gatherer campsites have been added to the Namaqualand data base (Kaplan 2014, 2007; Orton & Hart 2011).

Ephemeral scatters of LSA sites containing stone tools, marine shellfish, ostrich eggshell and pottery have also been documented on the coastal plains south of Groenrivier (Orton

2007, & pers. com. 2014). Rocky outcrops and boulders were also targeted by Stone Age people and several such rock shelters with archaeological deposits, shellfish, stone tools, pottery, ostrich eggshell and even rock art have been recorded near Kotzesrus (Orton & Hart 2011). Webley & Halkett (2010) also encountered a LSA site with stone tools, pottery, ostrich eggshell fragments and some 19th Century British refined earthenware on the banks of the Swartdoring River, as well as large scatters of Middle Stone Age (MSA) LSA and ESA lithics, about 30kms south of Garies, more than 40kms inland of the coast..

Closer to the study area, well preserved LSA sites have been recorded at the Kleinzee Golf Course (Hart & Halkett 1997) and a collection of Early Stone Age (ESA) tools were also made by Halkett (2002) from the Sandkop mining area in Kleinzee. The ACO has also conducted numerous surveys and mitigation of sites in and around Kleinzee while Halket (2006) has documented both ESA and Middle Stone Age (MSA) scatters several kilometres inland of the town.

Research has revealed that parts of Namaqualand were occupied by ESA people more than a million years ago (Dewar (2006, 2007), but the greatest number of sites (i. e. coastal shell middens), are those which relate to the ancestors of modern San (hunter gatherers) and Khoekhoen (Herders) which date to the last 4-5000 years (Webley 1992), although recent work suggests there is much variety in age, with some sites being only a few hundred years old (Orton 2007b). Sites with pottery post-dating 2000 years are also reported from a number of sites in Namaqualand. These ceramic LSA sites are believed to be associated with the introduction of pastoralism to the region about 2000 years ago, and Webley (2001) has obtained some of the earliest dates for sheep from Spoegrivier Cave near Hondeklipbaai, about 1900 years ago.

Excavations at several sites between Brandsebaai and the Orange River mouth have shown that MSA people have also been exploiting coastal resources since the Last interglacial period about 120 000 years ago (Hart 2006; Parkington 2006), and scatters of ESA handaxes more than 500 000 years old have also been found amongst sand dunes on the coastal plains and around pans in a survey of the Namaqua National Park (Morris & Webley 2004).

Historically, the interior of Namaqualand was occupied by the Little Namaqua, a Khoekhoen pastoralist group, who herded sheep and cattle and lived in temporary encampments of mat houses. They are known to have moved seasonally with their livestock and historical reports indicate that they may have followed a transhumance cycle between the Kamiesberg in the summer months and the Sandveld in the winter months (Webley 1992). Early traveller reports relating to Little Namaqua settlement in the area is summarized in Webley (1992). For example, the Governor Simon van der Stel who travelled to Namaqualand in 1685, found the first Namaqua kraals north of the Doornboschrivier, which it is believed, is a reference to the Groenrivier (Webley & Halkett 2010). Since the Little Namaqua had no clearly defined territorial boundaries, it was easy for the colonial Trekboers to settle in the area. The earliest loan farms were granted after 1750 and the Little Namaqua eventually retreated to so-called “reserves” such as Leliefontein, Steinkopf, Kommaggas, Concordia and the Richtersveld (Webley & Halkett 2010).

7.1 Graves

Historical graves are usually well marked and mostly occur in small farm graveyards. Pre-colonial graves, on the other hand, can occur at any location where sand suitable for excavation and burial exists. This is particularly the case in the coastal area where dunes abound. Pre-colonial graves are unmarked, and have been found at various locations throughout the western coastal region of South Africa (Morris 1982), including several on the

Namaqualand coast. For example, a burial was excavated near Noup south of Kleinzee (Hart & Halkett 2001), while a number of burials are listed as having come from the area at the mouth of the Buffelsrivier (Morris 1992). A human burial was also found at the mouth of the Groenrivier (Jerardino *et al* 1992), while several Khoisan skeletons were exposed in a large excavation alongside the road near the mouth of the river (Petrus Schreuder Namanqua National Park, pers. comm. 2014).

The location of pre-colonial graves cannot be predicted and no plans can be made to avoid intersecting burials during construction activities.

8. FINDINGS

Archaeological remains recorded during the study are illustrated in Figure 7.

A spreadsheet of waypoints and description of the finds is presented in Table 1.

Traces of archaeological resources were encountered across the 2.0ha footprint area, but most of these remains occur in a severely degraded and disturbed context as a result of historical diamond mining operations.

Shell midden deposits (Site 8121) were recorded in an old, 12m long x 1.5m deep, prospecting trench in the south eastern portion of the proposed site, alongside the fallen down fence line. No natural stratigraphy occurs in the trench wall, but displaced shellfish deposits and a few quartz stone flakes and chunks were noted on the limestone bedrock, as well as on the sloping side walls of the trench. A pile of weathered shell midden deposits is also visible on the spoil dumps at the western end of the trench (Figures 8-10). Shellfish remains are dominated by the limpets *Scutellastra argenvillei*, with some *Cymbula granatina* occurring. A small number of quartz and quartzite stone flakes, chunks and a core were collected from the surrounding area, including five small fragments of undecorated, Cape Coastal LSA pottery (Figures 11 & 12). No bone or ostrich eggshell was found. Due to the highly degraded context in which they were found, the remains have been graded as having *low* (Grade IIIC) significance.

Shell midden deposits (Sites 8211 & 8231) were recorded in a ± 30m long prospecting trench alongside a large, degraded patch of land in the northern portion of the site, where most of the top soils have been removed. Dispersed scatters of shellfish are visible on the limestone bedrock in the trench, on the side walls and alongside the trench, where they have been deposited with the associated spoil dumps (Figures 13-15). Shellfish is dominated by limpets *S. argenvillei* with some *C. granatina* occurring. A few pieces of quartz were noted, but no pottery, ostrich eggshell or bone was found. The remains have been graded as having *low* (Grade IIIC) significance.

A dispersed scatter of weathered and fragmented shellfish (Site 8221) was recorded on a level piece of relatively undisturbed land in the north eastern corner of the proposed site (the proposed diver's quarters) (Figure 16). The shellfish is dominated by limpets *S. argenvillei* and some *C. granatina.* A few pieces of quartz were found, but no pottery or ostrich eggshell was noted. The remains have been graded as having *low* (Grade IIIC) significance.

A thin scatter of weathered marine shellfish (Site 8191) of *low* (Grade IIIC) significance was recorded in the northern portion of the proposed site, but no pottery, stone flakes, bone, or ostrich eggshell was found. No development will take place in this area.

Partially destroyed/crushed, shell midden deposits (Site 8161) occur behind the wooden shack and green Jo-Jo tank alongside the fence in the south western corner of the property (Figure 17). Broken glass, rusted metal items and debris were also noted lying around. Some *in-situ* shell midden deposits (the same site) occurs on a sandy bank against the shale rock outcrop just a few meters south of the fallen down fence, in the protected Strandveld Conservation Area (Figure 18). A few quartz flakes were found, but no ostrich eggshell, bone or pottery was noted. The shellfish is dominated by limpets (*S. argenvillei*). The remains have been graded as having *low* (Grade IIIC) to *medium* (Grade IIIB) significance.

Traces of isolated and fragmented shellfish were noted over the remainder of the footprint area, but these were so insignificant they were not assigned GPS-co-ordinates.

8.2 Other finds

Well-preserved/*in situ* shell midden deposits (Sites 8171 & 8181) were recorded in the privately-owned Strandveld Conservation Area about 20m south of the collapsed fence in the south western portion of the footprint area. A few quartz stone flakes including a hammerstone, and a fragment of Cape Coastal pottery were also found (Site 8171). The shellfish is dominated by limpets *S. argenvillei*, with some *C. granatina* also present (Figures 19 & 20). Some burnt shell was also noted (Site 8181). These well preserved deposits have been graded as having *medium* (IIIB) significance.

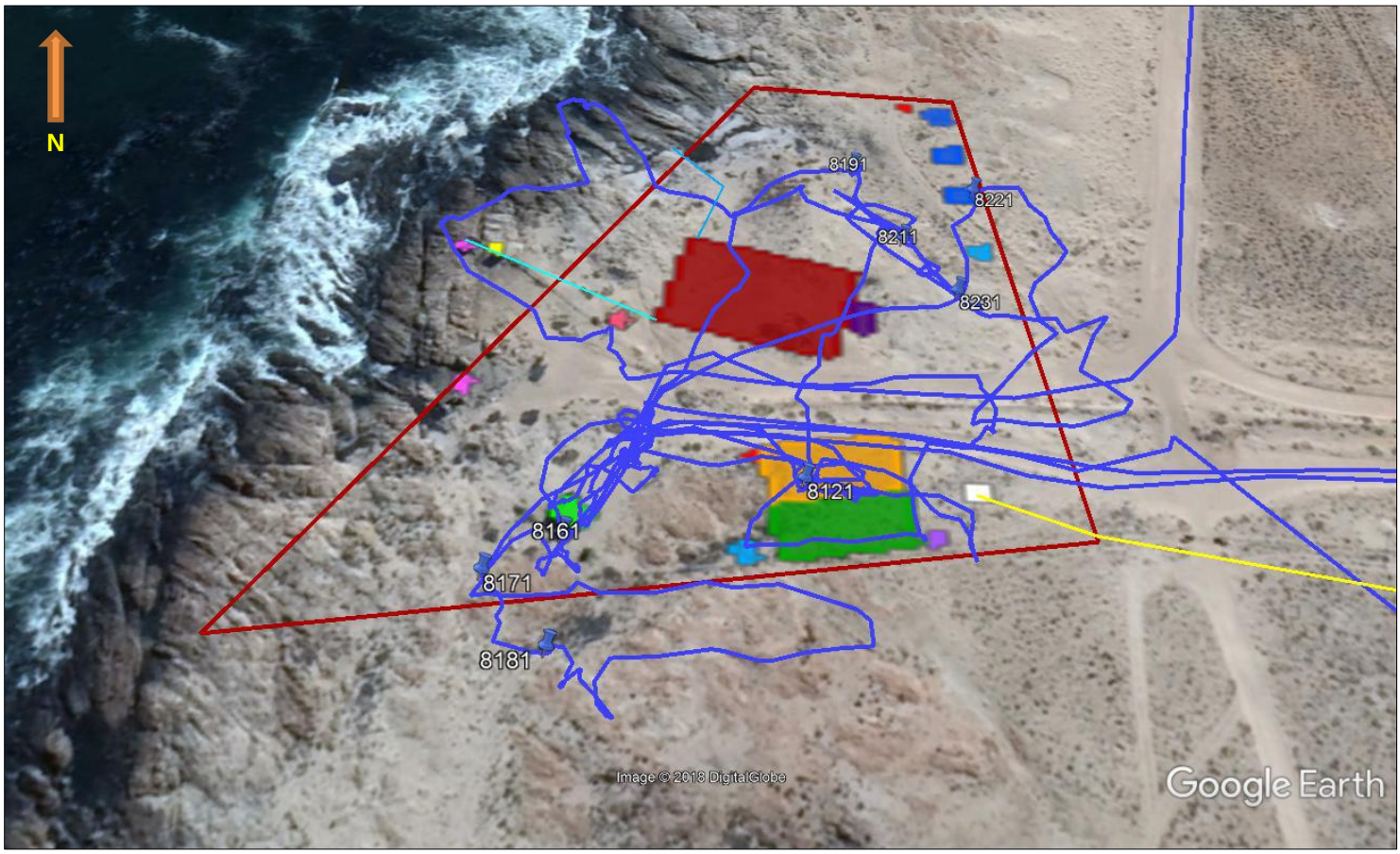

Figure 7. Track paths (in blue) and waypoints of archaeological finds overlaid onto the proposed site layout plan

Site	Name of farm	Late/long	Description of finds	Grading	Suggested mitigation
	Rooiklippe				
8121		S29° 43.794' E17° 03.640'	Shell midden deposits exposed in a 12m long prospecting trench alongside the south eastern portion of the proposed development site. Deposits have been destroyed. A handful of quartz flakes, chunks and a core were found in the surrounding area, including 5 small fragments of LSA Cape Coastal pottery. 1-2 crude quartzite flakes were also found. No bone or OES.	IIIC	None required
8211		S29° 43.753' E17° 03.658'	Destroyed shell midden deposits in a 30m long trench; shellfish on bedrock deposit and trench side walls. Shellfish dominated by limpets (*S. argenvillei* & some *C. granatina*). 2-3 pieces of quartz but no pottery or OES	IIIC	None required
8231		S29° 43.763' E17° 03.666'	Scatter of displaced shellfish (*C. granatina*) including some whole *S. argenvillei*, in highly degraded, transformed landscape /prospecting trench	IIIC	None required
8221		S29° 43.743' E17° 03.671'	Dispersed fragments of shellfish (mostly limpets (*S. argenvillei* and some *C. granatina*) occur on a level piece of relatively undisturbed land in the north eastern portion of site (proposed divers quarters). 2 pieces of quartz, but no pottery or ostrich eggshell was found	IIIC	Shovel testing to determine significance of subsurface deposits.
8191		S29° 43.738' E17° 03.651'	Dispersed scatter of fragmented and weathered shellfish (limpets). No cultural remains found		None required
8161		S29° 43.801' E17° 03.607'	Damaged and partially destroyed, shell midden deposits behind the wooden shack and green jo-jo tank alongside the fallen down fence, but relatively well preserved deposits occur on a sandy bank alongside the shale rocky platform a few metres south of the fence, in the protected Strandveld Conservation Area. Rusted metal, glass, domestic debris lying around.	IIIC/IIIB	None required
8171		S29° 43.806' E17° 03.596'	Well preserved/*in situ* shell midden deposits on in protected Strandveld Conservation area. A few quartz flakes. No pottery, bone or ostrich eggshell found	IIIB	No-Go area
8181			Well preserved/*in situ* shell midden deposits in protected Strandveld Conservation area. 3-4 quartz flakes and a single fragment of Cape Coastal pottery. No ostrich eggshell	IIIB	No-Go area

Spreadsheet of waypoints and description of archaeological finds

Figure 8. Site 8121

Figure 9. Site 8121

Figure 10. Site 8121

Figure 11. Stone flakes Site 8121. Scale is in cm

Figure 12. Pot sherds Site 8121. Scale is in cm

Figure 13. Site 8211 & 8231

Figure 14. Site 8211 & 8231

Figure 15. Site 8211 & 8231.

Figure 16. Site 8221

Figure 17. Site 8161

Figure 18. Site 8161

Figure 19. Site 8161

Figure 20. Site 8171

Figure 21. Site 8181

9. IMPACT ASSESSMENT

The overall impact significance of the proposed development on archaeological heritage is assessed as LOW (Table 2).

Historical diamond mining and prospecting has destroyed shell midden deposits in the proposed development site. However, traces of relatively undisturbed archaeological deposits (Site 8221) occur in the north western corner of the site (i. e. the proposed diver's quarters).

Potential impact on terrestrial archaeology	
Nature of impact	Damage to, or destruction of archaeological resources
Extent and duration of impact	Localized and short term
Intensity of impact	Low-potentially High (Site 8221).
Probability of occurrence	Low-potentially High (Site 8221)
Degree to which impact can be reversed	Irreversible
Irreplaceability of resources	Low – archaeological resources have already been destroyed as a result of historical diamond mining and prospecting operations
Cumulative impact prior to mitigation	Low
Significance of impact pre-mitigation	Low-potentially High (Site 8221)
Degree of mitigation possible	High
Proposed mitigation	Shovel testing (Site 8221) to determine significance of archaeological deposits. ECO/Environmental Site Officer to briefed prior to construction operations commencing Fence to be repaired and No-Go area in Strandveld Conservation Area.
Cumulative impact post mitigation	Low
Significance after mitigation	Insignificant

Table 2. Assessment of archaeological impacts

10. CONCLUSION

The results of the study indicate that a proposed abalone processing and holding facility on the Farm Rooiklippe south of Kleinzee will not impact significantly on threatened archaeological resources, as most of the remains have already been destroyed or severely degraded as a result of historical diamond mining operations.

Buried shell middens and unmarked Khoisan graves may, however, be exposed or uncovered during construction activities and excavations for services (e. g. septic tanks, discharge pipeline, etc).

Relatively well-preserved, and *in-situ* shell midden deposits were recorded in the protected Strandveld Conservation Area (Sites 8161, 8171 & 8181).

11. RECOMMENDATIONS

With regard to a proposed abalone processing and holding facility on the Farm Rooiklippe near Kleinzee, the following recommendations are made.

1. Shovel testing must be conducted in the north eastern portion of the site (the proposed location for the diver's quarters), to determine the significance of sub surface archaeological deposits.

2. The fence alongside southern boundary of the property must be repaired, and should act as a barrier to entry where vulnerable and threatened archaeological sites are known to occur.

3. Contractors, workers and future plant employees must not enter the Strandveld Conservation Area. The area must be declared a, `No Go Area' due to the presence of sensitive archaeological deposits.

4. The Environmental Control Office/Environmental Site Manager must be briefed by the archaeologist prior to construction activities commencing.

5. Should any unmarked human burials/remains or ostrich eggshell water flask caches for example, be uncovered, or exposed during construction activities, these must immediately be reported to the South African Heritage Resources Agency (Ms Natasha Higgit 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.

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

12. REFERENCES

Dewar, G.I. 2007. The Archaeology of the Coastal Desert of Namaqualand, South Africa: A regional synthesis. Unpublished PhD Dissertation, Department of Archaeology, University of Cape Town.

Dewar, G. 2006. Survival and culture in the coastal desert of Namaqualand. What people ate and where they sat to eat it. The Digging Stick 23:2. South African Archaeological Society.

Gribble, J. 2018. Maritime Heritage Impact Assessment: Expansion of Diamond Coast Aquaculture Farm on Farm 654, Portion 1, Klenizee, Northern Cape. Report prepared for ACRM on behalf of Anchor Environmental Consulting. Archaeology Contracts Office, Jacobs Ladder, St James, Cape Town

Halkett, D. 2006. Phase 1 Archaeological assessment of mining targets in the BMC Mining Area Namaqualand, July/August 2006. Report prepared for De Beers Consolidated Mines NM. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Halkett, D. 2003 A report on the archaeological mitigation program at De Beers Namaqualand mines March 2002 to June 2003, Report prepared for De Beers Namaqualand Mines Division. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Halket, D. 2002. An analysis of a randomly collected Early Stone Age artefact assemblage from the Sandkop mining area, Kleinsee, Namaqualand. Report prepared for De Beers Namaqualand. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Halkett, D. 2001. An inspection and assessment of specific archaeological sites on De Beers owned properties: Namaqualand coast. Report prepared for De Beers Namaqualand Mines. Archaeology Contracts Office, Department of Archaeology, University of Cape Town

Halkett, D. J. 1998. Phase 1 archaeological survey: assessment of the proposed 1998 mining blocks on the Buffels Marine (BMC), Koingnaas (KN) and Buffels Inland (BI) Complexes. Report prepared for De Beers Consolidated Mines Ltd. Namaqualand Mines. ACO, Department of Archaeology, University of Cape Town.

Halkett, D. and Hart, TJG.1987. An archaeological assessment of the coastal strip, and a proposed heritage management plan for De Beers Namaqualand Mines. Unpublished report prepared for De Beers Namaqualand Mines Division. Archaeology Contracts Office, University of Cape Town.

Hart, T.J.G. 2006. Scoping Heritage Impact Assessment of a proposed wind energy facility to be situated at Bakoond 617, 620 and Grave Water Kop 158/5 situated on the Namaqualand coast in the Vredendal District South Western Cape. Draft Report prepared for Savannah Environmental. Archaeology Contract Office, University of Cape Town.

Hart, T. and Halkett, D. 2001. Recovery of a human burial from the farm Somnaas: Namaqualand. Report prepared for De Beers Namaqualand. Archaeology Contract Office, University of Cape Town

Hart, T. and Halkett, d. 2002. Phase 1 Archaeological survey: assessment of mining blocks in the BMC and KN areas, Namaqualand. Report prepared for De Beers Namaqualand. Archaeology Contract Office, University of Cape Town

Hart, T.J.G. and Halkett, D. J. 1997. An archaeological impact assessment of proposed modifications to the golf course at Kleinzee. Report prepared for De Beers Consolidated Mines Ltd. Namaqualand Mines. ACO, Department of Archaeology, University of Cape Town.

Hart, T.J.G and Halkett, DJ. 1993. Excavations at six archaeological sites in the Near-Shore Diamond Mining Area, Brandsebaai, Namaqualand. Archaeology Contracts Office, University of Cape Town.

Hart, T.J.G and Halkett, DJ .1994. Report on the Phase 2 Archaeological Excavations at the Namakwa Sands Project (first Phase), Vredendal District, Namaqualand, Namakwa Sands Ltd. Archaeology Contracts Office, University of Cape Town.

Hart, T.J.G and Lanham, J. 1997. Phase 2 archaeological excavations at two Late Stone Age sites in the Phase II (WOB) mining area, Namakwa Sands, Vredendal District, Namaqualand, Namakwa Sands Ltd. Archaeology Contracts Office, University of Cape Town.

Jerardino, A. M., Yates, R., Morris, A. G. & Sealy, J. C. 1992. A dated human burial from the Namaqualand coast: observations on cultural biology and diet. South African Archaeological Bulletin. 47:75-81.

Kaplan, J. 2014. Heritage Impact Assessment, Zirco Roodeheuwel Northern Cape Kammiesberg Project, Namaqualand, South Africa. Report prepared for Coastal and Environmental Services, Grahamstown. ACRM, Cape Town

Kaplan, J. 2011. Archaeological Impact Assessment the proposed Port Nolloth Waste Site. Report prepared for Bvi Consulting Engineers. ACRM Cape Town

Kaplan, J. 2007. Archaeological Impact Assessment of the proposed Ibhubesi Gas Field Development and Associated Infrastructure, Northern Cape Province. Report prepared for CCA Environmental. Agency for Cultural Resource Management. Cape Town

Kaplan, J. 1994. The state of archaeological information in the coastal zone of the Orange River to Ponta do Oura. Unpublished report for the Department of Environmental Affairs and Tourism.

Morris, A. G. 1992. A master catalogue: Holocene human skeletons from South Africa. Wits University Press.

Morris, D. & Webley, L. 2004. Cultural History in and adjacent the Namaqua National Park. Unpublished SANParks report.

Orton, J. 2012. Late Holocene archaeology in Namaqualand, South Africa: hunter-gatherers and herders in a semi-arid environment. Thesis submitted for the degree of Doctor of Philosophy, University of Oxford.

Orton, J. 2007a. Phase 1 Archaeological assessment of mining targets in the BIC and KNC Mining Areas, Namaqualand, August. 2007. Report prepared for De Beers Consolidated Mines NC. Archaeology Contracts Office, Department of Archaeology, University of Cape Town

Orton, J. 2007b. The sampling of ephemeral shell scatters in Namaqualand, South Africa. South African Archaeological Bulletin 62:74-78.

Orton, J. 2005. Phase 1 archaeological survey of a small area at Annex Kleinsee, Buffels Marine Complex, Namaqualand. Report prepared for De Beers Consolidated Mines NM. Archaeology Contracts Office, Department of Archaeology, University of Cape Town.

Orton, J. & Halkett, D. 2005. A report on the archaeological mitigation programme at De Beers Namaqualand Mines, August to September 2004. Unpublished report prepared for De Beers Consolidated Mines NM. Archaeology Contracts Office University of Cape Town.

Orton, J. & Halkett, D. 2006. Mitigation of archaeological sites within the Buffels Marine and Koingnaas Complex, November 2005 till May 2006. Unpublished report prepared for De Beers Consolidated Mines NM. Archaeology Contracts Office University of Cape Town.

Orton, J. & Hart, T. 2011. Baseline heritage assessment of electrical and road infrastructure for the proposed Ibhubesi gas power plant in southern Namaqualand, Western and Northern Cape. Report prepared for CCA Environmental. ACO Associates Cape Town.

Parkington, J. 2006. Shorelines, Strandlopers and shell middens. Creda Communications. Cape Town

Parkington, J.E. and Hart, TJG 1991a Archaeological assessment of 3 potential power station sites, De Beers Namaqualand mines, Kleinzee. Unpublished report prepared for the EEU. Archaeology Contracts Office, University of Cape Town.

Parkington, J. & Hart, T. 1991b. An assessment of the archaeological sensitivity of Tweepad, Brazil and Skulpfontein, Kleinzee. Report prepared for De Beers. Archaeology Contracts Office University of Cape Town.

Parkington, J.E and Hart, T.J.G. 1993. Namakwa Sands main access road: archaeological survey, Environmental Evaluation Unit, UCT. Archaeology Contracts Office, University of Cape Town.

Pether, J. 2018. Brief Palaeontological Assessment (Desktop Study). Expansion of Diamond Coast Aquaculture Farm Portion 1 of Farm Kleinzee 654, Kleinzee, Northern Cape Nama Khoi Municipality, Namakwaland Magisterial District. Report prepared for ACRM on behalf of Anchor Environmental Consulting. Archaeology Contracts Office, Jacobs Ladder, St James, Cape Town. John Pether Consulting Palaeontologist, Cape Town

Webley, L. 2001. The re-excavation of Spoegrivier Cave on the West Coast of South Africa. Annals of the Eastern Cape Museums Vol 2: 19-49.

Webley, L. 1997. Jakkalsberg A and B: the cultural material from two pastoralist sites in the Richtersveld, Northern Cape. Southern African Field Archaeology 6:3-19.

Webley, L. 1992. The history and archaeology of pastoralist and hunter-gatherer settlement in the north-western Cape, South Africa. Unpublished D.Phil. thesis: University of Cape Town.

Webley, L. & Halkett, D. 2010. Archaeological (inc. Heritage) Impact Assessment: Proposed prospecting on Portion 2 and Remainder Portion of the Farm Zandkopdrift 537 Garies, Northern Cape. Report prepared for Sedex Minerals (Pty) Ltd. ACO Associates. Cape Town.