ARCHAEOLOGICAL IMPACT ASSESSMENT

ESTABLISHMENT OF AN AMMUNITION DISPOSAL PLANT, SINCLAIR'S DAM 133, DE AAR, NORTHERN CAPE, SOUTH AFRICA

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REPORT TO:

LUCILLE BEHRENS (BKS – Engineering and Management)
Tel: 041 585 2514; Fax: 041 585 8478; Postal Address: P.O. Box 272, Port Elizabeth, 6001;
E-mail: lucillevs@bks.co.za

DR. ANTONIETA JERARDINO (South African Heritage Resources Agency / SAHRA)
Tel: 021 462 4505; Fax: 021 462 4509; Postal Address: P.O. Box 4637, Cape Town, 8000;
E-mail: ajerardino@sahra.org.za

ANDREW TIMOTHY (SAHRA – Northern Cape)
Tel: 053 831 2537; Fax: 053 833 1435; Postal Address: P.O. Box 1930, Kimberley, 8300;
E-mail: atimothy@nc.sahra.org.za

PREPARED BY:

KAREN VAN RYNEVELD (ArchaeoMaps Archaeological Consultancy)
Tel: 084 871 1064; Fax: N/A; Postal Address: P.O. Box 28530, Danhof, 9310 (Bloemfontein);
E-mail: kvanryneveld@gmail.com

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TERMS OF REFERENCE

SANABO Demil (Pty) Ltd [SANABO] applied for environmental authorization from the National Department of Environmental Affairs (DEAT) for the construction of an Ammunition Demilitarization / Disposal Plant (ADP) at the Department of Defence's (DoD) Ammunition Depot and School of Ammunition, on the property Sinclair's Dam 133, near the town of De Aar, Emthanjeni Local Municipality, Northern Cape. DEAT has indicated that an Environmental Impact Assessment (EIA) would need to be undertaken; due to the sensitive nature of the project exemption from certain provisions (mainly public participation) pertaining to the ADP project were granted based on information regarded as classified in terms of the Protection of Information Act, Act No 84 of 1982 (PIA 1982).

BKS (Pty) Ltd has been appointed by SANABO as the independent Environmental Assessment Practitioner (EAP) to undertake the EIA. ArchaeoMaps Archaeological Consultancy has been sub-contracted by BKS (Pty) Ltd to address the heritage / archaeological component of the EIA.

1.1) INTRODUCTION: THE AMMUNITION DISPOSAL PLANT (ADP)

The South African Department of Defence (DoD) is mandated by the Constitution of the Republic of South Africa to, *inter alia*, ensure the availability of ammunition for use by its armed forces, as and when required. This includes ammunition required during training and deployment of forces as well as for the establishment and maintenance of strategic ammunition reserves. Ammunition has a 'shelf life' which upon exceeding will render the ammunition no longer fit for use. Specific types of ammunition may also be rendered redundant due to the decommissioning of specific types of weapons. Specific prescripts are in place regarding redundant and obsolete ammunition including the recycling, treatment and eventual disposal of components and related packaging (BKS 2009).

1.1.1) THE CURRENT DISPOSAL PROCESS AND OBJECTIVE OF THE ADP

The DoD's Ammunition Depot and School of Ammunition, Sinclair's Dam 133, De Aar, Northern Cape, consists of the following main areas: Base area, security area, military airfield and demolition range. The security area is a highly secure area, surrounded by a security fence with access obtained through controlled gates. The area contains in excess of 100 ammunition storage facilities (bunkers) wherein different types of ammunition and calibers are stored (BKS 2009).

Ammunition is stored, handled, treated and destroyed at the DoD's Ammunition Depot and School of Ammunition. Redundant and obsolete ammunition is largely disposed of by conventional methods including (BKS 2009):

1. Open pit burning;
2. Open-air demolition (involving detonating ammunition up to a total nett explosive content of 30kg within the demolition range of the DoD); and
3. Uncontrolled incineration.

Environmental and social impacts resulting from current disposal methods includes noise, shock and vibration in the town of De Aar and surrounding farms, air pollution in the immediate vicinity of the blast site, disposal of metal waste in a burrow pit on the military base (for collection by recyclers) and potential impact on the game residing on the property. In addition, conventional disposal methods have a number of identified shortcomings (BKS 2009):

1. The lack of a controlled disposal environment poses significant health risks for staff members involved in the disposal process;
2. Current legislative and operating restrictions do not allow for the disposal of sufficient quantities of obsolete and redundant ammunition; by implication increasing the risk associated with the storage, warehousing, transport and handling of items;
3. Current disposal methods do not allow for the optimal re-use and recovery of ammunition components; and
4. Difficulty in ensuring consistency and safety of the current disposal process, due to unserviceable ammunition and unfavorable climatic conditions, on the efficiency and predictability of the process.

The objective of the ADP project is to develop a facility of international standard for the safe disposal of obsolete ammunition from the armed forces of South Africa and possibly from other SADC countries. The proposed ADP project will endeavor to provide a facility to demilitarize obsolete ammunition and related components by applying international best standards focusing on the (BKS 2009):

1. Safe disassembly and recovery of ammunition – Video monitored disassembly process in safety cells. The re-use of recovered components and related packaging is envisioned to reduce the need for exploitation or mining of additional natural resources;
2. Treatment and recycling of explosives – Treatment and recycling of the explosive content of certain types of ammunition to facilitate re-introduction of commercial explosives into the market i.e. in the mining and construction industries;
3. Thermal disposal of chemicals – Heat will be used to transform chemicals from explosives and other materials into gases. Gases will then be processed to remove targeted substances in order to comply with the 'clean gases' principle. During the incineration process chemicals will be destroyed. Inert ashes, scrap and other harmless substances will be separated from the gases and disposed of at a licensed waste disposal site; and
4. The disposal of components – Components that could not be treated by any of the above means will be disposed off according to industry standards.

1.1.2) THE PROPOSED ADP OPERATIONAL PROCESS

The ADP's ammunition demilitarization process will comprise of six main phases (BKS 2009):

1. Phase 1 – Intermediate storage

It is estimated that approximately five (new) ammunition storage facilities will be needed, depending on the location of the ADP plant. Ammunition storage facilities will also serve to secure ammunition against unauthorized

handling and external influences and provide the main buffer for a trouble free process flow for the subsequent itemizing, disassembly, disintegration and additional steps.

2. Phase 2 – Itemizing, unpacking and checking of status and type of ammunition

The phase will focus on work stations within deposit areas, transport facilities and special technological devices, with sections screened by means of resistance walls. During this phase ammunition boxes and pallets will be removed from the packing unit, packaging material will be removed and separated and ammunition removed, de-preserved and their condition registered.

3. Phase 3 – Disassembly of the ammunition

The phase will be undertaken in individual work sections separated by resistance walls, but connected by an outside passage and conveyor system. Varying procedures according to ammunition type will mainly comprise of the defusing of impact or time fuses on ammunition, disintegration of dissembled ammunition into component parts and the registration of individual component parts.

4. Phase 4 – Extraction of payloads

This phase constitutes the disintegration of the ammunition component parts and includes the opening of the warheads, shells, cartridges and unscrewing of the base sections, the disintegration of components through the removal of explosive filler by mechanical, thermal or hydro-mechanical means and clean burning or cleaning of empty components in individual work sections. Hereafter explosive material will either be transported to an intermediate storage facility or directly to the thermal treatment plant.

5. Phase 5 – Thermal treatment of explosives

The thermal treatment unit, the focal point in the process, converts materials into less dangerous and hazardous substances. The unit is divided into medium (±600°C) and high (±1,200°C) temperature treatment to ensure safe degeneration and is fed semi-automatically with explosive materials of different weight, contaminated water, mixtures of different propellants and small arm ammunitions. The rotary kiln provides for the separation of charges and discouraging of sympathetic detonations. The support frame, burners, controls and auxiliary equipment allows for continuous control of the kiln conditions and rotation speeds so that the retort can accept a wide variety of energetic waste. The basic solid discharge systems includes an open conveyor belt to transport solid materials discharged to reclamation or disposal containers located at a safe distance away from the rotary kiln.

The purpose of the afterburner is to ensure complete combustion and destruction of hazardous gases. It is designed to retain the exhaust gases for a minimum of 2 seconds at a temperature of 1,200°C. Exhaust gases from the afterburner will flow to the gas cleaning system.

6. Phase 6 – Gas cleaning system

The gaseous, liquid or solid reaction by-products of the thermal disposal process are collected and treated by specialized processes during this phase, briefly described as:

Hot gas from the gas circulation system streams to the armored rotary tube furnace (ARTF) through the hot gas cyclone where the majority of the dust is removed and conducted via a discharge unit in a dry state to the barrel filling. The dust removal process discharges of approximately one third of the circulated hot gas which is fed into the afterburner chamber. In the afterburner chamber the extracted gas is disposed of by means of a multi-component burner, designed for the disposal and energetic utilization of non-flammable liquids which operates at a temperature of 1,200°C with a retention period of 2 seconds.

The wet washing process is composed of a 3-stage and a spray jet washer. Off-gases from the afterburner chamber are cooled down from 170°C to 90°C in the washing process. Through the quenching of the off-gases the recombination of dioxins and furans is prevented and the water vapor content of the off-gases rises. During the wet washing process sour components are washed out and solid particles are removed during venturi washing. The spray jet water is operated in the neutral pH range (pH-value 7) as delicate washing. From the receiver vessel washing water is continuously sent through the filter-press to the solid lock-out; filtrates are either returned to the washing section locked out to the salt lock-out in the desalinization stage. The cleaning sequence is controlled by a fully automatic control device. A lime-carbon mixture is added into the crude gas stream in front of the filter for the reaction of the gases, sour components as well as of the dioxins and furans and eventually disposed off in the ARTF.

In the heat exchanger the flue gas is heated up to 280°C and takes the required energy from the flue gas stream, after the DENOX-stage with a temperature of 320°C. Through the use of an additional gas fired burner, the flue gas is reheated by 50°C. Thereafter a gaseous admixture of ammonia (NH_3) is added into the flue gas main stream. The flue gases, mixed with the NH_3, are then sent to the DENOX reactor.

The ammonia supply consists of four 500kg ammonia transport containers. Liquid ammonia is evaporated in an electrically heated evaporator. In order to fit the ammonia quantity to the nitric oxides (NO_x) concentration in the flue gas, the quantity control valve in the ammonia feed line to the static mixer is selected by means of a nitric oxides measuring instrument. The required quantity of ammonia for the reaction with the nitric oxides to nitrogen and water is controlled. After the ammonia addition the flue gas goes into the DENOX reactor wherein the nitric oxides are selectively catalytically reduced according to the Selectively Catalytic Reduction (SCR) process. The ammonia acts as a reduction medium.

The SCR process produces nitrogen (N_2) and water (H_2O) as final products. The upper temperature limit of 380°C serves as a protection of the catalyst and is based on the properties of ammonia. The catalyst material is composed in such a manner, that at the same time as the reduction of the NO_x, a reduction of the occurring dioxins and furans of the flue gas takes place (with an efficiency level of 96%).

Cleaned flue gases then pass via heat exchangers into the flue gas line to the stack where the clean gas quality is measured for registration of harmful chemicals (e.g. dust particles, NO_2, HCl, O_2, SO_2, flue gas quantity and temperature, as well as the dew point).

Freed washing water is sent to the desalination stage. The feed is self controlled in dependency of the salt load in the desalination stage and occurs discontinuously as it is determined by the product to be disposed of in the reactor. The desalination receiver vessel is designed for an hourly performance of approximately 300ℓ/h of

washing water to be desalinated. A constant filtrate stream consisting of mainly sodium chloride (NaCl)) is pumped from the vessel to the evaporator resulting in a granulated powder from where a conveyor transports the salt into 200ℓ barrels with residual moisture of approximately 5% for intermediate storage. Vapors are withdrawn at the head of the evaporator and condensed in a cooler, which operates with cooling water. The resulting condensate is sent to the plant's internal waste water collecting system. From the waste water collecting system the condensate will be returned as a fresh water replacement to the wet washing. Accumulating residual vapors are withdrawn from the cooler by a ventilator and sent to the spray jet washer. A closed circulation process is achieved through the return and use of internally occurring material streams in the plant.

The gas cleaning equipment ensures to meet the requirements of both the South African air quality legislation as well as the European Directive 2000/76/EG clean air regulations.

1.1.3) TECHNICAL DETAILS OF THE ADP PLANT

The proposed ADP will be approximately 600m x 600m (36ha) in size with its design based on a modular system of technology capable of handling different ammunitions and explosive materials that require demilitarization. Due to the complexity of the ammunition to be demilitarized, the system can be adapted to the requirements of actual and different ammunition types. The detailed basic machinery and infrastructure has the capacity for processing approximately 5,000 tons of gross weight (active payload) per year or 25,000 tons (gross weight) for a period of 5 years. The controlled incineration process has been selected as the basic technology for the disposal of all combustible or explosive substances (BKS 2009).

The proposed ADP will have the following proposed site layout (BKS 2009):

1. Office and social building (30m x 9m);
2. Two scrap collection areas;
3. Demilitarization building (115m x 50m) placed between two protective walls and consisting of a:
    - Cartridge disassembly line;
    - Fuse disassembly line;
    - Underwater sawing system;
    - Hot water trinitrotoluene (TNT) melt out system;
    - Mortar disassembly line; and
    - High speed disassembly line.
4. Thermal treatment plant (50m x 75m) with a protective outside wall;
5. Internal roads; and
6. Fencing surrounding the ADP.

The thermal treatment plant will include a chimney stack of approximately 11–18m in height and with an internal diameter of 300–600mm. The buildings and protective walls will be approximately 4–7m in height. The proposed ADP will also require approximately five storage facilities for ammunition and it has been proposed to utilize the current ammunition storage facilities that are located within the security area of the DOD Ammunition Depot and

School of Ammunition. The use of the existing ammunition storage facilities will depend on the location of the proposed ADP; however should these not be available new storage facilities will be constructed (BKS 2009).

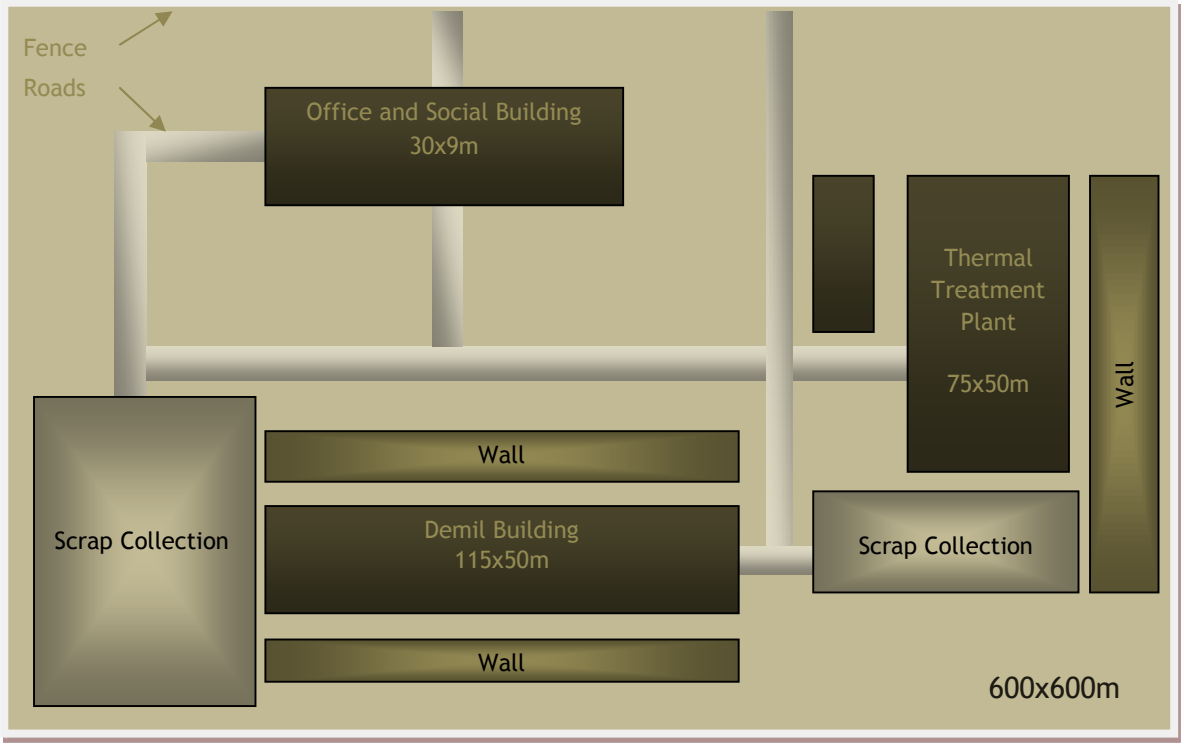


Figure 1: Schematic ADP factory Plan for South Africa (courtesy BKS)

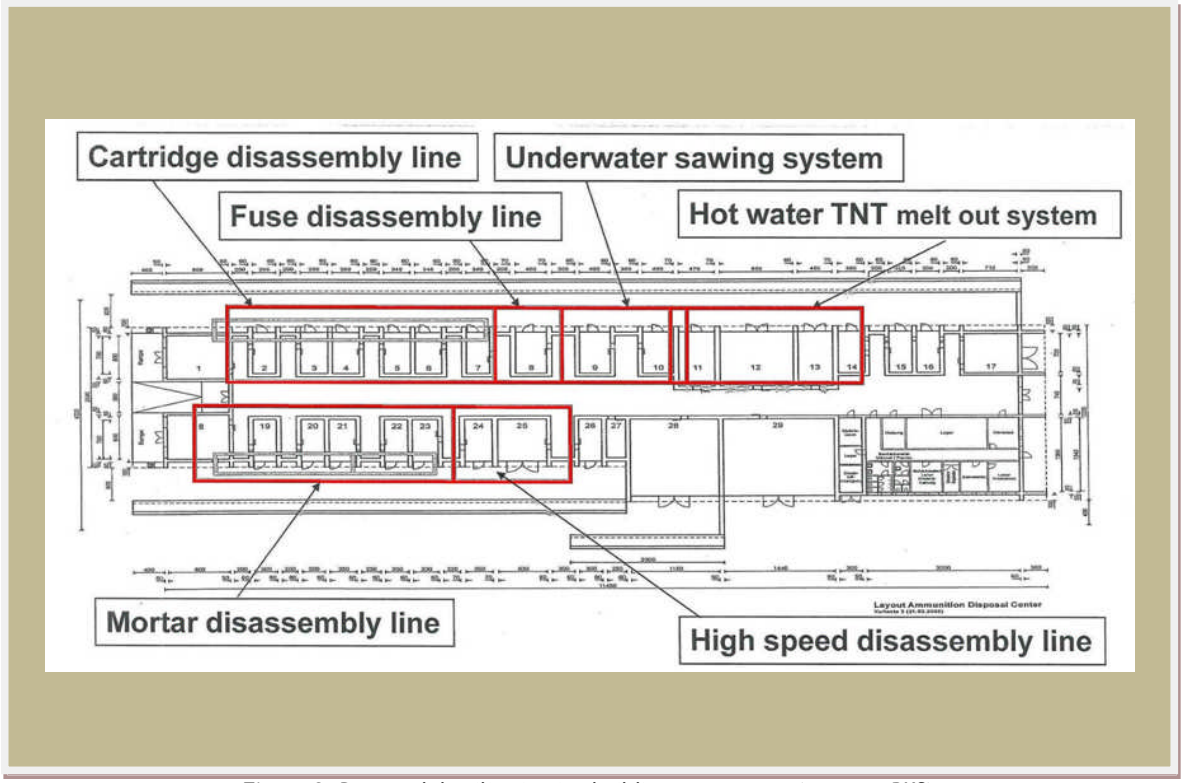


Figure 2: Proposed demilitarization building components (courtesy BKS)

1.1.3.1) ASSOCIATED INFRASTRUCTURAL DETAILS

Roads: An existing main access road, from the N10, serves as access to the DOD Ammunition Depot and School of Ammunition. The existing internal DoD road system would be used as far as possible. New internal roads (paved or tarred) will be constructed within the proposed ADP site as well as to connect the ADP to the existing road infrastructure.

Railway: A railway line (extended from the existing infrastructure) may be required for the proposed ADP and ammunition storage facilities.

Electricity: Electricity required for the proposed ADP and associated buildings will be approximately 1,500,000 kilowatt hours (kWh) per annum and is proposed to be obtained from the existing Eskom supply. The incineration process will be powered by diesel. A backup power system will be incorporated into the proposed ADP during periods of Eskom supply failures.

Telephone lines: The DoD Ammunition Depot and School of Ammunition is provided with communication facilities through Telkom (telephone lines).

Water: The proposed ADP will require approximately 6,000m^3 of water per annum, including the water requirements for domestic and office use. It is proposed that existing boreholes be utilized for the water supply for the ADP and an application to amend the existing water use license will be made to DWAF for the 6,000m^3/annum industrial use.

The proposed ADP will be separated into clean and dirty water circuits. The clean water will feed into the existing storm water systems. The dirty water will be contained and used within the process.

Waste disposal: A Waste Recycling Facility will be established at the proposed ADP and will be used for the temporary storage of waste collected from the demilitarization process. Waste will be stored in separate containers as per waste category (e.g. metal, plastic, paper, cardboard, etc.) to facilitate recycling. The recycling of waste will be in line with the South African Waste Management Strategy. Non-recyclable waste will be disposed of at the nearest registered landfill site.

Sewerage: The sewage effluent from the office block within the ADP will be approximately 2,325 litres per day. It is proposed that the existing sewage treatment plant is used for the disposal and treatment of the sewage effluent.

All wastewater from the actual demilitarization process will be sprayed and disposed of in the thermal treatment plant.

Security: The entire area for the proposed ADP will be enclosed by a security fence.

1.1.3.2) THE CONSTRUCTION PROCESS

The construction process is expected to take approximately 24 months (including the design phase of 6 months) and is planned to commence in 2009/10.

A construction site office will be established on the proposed ADP site area for the required construction of the ADP and associated infrastructure. Strict conditions, including the approval of the location of the construction site office by an Environmental Control Officer (ECO), and for the use and management of resources will be set out in the Environmental Management Plan (EMP) and will have to be adhered to. All contractors that will be appointed will be required to comply with the construction management regulations that will be set out in the EMP as well as compliance to the DOD's Environmental Guidelines for External Construction Contractors on Defence Controlled Properties.

Due to proximity of the town of De Aar contractor staff would not be required to stay on-site and thus a construction camp to house the staff will not be necessary.

The proposed ADP will operate on a continuous basis (24 hours per day) once the thermal treatment plant is functioning.

Figure 3: Open burning (courtesy BKS)

Figure 4: External view of proposed ADP (courtesy BKS)

1) THE ADP ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

An Environmental Impact Assessment (EIA) is essentially a planning and decision making tool. It aims to identify potential positive and negative impacts of a proposed development and recommends ways to enhance the positive impacts and minimise negative ones. In accordance the ADP's EIA aims to address impacts associated directly and indirectly with the project, and provide an assessment of the project in terms of the biophysical, social and economic environments to assist both the environmental authorities (DEAT) and the proponent (i.e. SANABO) in the decision making process. The EIA is undertaken in compliance with the National Environmental Management Act, Act No 107 of 1998 (NEMA 1998), specifically Regulations No. 385, 386 and 387 of 21 April 2006 and with cognisance to other relevant legislation and guideline documents (BKS 2009).

The ADP's EIA consist of three phases:

1. The Scoping Phase;
2. The Impact Assessment Phase; and
3. The Decision-Making Phase.

2.1) DEVELOPMENT LOCATION

The study area falls within the Emthanjeni Local Municipality (ELM) which forms part of the Pixley ka Seme District Municipality (DM) of the Northern Cape Province. The ELM is situated approximately 300km south west of Kimberley, 440km south east of Upington, 300km north east of Beaufort-West and 300km south west of Bloemfontein. The ELM, and especially the town of De Aar, is renowned for its central location on the main railway line between Johannesburg, Cape Town, Port Elizabeth and Namibia (Emthanjeni IDP 2008/2009).

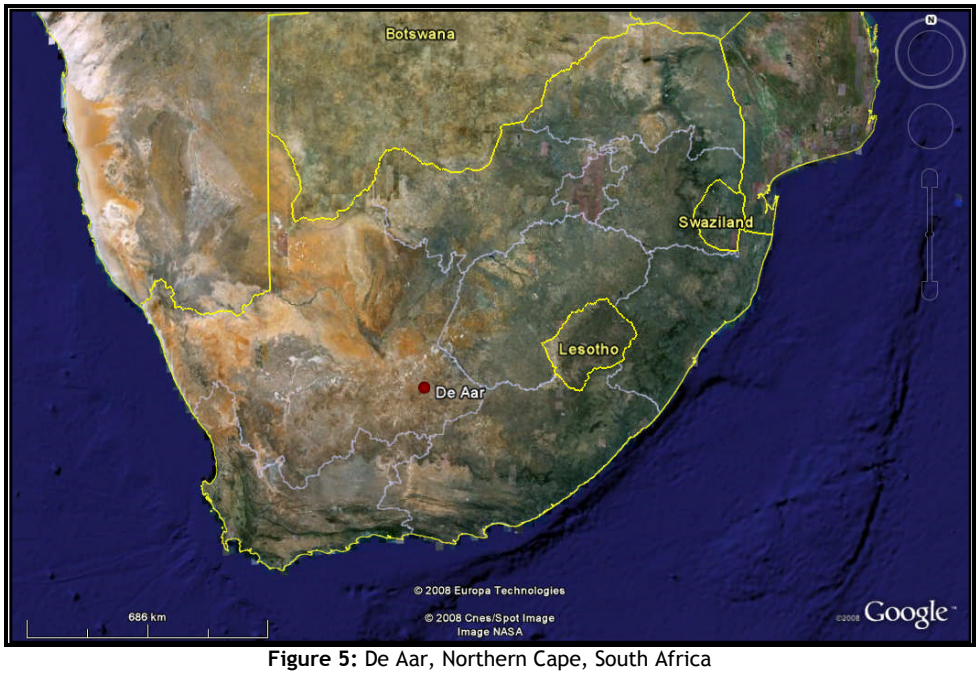


Figure 5: De Aar, Northern Cape, South Africa

The DoD Ammunition Depot and School of Ammunition comprises of the two farms New Vaalkop 132 and Sinclair's Dam 133, covering a total area of 5,394ha. The proposed ADP will be situated on Sinclair's Dam 133. The DOD Ammunition Depot and School of Ammunition is located approximately 5km north west of De Aar, in the Emthanjeni Local Municipality. The N10 national road (Britstown / De Aar) runs through the northern part of Sinclair's Dam 133, forming the eastern boundary of the Ammunition Depot and School of Ammunition. The main railway line constitutes the northern boundary and a gravel road forms the southern boundary (BKS 2009).

Figure 6: Locality of Sinclair's Dam 133 in relation to De Aar, Northern Cape

2.2) THE SCOPING PHASE

During the Scoping Phase of the project 3 site locations were considered for the proposed approximate 600m x 600m (36ha) ADP plant development. In addition the implications of a '*No development*' or '*Do nothing*' option, as emphasized by DEAT was weighed. The main purpose of the Scoping Phase was to identify and define issues that would need to be addressed in the Impact Assessment Phase and for BKS to assess possible environmentally friendly mitigation measures to prevent or minimize envisioned impacts (BKS 2009).

The 3 proposed ADP factory site localities considered can briefly be described as:

1. Site 1 (S30°39'04.5"; E23°55'58.3");
2. Site 2 (S30°38'32.6"; E23°57'18.3"); and
3. Site 3 (S30°39'15.1"; E23°57'45.0").

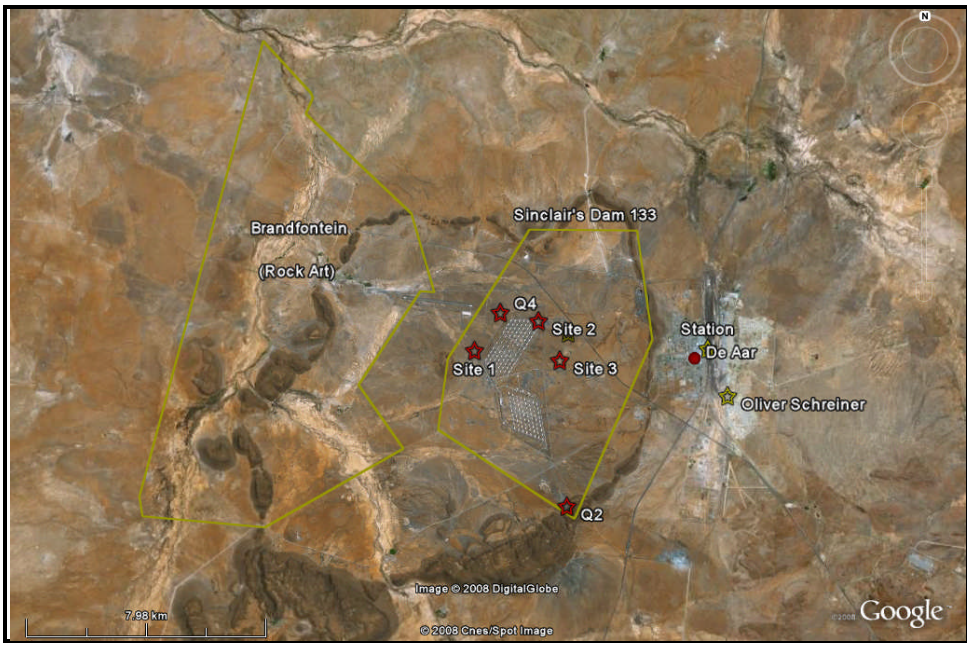


Figure 7: The 3 proposed ADP sites on Sinclair's Dam 133, De Aar, Northern Cape

- Site 1 (S30°39'04.5"; E23°55'58.3")

Site 1 is located to the east of the DoD's demolition range and to the north west of the security area. Electricity and Telkom cables running along the main road would be able to supply the proposed ADP. Despite proximity to the secure area and ammunition storage facilities, new storage bunkers may need to be built. The site lies adjacent to the main internal tarred road from which access to the site is gained; only a minor access road would need to be constructed. The railway line connecting to the main national railway is located relatively close by and if required, only a minor extension to the ADP site would be necessary. The proposed site locality is however in close proximity to the airfield and may require approval from the Civil Aviation Authority (CAA). In addition it is subject to a fluctuating seasonal water table and is seasonally waterlogged; drainage problems requiring special precautions are foreseen (BKS 2009).

Figure 8: General view of the proposed Site 1 ADP development area

- Site 2 (S30°38'32.6"; E23°57'18.3")

Site 2 is located within the north eastern corner of the security area. The available area is limited to only 200m x 300m; as a result the security fence would need to be extended outwards. Proximity to existing ammunition storage facilities would not require new facilities to be constructed. The site lies adjacent to the internal concrete road; only a minor access road would be needed. Access to a railway network would be gained through the existing railway line in the immediate area. A stormwater drainage canal runs through Site 2 and would require re-location. The site is however in line with the airfield's runway and as a result the proposed ADP (especially the stack) will present an obstacle to airplanes (BKS 2009).

Figure 9: General view of the proposed Site 2 ADP development area

- Site 3 (S30°39'15.1"; E23°57'45.0")

The site locality comprises of the already disturbed disused horse stables area, situated approximately 600m east of the security areas' fence and approximately 1km west of the N10. The site is located the furthest from the secure area and ammunition storage facilities; new storage bunkers would need to be built. Electricity and Telkom cables are present in the vicinity. Access to the site is via an existing gravel track from the main internal tarred road; an access road would need to be constructed. There is no railway network in the immediate area and a connecting railway line would be required. The sewage treatment plant is located in close proximity to the site. The presence of calcrete is again indicative of a fluctuating seasonal water table (BKS 2009).

Figure 10: General view of the proposed Site 2 ADP development area

2.2.1) SUMMARY OF THE ADP'S ARCHAEOLOGICAL SCOPING STUDY

The database component of the Archaeological Scoping Study for the ADP development identified a number of historical resources in the town of De Aar. Surveys conducted in 1881 identified the then farm De Aar as a suitable primary junction for interior railways of the Cape Government Railways and the town became the focal point for railway lines running from Cape Town, Port Elizabeth and East London as well as to Namibia following World War I. The house of Olive Schreiner (South African novelist) has been converted into a museum and the town of De Aar is host to a '*Garden of Remembrance*' honouring British troops killed during the Anglo-Boer War. KhoiSan petroglyphs (rock engravings) give evidence of pre-historic occupation within the general area of De Aar, with the closest engraving site to the study area being located on the neighbouring farm Brandfontein, approximately 3km west of the DoD Ammunition Depot and School of Ammunition (Van Ryneveld 2008).

No known archaeological or cultural heritage resources, as defined and protected by the National Heritage Resources Act, Act No 25 of 1999 (NHRA 1999) were identified through the database search to be present on Sinclair's Dam 133 (Van Ryneveld 2008).

In addition to the database search the Archaeological Scoping Study was supplemented by a brief site visit to the study area which resulted in the following preliminary findings (Van Ryneveld 2008):

- Proposed ADP development Sites 1-3:

1. Low densities of Stone Age lithic artefacts were present at the Site 1 (S30°39'04.5"; E23°55'58.3") and Site 2 (S30°38'32.6"; E23°57'18.3") locales. Surface finds were in both cases interpreted as 'low density scatters' rather than archaeological 'sites' and assigned a preliminary SAHRA *Low Significance* and a *Generally Protected C* field rating. Preliminary recommendations included that should either of the sites be identified as the ADP development site archaeological finds be destroyed *in lieu* of the development without the developer having to apply for a SAHRA *Site Destruction Permit*.
2. The proposed Site 3 (S30°39'15.1"; E23°57'45.0") locality was characterized by contemporary DoD infrastructure dating to approximately 30 years ago; thus post-dating 60 years of age and not formally protected under the NHRA 1999. Preliminary recommendations included that development at the site would not impact on any archaeological or cultural heritage resources.

- The Q2 gravel quarry site

The Q2 gravel quarry site (S30°41'52.1"; E23°57'54.0") may be used during the construction phase of the ADP development. No archaeological layers were observed to be present either within or overlying the large exposed quarry sections.

- The known contemporary gravesite

One known contemporary gravesite is located on Sinclair's Dam 133 (S30°38'45.5"; E23°57'55.6"). The site will not be directly impacted on by the proposed ADP development. The site is fenced, with one access gate; complying with SAHRA minimum site conservation standards.

In conclusion the ADP's Scoping Study resulted in the identification of a fatal flaw with Site 2 regarding the position of the ADP in relation to the military airfield. Site 1 and Site 3 were to be investigated in more detail for purposes of the EIA Phase.

2.3) THE IMPACT ASSESSMENT PHASE: PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

2.3.1) ARCHAEOLOGICAL LEGISLATIVE COMPLIANCE

The Phase 1 Archaeological Impact Assessment (AIA) was requested by the South African Heritage Resources Agency (SAHRA) mandatory responsible for the NHRA 1999. The assessment was requested as specialist sub-section to the EIA in compliance with the requirements of the NEMA 1998 and associated regulations (2006) and the NHRA 1999 and associated regulations (2000).

The Phase 1 AIA aimed to locate, identify and assess the significance of cultural heritage resources inclusive of archaeological deposits / sites, built structures older than 60 years, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict and cultural landscapes and viewscapes as defined and protected by the HNRA 1999, that may be affected by the proposed development. Palaeontological deposits / sites as defined and protected by the NHRA1999 are not included as subject to this report.

2.3.2) DEVELOPMENT LOCATION, COVERAGE AND GAP ANALYSIS

The proposed approximate 600m x 600m (36ha) ADP development and associated linear development, as described in sections 1.1.3.1) and 2.2), to be located within a 15m development corridor from existing infrastructure, is to be located at the DoD's Ammunition Depot and School of Ammunition, Sinclair's Dam 133, near the town of De Aar in the Northern Cape Province, South Africa.

Of the original proposed 3 possible APD site localities Site 2 has been eliminated through the Scoping Process based on site proximity to the military airfield. The Phase 1 AIA assessment included proposed ADP development localities Site 1 and Site 3 and associated access roads alongside which linear development will be prioritized.

2.3.3) METHODOLOGY

The Phase 1 AIA was conducted over a one day (2009-02-12) period by one archaeologist. The assessment was done by foot and limited to a Phase 1 survey; no excavation or sub-surface testing was done. Visibility was good, a direct result of relatively poor vegetation cover. Sub-surface interpretations were based on a number of animal burrows present within the study sites and geotechnical test pits. GPS co-ordinates were taken with a Garmin

GPSmap 60CSx GPS (Datum: WGS84). Photographic documentation was done with a Pentax K10D camera. A combination of Garmap and Google Earth software was used in the display of spatial information.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007).

SAHRA ARCHAEOLOGICAL AND CULTURAL HERITAGE SITE SIGNIFICANCE ASSESSMENT			
SITE SIGNIFICANCE	*FIELD RATING*	*GRADE*	*RECOMMENDED MITIGATION*
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	-	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	-	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	-	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Table 1: SAHRA archaeological and cultural heritage site significance assessment and mitigation recommendations

2.3.4) PHASE 1 AIA ASSESSMENT FINDINGS

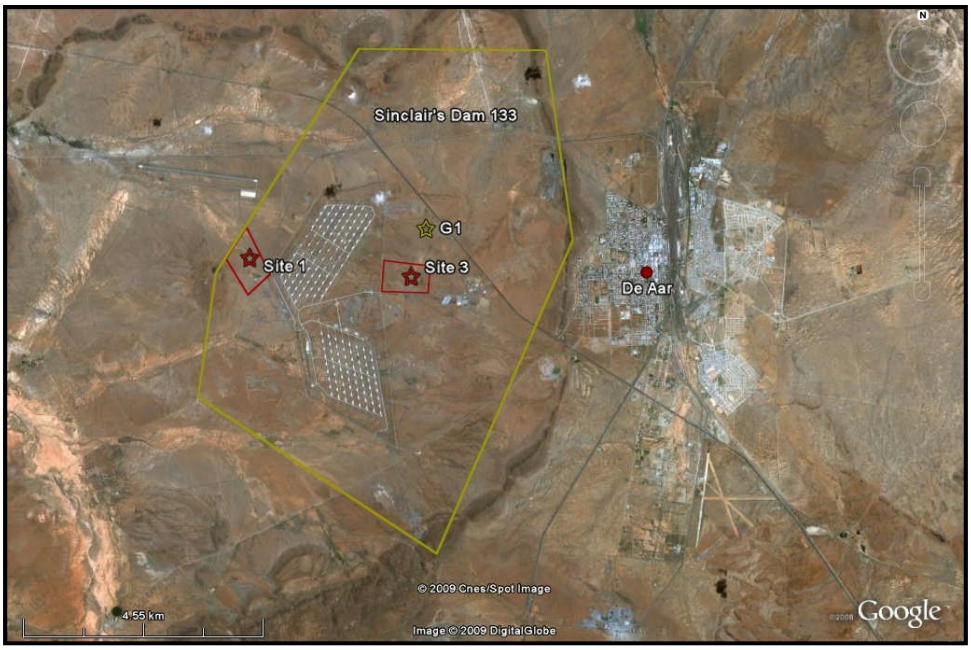


Figure 11: Phase 1 AIA findings

Assessment of the proposed two ADP site localities resulted in the identification of a low density Stone Age artefact scatter, with a possible Fauresmith industrial occurrence at Site 1. Site 3 was primarily characterized by the contemporary disused horse stables development and associated low density surface rubble in the immediate vicinity.

2.3.4.1) PROPOSED ADP SITE 1 – S30°39'04.5"; E23°55'58.3"

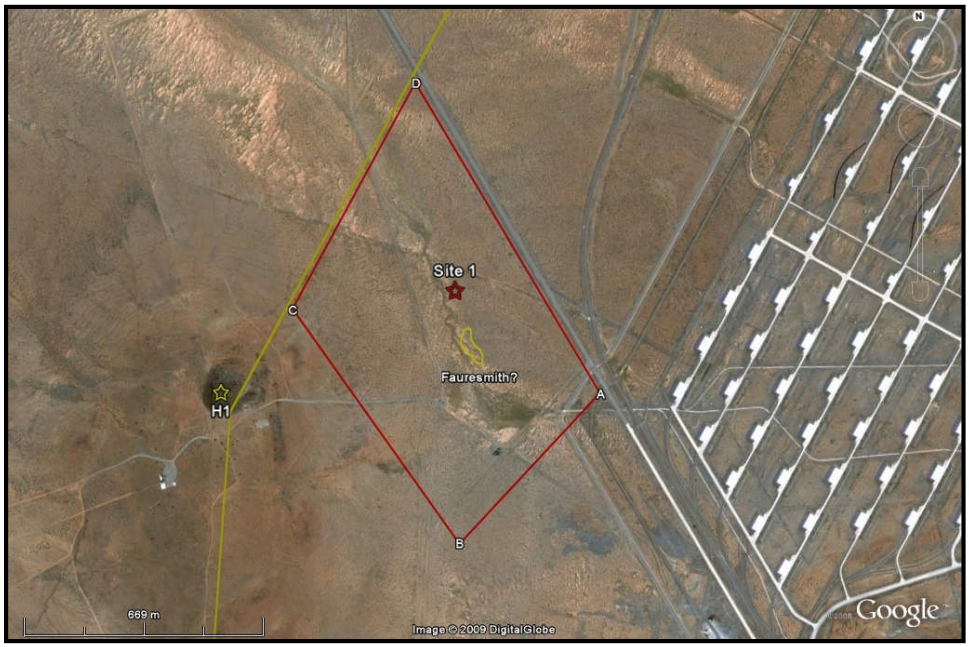


Figure 12: Phase 1 AIA assessment - proposed ADP Site 1

- Phase 1 AIA assessment findings:

The assessed proposed ADP Site 1 locality comprised of an approximate 900m x 600m (54ha) area to accommodate the estimated 36ha development.

The general area is characterized by a relatively low density of Stone Age artefacts with an average artefact ratio (artefacts: m^2) of 1:2.5-4. The low density artefact scatter seemed to be typologically most representative of a later MSA (Middle Stone Age) facies. Towards the central part of the proposed site locality a much denser concentration of artefacts were encountered. The approximate 100m x 30m (0.03ha) area yielded primarily large MSA flakes including a number of blade-like artefacts in association with small handaxes / bifacial tools, more reminiscent of the ESA (Earlier Stone Age), with an estimated artefact ratio of 1:1. The combination of typical MSA flakes and small handaxes may be interpreted as a Fauresmith occurrence, often regarded as the 1st Intermediate or a transitional industry between the ESA and the MSA. A geotechnical test pit located at the occurrence displayed stratigraphically mainly sterile sub-surface sections. The surface occurrence may thus represent an original Fauresmith site or alternatively is the result of a lagged MSA to ESA sequence with the extremely limited *in situ* material, observed in the geotechnical test pitsection, interpreted to comprise of sub-anthropic disturbance only. The absence of a sub-surface *in situ* component to the assemblage radically reduces the significance of the find and potential outcomes of a Phase 2 archaeological mitigation project. The value of the find lies in the combination of surface lithic typology, without the potential of *in situ* testing, but extending the possible southern periphery of the so called 'Fauresmith triangle'. The occurrence will directly be impacted on by development at the ADP Site 1 locality.

Located slightly west of the ADP Site 1 locality is a hill, apparently host to the ruined remains of a stone stock enclosure reported on by members of the DoD. The site was not visited at the time of the assessment due to safety regulations associated with open pit blasting. The relatively 'straight' wall remains is interpreted as belonging to the Historical Period. Despite proximity the site will not be impacted on by development at the ADP Site 1 locality.

- SAHRA Site Significance Assessment:

1. The general low density Stone Age occurrence is assigned a SAHRA *Low Significance* and *Generally Protected C* field rating based on the extremely low density inferred secondary context of artefacts. Low densities of Stone Age artefacts are in addition a feature often reported on in Northern Cape surveys.
2. The Fauresmith occurrence is assigned a SAHRA *Low Significance* and *Generally Protected C* field rating. The assignation is based on the surface restricted extent of the find without the possibility of sub-surface testing, thereby radically reducing the significance of the find, the potential of a clear site identification and associated outcomes of a Phase 2 archaeological mitigation project.
3. The Historical Period stone stock enclosure remains will not be impacted on by development at the Site 1 locality. A SAHRA Site Significance assignation is thus irrelevant.

- Recommendations:

It is recommended that Stone Age occurrences at the ADP Site 1 locality, assigned a SAHRA *Low Significance* and *Generally Protected C* field rating, be destroyed *in lieu* of the development without the developer having to:

1. Apply for a SAHRA *Site Destruction Permit*; or
2. Comply with any further archaeological and cultural heritage legislative compliance requirements prior to development.

Figure 13: General view of the proposed ADP Site 1 (1)

Figure 14: General view of proposed ADP Site 1 (2)

Figure 15: Low density artefacts in the general Site 1 area

Figure 16: View of the Fauresmith like surface scatter

Figure 17: Close up of the Fauresmith scatter

Figure 18: The geotechnical sub-surface section

Figure 19: Artefacts from the Fauresmith surface scatter

Figure 20: Artefacts from the Fauresmith surface scatter

2.3.4.2) PROPOSED ADP SITE 3 – S30°39'15.1"; E23°57'45.0"

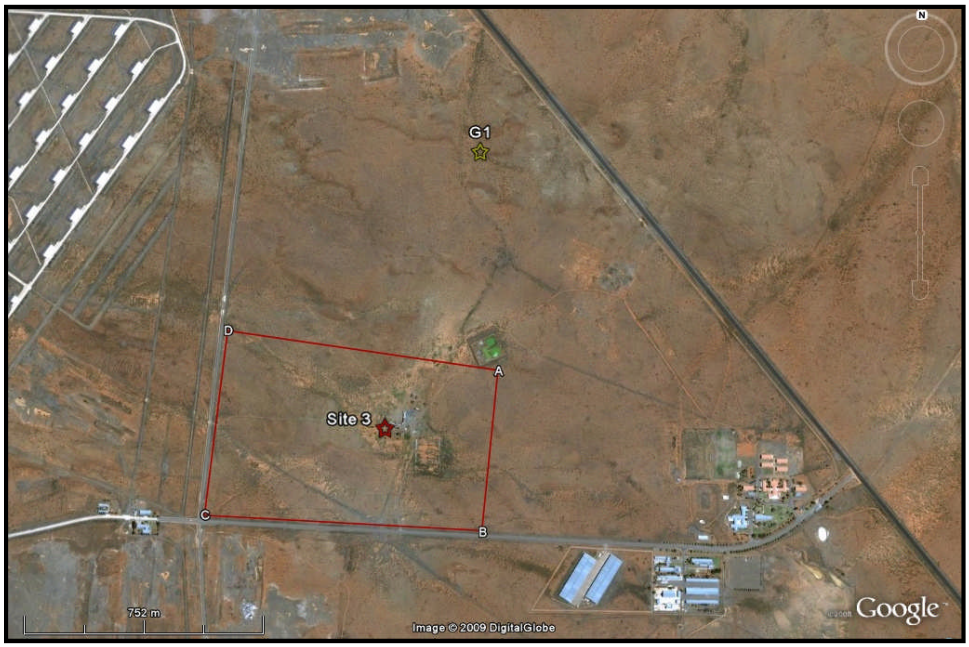


Figure 21: Phase 1AIA assessment – proposed ADP Site 3

- Phase 1 AIA assessment findings:

The assessed proposed ADP Site 3 locality comprised of an approximate 800m x 550m (44ha) area to accommodate the estimated 36ha development.

The site is characterized by the DoD's disused horse stables area, a development dating to approximately 30 years ago and in a steady state of decay. Contemporary artefacts primarily comprising of metal and glass were scattered in the vicinity of the horse stables. The site post-dates 60 years of age and is by implication not protected under the NHRA 1999. Impact on the site is not subject to SAHRA application or approval.

In addition to the low impact contemporary development the general area is typified by an extremely low density of scattered Stone Age artefacts, with an estimated artefact ratio (artefacts: m^2) of ≤1:4-16, where present. Lithics, inferred to be in secondary context, is typologically assigned to the latter part of the MSA / macrolithic LSA (Later Stone Age).

A known contemporary gravesite is located approximately 800m north of the proposed study area (S30°38'23.6"; E23°56'30.6"). The site is currently fenced with one access gate, thus complying with SAHRA Site Conservation standards. The site will not be impacted on should development proceed at Site 3.

- SAHRA Site Significance Assessment:

1. The contemporary horse stables site post dates 60 years of age and is not formally protected under the NHRA 1999. A SAHRA Site Significance rating is thus not applicable.
2. The general low density Stone Age scatter is assigned a SAHRA *Low Significance* and *Generally Protected C* field rating.

- Recommendations:

1. The cotemporary DoD's horse stables development post dates 60 years of age and is by implication not protected under the NHRA 1999. Impact on the site is not subject to SAHRA application or approval.
2. It is recommended that the low density Stone Age artefact scatter at ADP Site 3, assigned a SAHRA *Low Significance* and *Generally Protected C* field rating, be destroyed *in lieu* of the development without the developer having to apply for a SAHRA *Site Destruction Permit*.
3. It is recommended that development at the Site 3 ADP locality proceed without the developer having to comply with any further archaeological or cultural heritage requirements prior to development.

Figure 22: General view of proposed ADP Site 3

Figure 25: Stone Age and contemporary artefacts at proposed ADP Site 3

Figure 23: Existing contemporary infrastructure at ADP Site 3(1)

Figure 26: General view of the gravesite

Figure 24: Existing contemporary infrastructure at ADP Site 3(2)

Figure 27: Graves located within the known gravesite

2.3.4.1) CONSERVATION OF ROCK ENGRAVINGS ON THE PROPERTY BRANDFONTEIN

Concern was raised regarding the possible effect of the proposed ADP development, particularly gaseous emissions, on the known rock engravings located on the farm Brandfontein, which in turn resulted in consultation with Rock Art specialist Shiona Moodley.

SHIONA MOODLEY – NATIONAL MUSEUM, BLOEMFONTEIN
HEAD OF DEPARTMENT - ROCK ART
TEL: 051 447 9609 / E-MAIL: shiona@nasmus.co.za
MA ARCHAEOLOGY, RARI (Rock Art Research Institute), WITS UNIVERSITY

POSSIBLE DAMAGE TO THE BRANDFONTEIN ENGRAVINGS

Rock engravings are made using pecking and abrading techniques that alter the physical nature and appearance of the parent rock. Contrast gained through differences in depth and texture give the engraving a unique appearance.

Brandfontein engraving site is in a stable condition and requires no direct conservation intervention. The arid environment has caused the natural development of a dark shiny patina over the rock surfaces thereby changing the original groove profile. Over many years this will continue in a natural process of weathering, however, this may be accelerated if there is a concentration of unnatural emissions in the environment. Since the Ammunition Disposal Plant will not release any dangerous substances into the atmosphere, the Brandfontein rock engravings require no direct conservation initiatives.

Furthermore, since Brandfontein rock art site is located 3km from the proposed development it is highly unlikely that any drastic damage to the engravings will occur. Given that during the construction of the Ammunition Disposal Plant existing road, railway and electricity sources will be utilized there will be no significant effect to the engravings.

2.3.5) RECOMMENDATIONS

Two site localities (Site 1 and Site 3) have been proposed for the approximate 36ha ADP development to be located at the DoD's Ammunition Depot and School of Ammunition, Sinclair's Dam 133, near the town of De Aar in the Northern Cape. Assessment of Site 1 comprised of an approximate 54ha area and 44ha were assessed at the Site 3 locality to accommodate the proposed ADP and associated linear development.

- SITE 1 - Recommendations:

The Site 1 (S30°39'04.5"; E23°55'58.3") study area is characterized by a low density Middle Stone Age artefact scatter with an area located relatively centrally within the study site displaying a surface restricted collection of possible Fauresmith age. The absence of a sub-surface component to the find does not warrant Phase 2 Archaeological Mitigation. Stone Age occurrences in the area is ascribed a SAHRA *Low Significance* and a *Generally Protected C* Field Rating. It is recommended that development at the Site 1 locality proceed without the developer having to:

1. Apply for a SAHRA *Site Destruction Permit*; or
2. Comply with any further archaeological and cultural heritage legislative compliance requirements prior to development.

- SITE 3 - Recommendations:

The Site 3 (S30°39'15.1"; E23°57'45.0") area is characterized by the disused DoD's horse stables. The site dates to approximately 30 years ago, by implication not formally protected under the NHRA 1999. Development impact on the horse stables site is not subject to SAHRA application or approval. A low density of Stone Age artefacts was discovered on the surface of the study site. The Stone Age occurrence was ascribed a SAHRA Low Significance and a Generally Protected C field rating. I is recommended that development at Site 3 proceed without the developer having to:

1. Apply for a SAHRA *Site Destruction Permit*; or
2. Comply with any further archaeological and cultural heritage legislative compliance requirements prior to development.

(A known contemporary gravesite is located approximately 800m north of Site 3. The gravesite is fenced according to SAHRA conservation standards and will not be impacted on by the development).

Development at neither of the proposed ADP development sites (Site 1 or Site 3) will impact negatively on any significant archaeological or cultural heritage resources as defined and protected by the NHRA 1999.

MAP CODE	*SITE*	*TYPE / PERIOD*	*DESCRIPTION*	*CO-ORDINATES*	*PRELIMINARY RECOMMENDATIONS*
PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT: ESTABLISHMENT OF AN AMMUNITION DISPOSAL PLANT, SINCLAIR'S DAM 133, DE AAR, NORTHERN CAPE					
SINCLAIR'S DAM 133					
Site 1	ADP Site 1	Stone Age	Low density occurrence	S30°39'04.5"; E23°55'58.3"	***Destruction*** (Without SAHRA Site Destruction Permit)
F1	Fauresmith?	Stone Age	Surface occurrence	S30°39'09.0"; E23°55'50.1"	***Destruction*** (Without SAHRA Site Destruction Permit)
A	-	-	-	S30°39'13.9"; E23°56'03.7"	***N/A***
B	-	-	-	S30°39'26.6"; E23°55'47.9"	***N/A***
C	-	-	-	S30°39'04.5"; E23°55'31.9"	***N/A***
D	-	-	-	S30°38'44.7"; E23°55'46.5"	***N/A***
Site 3	ADP Site 3	Stone Age	Low density occurrence	S30°39'15.1"; E23°57'04.5"	***Destruction*** (Without SAHRA Site Destruction Permit
A	-	-	-	S30°39'08.9"; E23°57'58.6"	***N/A***
B	-	-	-	S30°39'25.5"; E23°57'57.1"	***N/A***
C	-	-	-	S30°39'24.5"; E23°57'23.9"	***N/A***
D	-	-	-	S30°39'05.4"; E23°57'25.5"	***N/A***

Table 2: Archaeological scoping assessment co-ordinates

2) REFERENCES CITED

Emthanjeni Integrated Development Plan (IDP), 2008/2009.

South African Government. (No. 84) of 1982. Protection of Information Act.

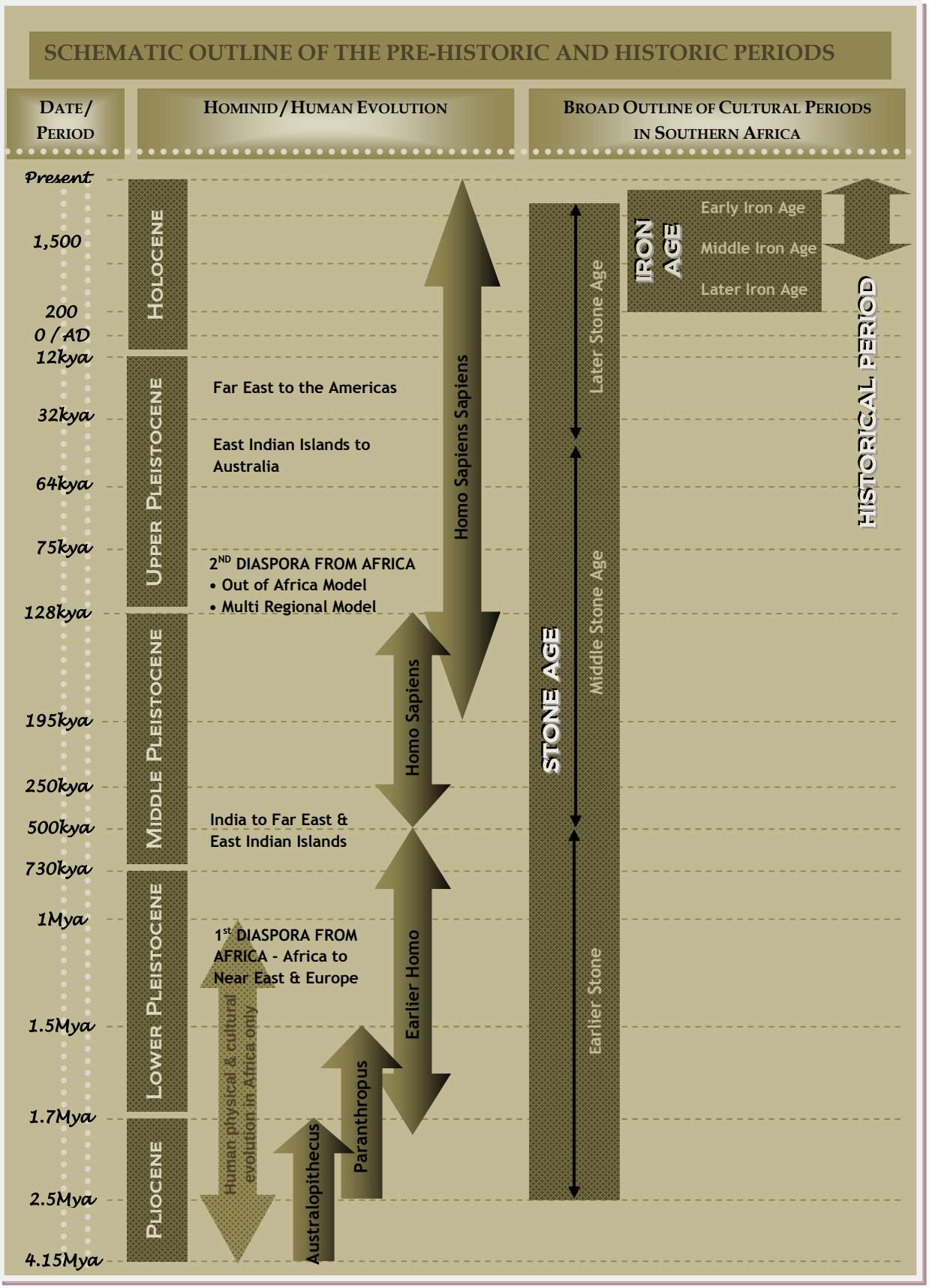
South African Government. (No. 107) of 1998. National Environmental Management Act.

South African Government. (No. 25) of 1999. National Heritage Resource Act.

South African Heritage Resources Agency. 2007. Minimum standards for the archaeological and heritage components of impact assessments. Unpublished guidelines.

Teurlings, P. & Behrens, L. (BKS) 2008. Final Environmental Scoping Report and Plan of Study for EIA for the Proposed Ammunition Demilitarization Plant at the Department of Defence Ammunition Depot and School of Ammunition, De Aar (DEAT Ref. No 12/12/20/1307). Unpublished report.

Van Ryneveld, K. 2008. Archaeological Scoping Study – Establishment of an ammunition disposal plant, Sinclair's Dam 133, De Aar, Northern Cape, South Africa. Unpublished report.


SCHEMATIC OUTLINE OF THE PRE-HISTORIC AND HISTORIC PERIODS
DATE / PERIOD
HOMINID / HUMAN EVOLUTION
BROAD OUTLINE OF CULTURAL PERIODS IN SOUTHERN AFRICA
Present
1,500
200
0 / AD
12kya
32kya
64kya
75kya
128kya
195kya
250kya
500kya
730kya
1Mya
1.5Mya
1.7Mya
2.5Mya
4.15Mya
HOLOCENE
UPPER PLEISTOCENE
MIDDLE PLEISTOCENE
LOWER PLEISTOCENE
PLIOCENE
Far East to the Americas
East Indian Islands to Australia
2ND DIASPORA FROM AFRICA
• Out of Africa Model
• Multi Regional Model
India to Far East & East Indian Islands
1st DIASPORA FROM AFRICA - Africa to Near East & Europe
Human physical & cultural evolution in Africa only
Homo Sapiens Sapiens
Homo Sapiens
Earlier Homo
Paranthropus
Australopithecus
STONE AGE
Later Stone Age
Middle Stone Age
Earlier Stone
IRON AGE
Early Iron Age
Middle Iron Age
Later Iron Age
HISTORICAL PERIOD

EXTRACTS FROM THE

NATIONAL HERITAGE RESOURCES ACT (NO 25 OF 1999)

DEFINITIONS

SECTION 2

In this Act, unless the context requires otherwise:

ii. "*Archaeological*" means –
   a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
   b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
   c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic,… and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.

viii. "*Development*" means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
   a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
   b) carrying out any works on or over or under a place;
   c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
   d) constructing or putting up for display signs or hoardings;
   e) any change to the natural or existing condition or topography of land; and
   f) any removal or destruction of trees, or removal of vegetation or topsoil;

xiii. "*Grave*" means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

xxi. "*Living heritage*" means the intangible aspects of inherited culture, and may include –
   a) cultural tradition;
   b) oral history;
   c) performance;
   d) ritual;
   e) popular memory;
   f) skills and techniques;
   g) indigenous knowledge systems; and
   h) the holistic approach to nature, society and social relationships.

xxxi. "*Palaeontological*" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance;

xli. "*Site*" means any area of land, including land covered by water, and including any structures or objects thereon;

xliv. "*Structure*" means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

NATIONAL ESTATE

SECTION 3

1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
2) Without limiting the generality of subsection 1), the national estate may include –
   a) places, buildings, structures and equipment of cultural significance;
   b) places to which oral traditions are attached or which are associated with living heritage;
   c) historical settlements and townscapes;
   d) landscapes and natural features of cultural significance;
   e) geological sites of scientific or cultural importance
   f) archaeological and palaeontological sites;
   g) graves and burial grounds, including –
      i. ancestral graves;
      ii. royal graves and graves of traditional leaders;
      iii. graves of victims of conflict
      iv. graves of individuals designated by the Minister by notice in the Gazette;
      v. historical graves and cemeteries; and
      vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)

h) sites of significance relating to the history of slavery in South Africa;
i) movable objects, including –
   i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
   ii. objects to which oral traditions are attached or which are associated with living heritage;
   iii. ethnographic art and objects;
   iv. military objects;
   v. objects of decorative or fine art;
   vi. objects of scientific or technological interest; and
   vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

STRUCTURES

SECTION 34

1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

ARCHAEOLOGY, PALAEONTOLOGY AND METEORITES

SECTION 35

3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
4) No person may, without a permit issued by the responsible heritage resources authority –
   a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
   b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
   c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
   d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
   a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
   b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
   c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
   d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

BURIAL GROUNDS AND GRAVES

SECTION 36

3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority –
   a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
   b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
   c) bring onto or use at a burial ground or grave referred to in paragraph a) or b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory

arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
    a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
    b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
    a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
    b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-internment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

HERITAGE RESOURCES MANAGEMENT

SECTION 38

1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised as –
    a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
    b) the construction of a bridge or similar structure exceeding 50 m in length;
    c) any development or other activity which will change the character of a site –
        i. exceeding 5 000 m² in extent; or
        ii. involving three or more existing erven or subdivisions thereof; or
        iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
        iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
    d) the rezoning of a site exceeding 10 000 m² in extent; or
    e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

    must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.
2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
    a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
    b) notify the person concerned that this section does not apply.
3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) …
4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
    a) whether or not the development may proceed;
    b) any limitations or conditions to be applied to the development;
    c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
    d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
    e) whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS

SECTION 50

7) Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
8) A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
9) Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
    a) enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
    b) confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
    c) take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.
10) A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.

HERITAGE / ARCHAEOLOGICAL SPECIALIST ASSESSMENT REPORT FOR THE PROPOSED AMMUNITION DEMILITARIZATION PLANT AT THE DEPARTMENT OF DEFENCE AMMUNITION DEPOT AND SCHOOL OF AMMUNITION, DE AAR

Declaration of independence of the sub-consultant as required by NEMA Regulation 33(2) of GN 385:

1. Compliance with NEMA Regulation 33(2) of GN 385:

(a) details of –

(i) the person who prepared the report; and

Name: Karen van Ryneveld

ID: 721110 0183 082

Company Name: ArchaeoMaps

Postal address: P.O. Box 28530, Danhof, 9310

Tel: 051 446 0148 / 084 871 1064

Fax: N/A

Email: kvanryneveld@gmail.com / ArchaeoMaps.karen@iburst.co.za

Website: N/A

(ii) the expertise of that person to carry out the specialist study or specialized process;

1. **MSc – Archaeology (WITS University - 2003)**
2. **[ASAPA (Association of Southern African Professional Archaeologists) CRM (Cultural Resources Management) accreditation: Field Director – Stone Age, Iron Age & Colonial Period (2005)]**

Have conducted specialist studies for:

2009/02 **van Ryneveld, K. & Steyn, B.**

- **Phase 2 Archaeological Mitigation – Stone Age deposits at Sites L2/M1.04 and L2/M1.08, L2/M1 mining area, Klipfontein 99, Francis Baard District, Northern Cape, South Africa (De Beers Consolidated Mines)**

2009/01 **van Ryneveld, K.**

- **Phase 2 Archaeological Mitigation – Middle Stone Age sequences at excavations DKE8 and DKE13, Diamond Koppie, Vogelstruispan 101, Francis Baard District, Northern Cape, South Africa (De Beers Consolidated Mines)**

2008/12 **van Ryneveld, K.**

- **Letter of Recommendation – Exemption from a Phase 1 Archaeological Impact Assessment (AIA) for the beachfront adjoining the Cove Rock Golf Estate and the Hotel and Conference Centre Development, Cove Rock, East London, Eastern Cape, South Africa (BESC)**

2008/12 van Ryneveld, K.

- Letter of Recommendation – Exemption from a Phase 1 Heritage Impact Assessment (HIA) for the Salt River Resources Prospecting Program (Portions of the Farm Adjoining Geelvloer, Remainder & Portion 1 of the Farm Graafwater, Gannapoort, Lovedale, Quagga Maag, Hartbeestvlei and Vaal Kop) Kenhardt District, Northern Cape, South Africa (Salt River Resources)

2008/12 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Kidd's Beach Golfing Estate, Portions of Farms 1075, 1076, 1077, 1078, 1079 & 1086, Kidd's Beach, East London, Eastern Cape, South Africa (BESC)

2008/11 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Residential development, Matola private game reserve, Portion 2 of Farm 36, Komga, Eastern Cape, South Africa (Merryweather Environmental)

2008/11 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Rezoning and subdivision for purposes of mixed use development, Farm RE/961, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/11 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Warehousing and light industrial development, Farm 922, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/11 van Ryneveld, K.

- Archaeological & Cultural Heritage Site Management - Boomplaats 21, the Schmidtsdrift alluvial diamond mining area, Schmidtsdrift, Northern Cape, South Africa (TM Squared Project Managers)

2008/11 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Extension to Refengkgotso Township, Portions 3 & 5 of Mooiplaats 581, Deneysville, Fezile Dabi District, Free State, South Africa (NSVT Consultants for Y.B. Mashalaba & Associates Consultants)

2008/10 van Ryneveld, K.

- Archaeological Scoping Study – Establishment of an ammunition disposal plant, Sinclair's Dam 133, De Aar, Northern Cape, South Africa (BKS – Engineering and Management)

2008/10 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Utilization of 17 existing quarries for upgrading of the DR2629, Road nr 654 and the DR2631, Middelburg area, Eastern Cape, South Africa (Kwezi V3 Engineers)

2008/10 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Rezoning and mixed use development, Portion 4 of Farm 1050, East London, Eastern Cape, South Africa (BESC)

2008/09 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Residential development, Portions 3, 4 & 18 of Farm 807, Quenera, East London, Eastern Cape, South Africa (BESC)

2008/09 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Rezoning and subdivision for mixed use development, Farm 939, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/08 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Warehousing and related infrastructure, Portion 19 of Farm 925, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/08 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Proposed pipeline, Portion of Farm 1008, Winterstrand, East London, Eastern Cape, South Africa (BESC)

2008/07 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Riverleigh township development, Farm 817/53, East London, Eastern Cape, South Africa (BESC)

2008/07 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Industrial development, Erven 17532 & 49336, Orange Grove, East London, Eastern Cape, South Africa (BESC)

2008/07 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Diamond mining, Portions of Erven 1 & 341, Douglas, Northern Cape, South Africa (Giet and Mieta Mining & EDM Family Trust)

2008/07 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Development of a shopping mall & commercial offices, Portions 21, 22 & 23 of Farm 925, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/06 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Retail and residential development, Portions 3 & 5 of Farm 1234, Gonubie, East London, Eastern Cape, South Africa (BESC)

2008/06 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Hotel and conference centre development, Portion 2 of Farm 992, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/05 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Cove Rock Golf Estate, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/05 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Proposed construction of commercial offices and retail space, Erf 9582, Sweetwaters, King Williams Town, Eastern Cape, South Africa (BESC)

2008/05 van Ryneveld, K.

- Phase 1 Archaeological Impact Assessment – Residential development, Portions 1 & 4 of Farm 1245, Cove Rock, East London, Eastern Cape, South Africa (BESC)

2008/05 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Residential development, Farm 960, East London, Eastern Cape, South Africa (BESC)**

2008/03 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – The Albany Regional Water Supply Scheme, Eastern Cape, South Africa (BESC)**

2008/01 **van Ryneveld, K.**

- **Addendum to the Phase 1 Archaeological Impact Assessment – Phase 1 Archaeological Impact Assessment – Extension to Mahlatswetsa Township, Excelsior, Free State, South Africa (Phethogo Consulting)**

2008/01 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – The De Witteberg Mountain Resort Development, Portion 4 of the farm Jacobz-Berg 150, Rosendal, Ficksburg District, Free State, South Africa (EIMS)**

2007/12 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Mnt. Coke Eco-Residential and Golf Estate, East-London, Eastern Cape, South Africa (BESC)**

2007/12 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment for a 1.1ha Mining development to be located on a Portion of Erf 1, Douglas, Northern Cape, South Africa (Jan Minnie)**

2007/12 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – A 1.1ha Mining Development, Portion of Erf 1, Douglas, Northern Cape, South Africa (Valentine J. Julius)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Tumahole Ext 7 Residential Development, Parys, Free State, South Africa (Emendo Africa)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Extension 9 of the Manyatseng Township, Ladybrand, Free State, South Africa (Phethogo Consulting)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Extension to Mahlatswetsa Township, Excelsior, Free State, South Africa (Phethogo Consulting)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Thornhill Phase 2 Ministerial Housing Project, Port Alfred, Eastern Cape, South Africa (BESC)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Thornhill Phase 1 Ministerial Housing Project, Port Alfred, Eastern Cape, South Africa (BESC)**

2007/11 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Upgrade of the Waste Water Treatment Works, Port Alfred, Eastern Cape, South Africa (BESC)**

2007/10 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Upgrade of the Sewer Purification Plant, Springfontein, Free State, South Africa (NSVT Consultants)**

2007/10 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Upgrade of the Sewer Purification Plant, Reddersburg, Free State, South Africa (NSVT Consultants)**

2007/10 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Mooidraai Township Establishment (Zamdela Ext 17), Portions of Portion 1 and the Remainder of the Farm Mooidraai 44, Sasolburg, Free State, South Africa (YB Mashalaba & Associates)**

2007/10 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – The Hopewell Conservation Project, Greenbushes, Port Elizabeth, Eastern Cape, South Africa (SRK Consulting)**

2007/10 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – The New Provincial Offices, Portion of Erf 15735, Bloemfontein, Free State, South Africa (Wellcorp Pty Ltd)**

2007/09 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Realignment of the 6th Fairway, East London Golf Club, East London, Eastern Cape, South Africa (BESC)**

2007/08 **van Ryneveld, K.**

- **Proposed Phase 2 Archaeological Mitigation and Management for the Residential Development Remainder of Portion 1 of the Farm Van Zoelen's Laagte 158, Windsorton, Barkly-West District, Northern Cape (MLM van der Molen Environmental Consultancy)**

2007/07 **Biemond, W.M. & van Ryneveld, K.**

- **Archaeological Impact Assessment – The Kudumatse Groundwater Exploration Project, development Bock 1 and Alternative Development Block 4, Central District, Botswana (Digby Wells & Associates for CIC Energy Corporation)**

2007/06 **van Ryneveld, K.**

- **Archaeological Site Inspection – Mining Impact on two graveyard sites, Smitsdrift Mining Area, Boomplaats 21, Schmidtsdrift District, Northern Cape, South Africa (Nare Diamonds Ltd)**

2007/05 **Biemond, W.M. & van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – The Mmamabula Energy Project: Proposed Strip Mining Development, Central District, Botswana (Digby Wells & Associates for CIC Energy Corporation)**

2007/04 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Phase 1 Intabazwe Residential Development, Harrismith, Free State, South Africa (Seaton, Thomson & Associates for Emendo Africa)**

2007/04 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Sewer Purification Plant, Ikutseng Township, Warrenton, Northern Cape, South Africa (Tswelopele Environmental Ltd)**

2007/03 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Portion of the Farm Boksputs 118, Groblershop District, Northern Cape, South Africa (Amber Mountain Investments)**

2007/03 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Portion of the Farm Cnydas East 439, Upington District, Northern Cape, South Africa (Amber Mountain Investments)**

2007/02 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Upgrading of the Waste Water Treatment Works, Wepener, Free State, South Africa (NSVT Consultants for Phethogo Consulting)**

2007/02 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Baken Park Ext 5, 6 & 7 Residential Development, Portion of the Farm Vogelfontein 69, Bethlehem, Free State, South Africa (Seaton, Thomson & Associates for Emendo Africa)**

2007/02 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Cradock Weir Residential Development, Portion of Erf 1, Cradock, Eastern Cape, South Africa (JSP2 Developments)**

2007/01 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Portion of the Farm Platfontein 68, Kimberley District, Northern Cape, South Africa (De Beers Consolidated Mines)**

2006/12 **van Ryneveld, K., van der Walt, J. & Walker, N. J.**

- **The Mmamabula Energy Project. Phase 1 Archaeological Impact Assessment – Portion of the Mine and Power Station Development Area, Botswana (Interim Report ii) (Digby Wells & Associates for CIC Energy Corporation)**

2006/12 **van Ryneveld, K., van der Walt, J. & Walker, N. J.**

- **The Mmamabula Energy Project. Phase 1 Archaeological Impact Assessment – The 25km 'South' Transmission Line, Botswana (Digby Wells & Associates for CIC Energy Corporation)**

2006/12 **van Ryneveld, K., van der Walt, J & Walker, N.J.**

- **The Mmamabula Energy Project. The Ethno-archaeology of Mmapashalala (Digby Wells & Associates for CIC Energy Corporation)**

2006/11 **Cowling, S., Cowling R., Binneman, J.B., Logie, B., Moodley, S., Henderson, Z.L. & van Ryneveld, K.**

- **The Baviaanskloof Mega Reserve: Cultural Heritage Impact Assessment and Cultural Heritage Management Plan (SAN Parks & The Department of Nature Conservation)**

2006/10 **van Ryneveld, K.**

- **The Mmamabula Energy Project. Archaeological Significance Assessment – Mine and Power Station Project Area, and Archaeological Impact Assessment – Power Station and Wash Plant Site, Portion of the Mine and Power Station Project Area, Botswana (Digby Wells & Associates for CIC Energy Corporation)**

2006/10 **van Ryneveld, K.**

- **The Mmamabula Energy Project. Archaeological Impact Assessment – Portion of Phase 1 of the Proposed Transmission Line from Mmamabula to Phokoje and Mmamabula to Jwaneng, Botswana (Digby Wells & Associates for CIC Energy Corporation)**

2006/10 **van Ryneveld, K., Koortzen, C. & Kriek, J.**

- **Phase 1 Archaeological Impact Assessment – Portion of Mooipan 625, Memel, Phumelela District, Free State, South Africa (Bokamoso Consultants)**

2006/08 **van Ryneveld, K. & Koortzen, C**

- **Archaeological Site Inspection – Borrow Pit 76.0 quarry impact on archaeological 'Michausdal' deposits, Cradock District, Eastern Cape, South Africa (SNA/HHO/ICE Joint Venture for SANRAL)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Portions of Kleinkloof) Portion 1 of Kloof 143, Hay District, Northern Cape, South Africa (P.J. Smit)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Portions of) Portion 2 of Kloof 143, Hay District, Northern Cape, South Africa (P.J. Smit & M.H.P. Smit)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Skurwepunt Portion of) Kafir Krans 379, Hay District, Northern Cape, South Africa' (Dawie Beukes)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Nooitverwagt Portion of) Kafir Krans 379, Hay District, Northern Cape, South Africa (P.J. Smit, Jr & P.J. Smit)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Portion of) Farm No 367, Hay District, Northern Cape, South Africa (Salmon J. Beukes)**

2006/08 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – (Portion of) Portion 1, Kalkfontein No 374, Hay District, Northern Cape, South Africa (Salmon J. Beukes)**

2006/07 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Portion of Erf 1, Cradock, Cradock District, Eastern Cape, South Africa (Crabou Eiendomme)**

2006/06 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – John's Uitval No 479, Clocolan District, Free State, South Africa (Mpetsane Conservation Estate)**

2006/06 **van Ryneveld, K.**

- **Phase 1 Archaeological Impact Assessment – Vogelstruis Bult 104, Prieska District, Northern Cape, South Africa (Amber Mountain Investments)**

2006/06 **van Ryneveld, K.**

- **Cultural Heritage Site Inspection Report for the purpose of a Prospecting Right EMP – Doonies Pan 106, Kenhardt District, Northern Cape, South Africa (Amber Mountain Investments)**

2006/06 **van Ryneveld, K.**

- **Cultural Heritage Site Inspection Report for the purpose of a Prospecting Right EMP – Merries Pan 107, Kenhardt District, Northern Cape, South Africa (Amber Mountain Investments)**

2006/06 **van Ryneveld, K.**

- **Archaeological Impact Assessment: Stamper Claim on a portion of the farm Longlands, Barkley-West District, Northern Cape, South Africa (Willie Stamper)**

2006/04 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: A 400 ha Portion of Van Zoelen's Laagte 158, Windsorton District, Northern Cape, South Africa (Free State Diamond Mines)**

2006/03 **van Ryneveld, K.**

- **Archaeological Impact Assessment: Erf 49, Erf 687 and commonage Erf 687, Barkly-West District, Northern Cape, South Africa (Ekolone Small Mining)**

2005/12 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: Portion 1 of Roode Pan 146, Kimberley District, Northern Cape, South Africa (Kimberley West Diamond Mining Company)**

2005/12 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: Rooipoort: (Portions of) Klipfontein 99, Berg Plaats 100, Vogelstruis Pan 98, Vogelstruis Pan 101 and Zand Plaats 102, Kimberley District, Northern Cape, South Africa (De Beers Consolidated Mines)**

2005/12 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: Erf 1, Vaalharts Nedersetting B, Barkly-West District, Northern Cape, South Africa (Jestvet 1290)**

2005/10 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portion of) Areachap 462; Upington District, Northern Cape, South Africa (Amber Mountain Investments)**

2005/10 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portions of) Ettrick 182; Hopetown District, Northern Cape, South Africa (Basadi Ba Tlou & Diamroq)**

2005/09 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portion of) Van Zoelen's Laagte 158, Windsorton District, Northern Cape, South Africa (Evening Star Trading & Free State Diamond Mines)**

2005/09 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portions of) Leeuw Poort 161, Kimberley District, Northern Cape, South Africa (Bonami Mining)**

2005/08 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portions of) Paardeberg 154, Kimberley District, Northern Cape, South Africa (Bonami Mining)**

2005/06 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portion of) Paardeberg 12; Paardeberg-East 153, Kimberley District, Northern Cape, South Africa (Digby Wells & Associates for Diamond Core Resources)**

2005/06 **van Ryneveld, K.**

- **Cultural Resources Management Impact Assessment: (Portion of) Uitdraai 33, Prieska District, Northern Cape, South Africa (Digby Wells & Associates for Diamond Core Resources)**

2005/06 **van Ryneveld, K.**

- **Cultural Heritage Site Inspection Report for the purpose of a Prospecting Right EMP – (Portion of) De Kalk 37, Herbert District, Northern Cape, South Africa (Digby Wells & Associates for Diamond Core Resources)**

2005/06 **van Ryneveld, K.**

- **Cultural Heritage Site Inspection Report for the purpose of a Prospecting Right EMP – (Portion of) Skeyfontein 536, Postmasburg District, Northern Cape, South Africa (Digby Wells & Associates for Diamond Core Resources)**

2005/05 **van Ryneveld, K.**

- **Cultural Heritage Impact Assessment: (Southern portion of) Camp 3, Erf 1, Windsorton, Barkley-West District, Northern Cape (Vernon Diamonds)**

2005/05 **van Ryneveld, K.**

- **Cultural Heritage Impact Assessment: Vergenoecht (portion of) Witpan 13, Warrenton District, Northern Cape, South Africa (Vernon Diamonds)**

2005/04 **van Ryneveld, K.**

- **Cultural Heritage Impact Assessment: (Portion of) Bellsbank Farm 85, Barkley-West District, Northern Cape, South Africa (Free State Diamond Mines)**

2005/04 **van Ryneveld, K. 2005.**

- **Cultural Heritage Impact Assessment: Erf 1, Douglas, Herbert District, Northern Cape, South Africa (Denzil H. Jants)**

2004/09	**van Ryneveld, K**
	• **KwaNibela Community Development Project, Hluhluwe, Northern KwaZulu-Natal (AMAFA Council)**
2004/09	**van Ryneveld, K**
	• **Site Inspection: Palaeontological Deposits at the Hellsgate Military Training Centre, St. Lucia, Northern KwaZulu-Natal (South African National Defence Force)**
2004/08	**van Ryneveld, K**
	• **Report: Archaeological Site Inspection – Waayplaats & Strydpoort, Winterton, KwaZulu-Natal (Irwin Driemeyer)**
2004/08	**van Ryneveld, K**
	• **Report: Archaeological Site Inspection – Cato Crescent, Amanzimtoti, KwaZulu-Natal (Anthony Whatmore & Company: Attorneys & Conveyances)**
2004/05	**van Ryneveld, K**
	• **Cultural Heritage Assessment of Proposed Dam on the Farm Beacon Banks, Lowlands, Estcourt, Kwa-Zulu-Natal (Alan Dowie)**
2004/05	**van Ryneveld, K**
	• **Report: Damage to Border Cave deposits, KwaZulu-Natal (AMAFA Council)**
2004/03	**van Ryneveld, K**
	• **Two Historical Graves, Content Station, Warrenton District, Northern Cape (Transtel)**
2004/01	**van Ryneveld, K & Timothy, A**
	• **Rehabilitation of Grave Sites, Mining Zones 1 & 3, Boomplaats, Schmidtsdrift District, Northern Cape (New Diamond Corporation Ltd)**
2003/10	**van Ryneveld, K & Timothy, A**
	• **Assessment of Grave Site, Mining Zone 1, Boomplaats, Schmidtsdrift district, Northern Cape (New Diamond Corporation Ltd)**
2003/09	**van Ryneveld, K & Morris, D**
	• **Phase 1 Archaeological Impact Assessment at Du Toitspan 119 & Speculatie 217, Northern Cape (De Beers Consolidated Mines)**
2003/08	**van Ryneveld, K & Morris, D**
	• **Diamond Kopje: Surface and Sub-surface Reconnaissance (De Beers Consolidated Mines)**
2003/07	**van Ryneveld, K & Morris, D**
	• **Archaeological Salvage Work at Diamond Kopje, Vogelstruis Pan, Rooipoort – Second Interim Report (De Beers Consolidated Mines)**
2003/06	**van Ryneveld, K & Morris, D**
	• **Archaeological Salvage Work at Diamond Kopje, Vogelstruis Pan, Rooipoort – First Interim Report (De Beers Consolidated Mines)**
2003/01	**Morris, D & van Ryneveld, K**
	• **Report on an Archaeological Assessment of Possible Impacts of Agricultural Development at Riemvasmaak (Riemvasmaak community)**

(b) a declaration that the person is independent in a form as may be specified by the competent authority;

The declaration of independence:

I, **Karen van Ryneveld, ArchaeoMaps,** declare that I:

- Act as the independent heritage / archaeological specialist in this application;
- Do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the National Environmental Management Act, Regulations, 2006;
- Have and will not have no vested interest in the proposed activity proceeding;
- Have no, and will not engage in, conflicting interests in the undertaking of the activity;
- Undertake to disclose, to the Authorities, any material information that have or may have the potential to influence its decision or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, Regulations, 2006.

(c) an indication of the scope of, and the purpose for which the report was prepared:

The Department of Defence (DOD) has requested Sanabo Demil (Pty) Ltd (SANABO) to develop and operate a national Ammunition Demilitarization Plant (ADP) in South Africa in order to destroy obsolete ammunition that is currently in stock. The National Department of Environmental Affairs and Tourism (DEAT) have indicated that a Scoping and Environmental Impact Assessment (EIA) would need to be conducted in order to obtain an environmental authorization for the ADP. This heritage / archaeological specialist assessment is in part fulfillment of the requirements of the EIA being conducted in order to obtain environmental approval for the proposed ADP.

(d) a description of the methodology adopted in preparing the report or carrying out the specialized process;

1. Phase 1 surface field inspection of the proposed development sites and related development areas (including GPS and photographic documentation).

2. Cognizance of heritage resources located in the vicinity as identified during the scoping study.

3. Assessment of findings according to the SAHRA (South African Heritage Resources Agency) Site Significance Assessment criteria.

(e) a description of any assumptions made and any uncertainties or gaps in knowledge;

1. Assumption of sub-surface components to archaeological occurrences based on previous archaeological excavation experience and inspection of on-site geotechnical test pits.

(f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;

1. SITE 1 – Low density archaeological Stone Age lithic scatter of possible Fauresmith Industrial Complex assigned a SAHRA *Low Significance* and *Generally Protected C* field rating.

Recommendation: Site (surface artefact scatter) destruction without the developer having to apply for a SAHRA Site Destruction Permit.

2. SITE 3 – Low density archaeological Stone Age lithic scatter (in inferred disturbed context) assigned a SAHRA *Low Significance* and *Generally Protected C* field rating.

Recommendation: Site (disturbed occurrence) destruction without the developer having to apply for a SAHRA Site Destruction Permit.

3. RELATED LINEAR DEVELOPMENT – Will be concentrated along existing line routes or within assessed areas - no expected impact on heritage / archaeological resources.

(g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;

1. Recommended that development proceed at either Site 1 or Site 3 without the developer having to comply with further heritage / archaeological mitigation requirements.

2. Recommendation is subject to SAHRA approval (SAHRA Archaeological Impact Assessment Review Comment) on the Phase 1 Archaeological Impact Assessment (AIA) report.

(h) a description of any consultation process that was undertaken during the course of carrying out the study;

1. Shiona Moodley (Rock Art Specialist): National Museum Bloemfontein, Head of Department – Rock Art

(i) a summary and copies of any comments that were received during any consultation process; and

The proposed ADP development will not impact negatively on rock engravings located on the neighboring farm Brandfontein (included in Phase 1 AIA report.)

(j) any other information requested by the competent authority.

(N/A)

Signature of the specialist:

2009-03-23

Date: