UPGRADING OF THE 66KV NETWORK TO A 132KV NETWORK IN THE HOTAZEL, KURUMAN AND KATHU AREA, NORTHERN CAPE PROVINCE – POST AUTHERISATION WALKDOWN FROM MOTHIBISTAD SUBSTATION TO SEKGAME SWITCHING STATION.

Heritage Walk Down and Management Plan

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Client:	Zitholele Consulting (Pty) Ltd
Project Number:	208HIA

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Declaration of Independence

This report has been compiled by PGS Heritage, an appointed Heritage Specialist for Zitholele Consulting (Pty) Ltd. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in the development of the Heritage Management Plan.

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ACKNOWLEDGEMENT OF RECEIPT

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Report Title	Heritage Management Plan upgrading of the 66KV network to a 132KV network in the Hotazel, Kuruman and Kathu area, Northern Cape Province – post authorisation walkdown from Mothibistad substation to Sekgame switching station.		
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Review 1	**Mathys Vosloo**		**Zitholele Consulting**

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd was appointed by Zitholele Consulting (Pty) Ltd to undertake a Heritage Walk Down and to compile a Site Specific Heritage Management Plan for the proposed development and construction of a 132kV power line from Mothibistad substation to Sekgame switching station, Northern Cape Province.

The overall management of heritage resources must lean towards the conservation of the resource *in situ* and as such to the demarcation of such sites as "no-go" areas during construction.

However, where the cost implication and socio-economic implications outweigh such an option, the next option would be mitigating the impact on the resource by means of the documentation of the site through sampling/surface collections, and in some cases controlled excavations, to collect a representative sample for further study of the site.

All other identified heritage resources must be demarcated as no-go areas during construction, and monitored during and upon completion of construction for damage.

Table 1 lists the sites of concern and associated pylon numbers and management recommendations where needed. Sites not listed here need no further management

Table 1 - Management measures for heritage resources – Mathibistad substation to Sekgame switching station alignment

Site Number	Description	Coordinates	Management Measures
K013	Cemetery near MV133	-27.685899°, 23.390736°	• Demarcate the site as a no go area, with a 20-meter buffer and a fence. • It is also recommended that the ECO be present during construction at this location. • If the graves will be disturbed in any way and a buffer is not possible, a grave relocation process will need to take place
K019	Historic structure near MV68	-27.590395°, 23.450690°	• Demarcate the site as a no go area, with a 20 meter buffer.

			• The site must be monitored during construction • Recording of the structure before destruction if the building is to be destroyed or disturbed
K020	Cemetery near MV68	27.591653°, 23.450499°	At least 9 graves are located about 20m W of MV133. A 20 m buffer should be placed around the graves and they should be fenced off, if the pylon position can not be moved. It is also recommended that the ECO be present during construction at this location
K023	Stone Age Site near MM27	-27.452002°, 23.444257°	• Demarcate the site as a no go area, with a 20-meter buffer. • The site must be monitored during construction. • The pylon should be moved at least 20 m west of the site. • Alternatively, the site should be mitigated where a surface collection takes place if the site cannot be avoided.

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The aim of the study is to identify all heritage sensitive areas, document, and assess their importance within the Local, Provincial and National context. From this we aim to assist the developer in managing the discovered heritage resources in a responsible manner in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

General site conditions and features on site were recorded by means of photos, coordinate locations, and description. Management measures to be implemented during construction are supplied in this report.

2 PROJECT DESCRIPTION

2.1 General Description of the Affected Landscape - Area Surveyed

The study area is located within the northern parts of the Northern Cape Province. There are three sections, Mothibistad to Moffat substations Moffat to Valley substations and Valley to Sekame substations.

Most of the area is characterised by a Kalahari Sand substrate, making finds in this zone susceptible to post-depositional movement (vertical and horizontal). Since much of the area is used for cattle ranching the archaeological finds are subjected to modern trampling. There is also intensive aardvark, ground squirrel, scrub hare, warthog and springhare burrowing in the area.

Figure 1: View of the Mothibistad Substation.

Figure 2: General view of the study area along Buitekant Street N E from Kuruman.

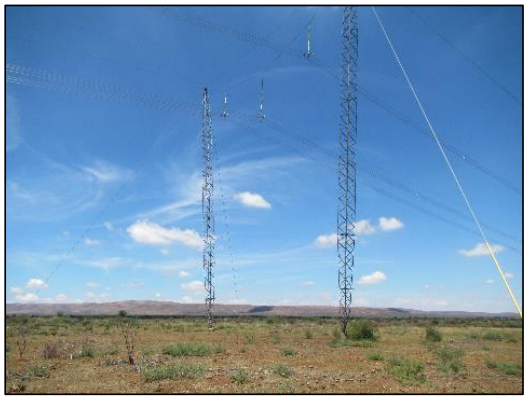

Figure 3: View of the existing power line and servitude near the R31, south of Kuruman.

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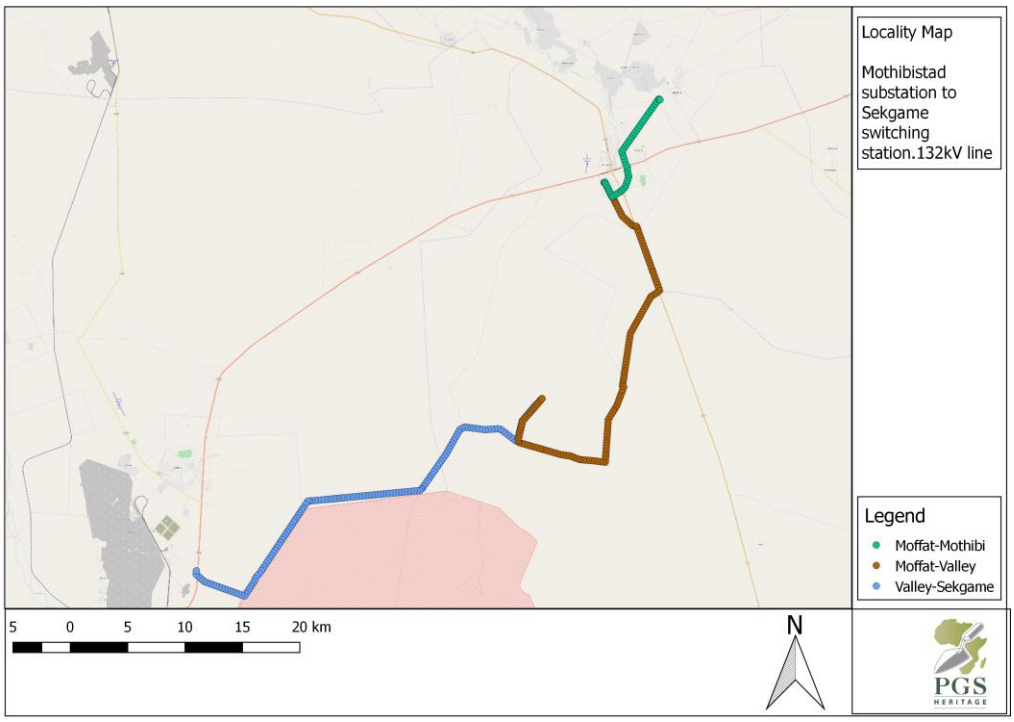


Figure 11: Locality map and alignment of power line

2.2 Methodology

This Heritage Walk Down report was compiled by PGS Heritage (Pty) Ltd for the proposed development and construction of a 132kV power line from Mothibistad substation to Sekgame switching station, Northern Cape Province, including applicable maps, tables and figures, as stipulated in the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (no 107 of 1998).

The process consisted of two steps:

- Step I – Physical Survey: A physical survey was conducted on foot along the proposed project area by qualified archaeologists, aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

- Step II – The final step involved the recording and documentation of relevant heritage resources, report writing, as well as mapping and management recommendations.

2.3 Specialist Qualifications

This report was compiled by PGS Heritage (Pty) Ltd.

The staff at PGS Heritage has a combined experience of nearly 70 years in the heritage consulting industry. PGS Heritage and its staff have extensive experience in managing HIA processes. PGS Heritage will only undertake heritage assessment work where the staff has the relevant expertise and experience to undertake that work competently.

Wouter Fourie, Project Sponsor for this project, is an Accredited Heritage Practitioner with the APHP (Association of Professional Heritage Practitioners – Western Cape) and is registered with the Association of Southern African Professional Archaeologists (ASAPA) and has CRM accreditation within the said organisation.

Jessica Angel, the author of this report, holds a Masters degree in Archaeology and is registered as a Professional Archaeologist with the Association of Southern African Professional Archaeologists (ASAPA).

Tim Forssman is a doctoral graduate from the University of Oxford, United Kingdom, where he specialised in Stone Age research focusing on forager-farmer interactions. His research is primarily in these fields but also rock art. He is an active member in the Association of Southern African Professional Archaeologists and is affiliated with the University of the Witwatersrand.

2.4 Physical surveying

The study area for the project covers a proposed route or alignment of approximately 70 kilometres. Between the Substations. Due to the nature of cultural remains, with the majority of artefacts occurring below surface, an intensive foot-survey that covered the study area was conducted. A controlled-exclusive surface survey was conducted over a period of 5 days (14 – 18 November 2016) on foot by archaeologists from PGS. The fieldwork was documented and tracked through a track log generated by GPS.

The survey focussed on the identified servitude corridors and tower locations (as provided by Eskom) that was then surveyed on foot and find sites were documented. If and/or where sites were

found in the footprint area of pylons, alternative positions were evaluated for the relocation of the pylon within the existing servitude.

All sites identified both inside and bordering the proposed alignment were plotted on 1:50 000 maps and their GPS co-ordinates documented. In addition, digital photographs were used to document all the sites.

3 LEGISLATIVE REQUIREMENTS

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

i. National Environmental Management Act (NEMA), Act 107 of 1998
ii. National Heritage Resources Act (NHRA), Act 25 of 1999
iii. Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. National Environmental Management Act (NEMA) Act 107 of 1998:
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)
    c. Environmental Impact Assessment (EIA) – Section (32)(2)(d)
    d. Environmental Management Plan (EMP) – Section (34)(b)
ii. National Heritage Resources Act (NHRA) Act 25 of 1999:
    a. Protection of Heritage Resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38
iii. Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002:

3.1 Terminology and Abbreviations

Archaeological resources

This includes:

i. 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;

ii. rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
iii. wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, 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;
iv. features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the 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:

i. construction, alteration, demolition, removal or change in use of a place or a structure at a place;
ii. carrying out any works on or over or under a place;
iii. subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
iv. constructing or putting up for display signs or boards;
v. any change to the natural or existing condition or topography of land; and
vi. any removal or destruction of trees, or removal of vegetation or topsoil

Earlier Stone Age

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance

Holocene

The most recent geological time period, which commenced 10 000 years ago.

Later Stone Age

The archaeology of the last 30 000 years, associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Table 2: Table of abbreviations

ABBREVIATIONS	DESCRIPTION
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Service (Pty) Ltd
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SAHRA	South African Heritage Resources Agency

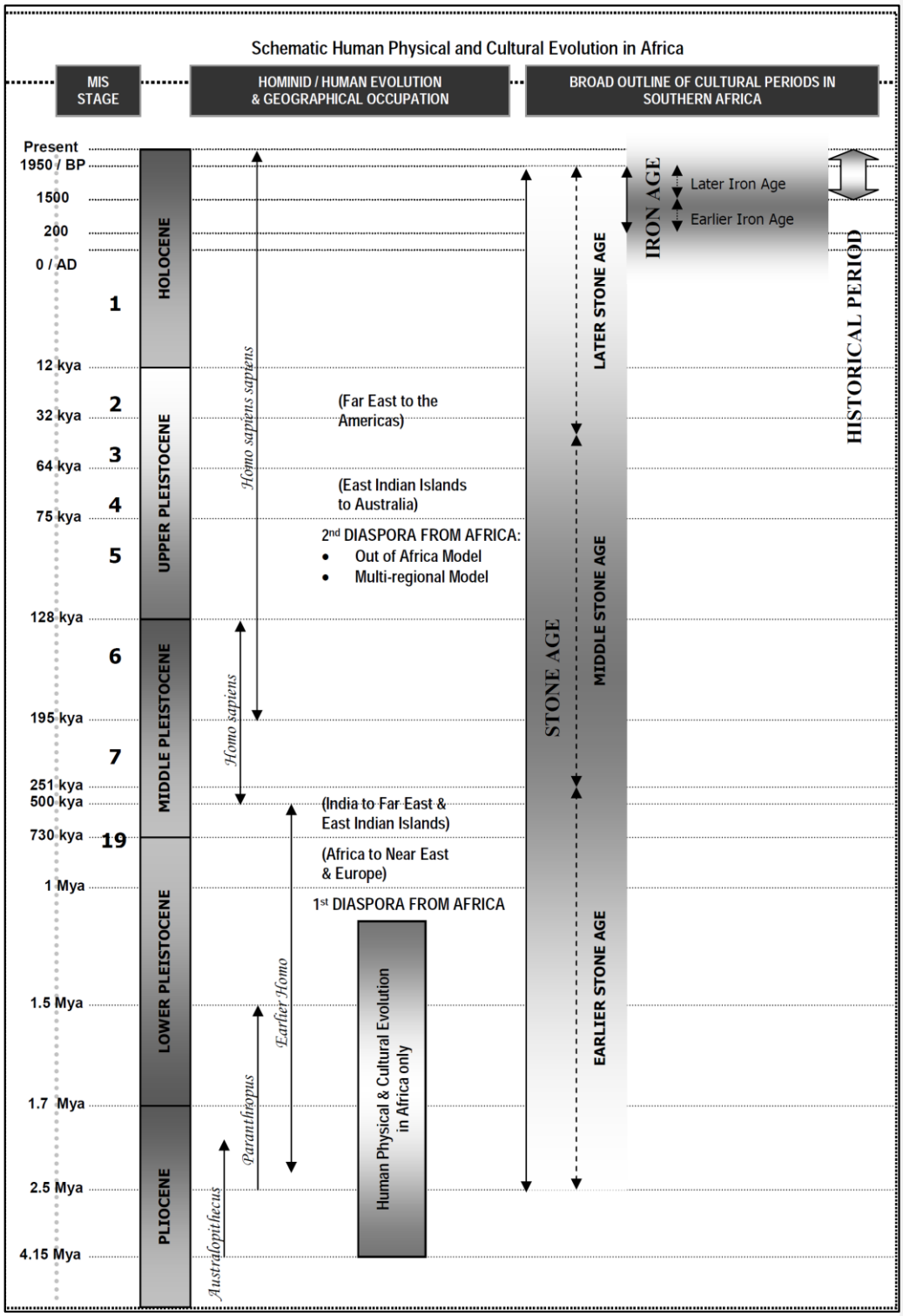


Figure 12: Human and Cultural Timeline in Africa ((Morris, 2008))

3.2 Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report (see **Table 3**).

Table 3: Site significance classification standards as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)		High/Medium	Mitigation before destruction
Generally Protected B (GP.B)		Medium	Recording before destruction
Generally Protected C (GP.C)		Low	Destruction

4 HISTORICAL BACKGROUND

The examination of heritage databases, historical data and cartographic resources represents a critical additional tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Therefore, an internet literature search was conducted and relevant archaeological and historical texts were also consulted. Relevant topographic maps and satellite imagery were studied.

4.1 Previous Studies

Researching the SAHRA APM Report Mapping Project records and the SAHRIS online database (http://www.sahra.org.za/sahris), it was determined that a great number of previous archaeological studies overlapped or were adjacent to the study area. Several other previous archaeological or historical studies had been performed within the wider vicinity of the study area. A selection of previous studies for the area in the APM Report Mapping Project are listed in chronological order:

- Morris, D. & Beaumont, P.B. 1994. **Ouplaas 2 Rock Engravings, Danielskuil.** An unpublished report by the McGregor Museum on file at SAHRA as 1994-SAHRA-0025.
- Morris, D. 1999. **Proposed Mining Areas and Properties at Ulco, Northern Cape, Including the Vicinities of Gorrokop and Groot Kloof.** An unpublished report by the McGregor Museum on file at SAHRA as 1999-SAHRA-0055.
- Beaumont, P.B. 2000. **Archaeological Impact Assessment: Archaeological Scoping Survey for the Purpose of an EMPR for the Sishen Iron Ore Mine.** An unpublished report by the McGregor Museum on file at SAHRA as 2000-SAHRA-0023.
- Morris, D. 2001. **Report on Assessment of Archaeological Resources in the Vicinity of Proposed Mining at Morokwa.** An unpublished report by the McGregor Museum on file at SAHRA as 2001-SAHRA-0078.
- Beaumont, P.B. 2004. **Heritage EIA of Two Areas at Sishen Iron Ore Mine.** An unpublished report by the McGregor Museum on file at SAHRA as 2004-SAHRA-0067.
- Morris, D. 2005. **Report on a Phase 1 Archaeological Assessment of Proposed Mining Areas of the Farms Bruce, King, Mokaning and Parson, Between Postmasburg and Kathu, Northern Cape.** An unpublished report by the McGregor Museum on file at SAHRA as 2005-SAHRA-0032.
- Beaumont, P.B. 2005a. **Heritage Impact Assessment of an Area of the Sishen Iron Ore Mine that may be Covered by the Vliegveldt Waste Dump.** An unpublished report by the McGregor Museum on file at SAHRA as 2005-SAHRA-0230.
- Beaumont, P.B. 2005b. **Heritage Impact Assessment for EMPR Amendment for Crusher at Sishen Iron Ore Mine.** An unpublished report by the McGregor Museum on file at SAHRA as 2005-SAHRA-0259.
- Beaumont, P.B. 2006a. **Phase 1 Heritage Impact Assessment Report on Erf 1439, Remainder of Erf 2974 and Remainder of Portion 1 of the Farm Uitkoms No 463, and Farms Kathu 465 and Sims.** An unpublished report by the McGregor Museum on file at SAHRA as 2006-SAHRA-0127.

- Beaumont, P.B. 2006b. **Phase 1 Heritage Impact Assessment Report on Portions A and B of the Farm Sims 462, Kgalagadi District, Northern Cape Province.** An unpublished report by the McGregor Museum on file at SAHRA as 2006-SAHRA-0165.
- Beaumont, P.B., 2006c. **Phase 1 Heritage Impact Assessment Report on Portion 48 and the remaining Portion of Portion 4 of the Farm Bestwood 459, Kgalagadi District, Northern Cape Province.** An Archaeological Impact Assessment report by the Archaeology Department, McGregor Museum, prepared for MEG Environmental Impact Studies.
- Dreyer, C. 2006. **First Phase Archaeological and Cultural Heritage Assessment of the proposed residential developments at the farm Hartnolls 458, Kathu, Northern Cape.** Accessed SAHRIS 14 August 2014.
- Beaumont, P.B. 2007. **Supplementary Archaeological Impact Assessment report on sites near or on the Farm Hartnolls 458, Kgalagadi District Municipality, Northern Cape Province.** Accessed SAHRIS 14 August 2014.
- Dreyer, C. 2007. **First Phase Archaeological and Cultural Heritage Assessment of the Proposed Garona-Mercury Transmission Power Line, Northern Cape, North-West Province & Free State.** An unpublished report by Pr. Archaeologist/Heritage Specialist on file at SAHRA as 2007-SAHRA-0052.
- Beaumont, P.B. 2008a. **Phase 1 Archaeological Impact Assessment Report on Portion 459/49 of the farm Bestwood 459 at Kathu, Kgalagadi District Municipality, Northern Cape Province.** Accessed SAHRIS 14 August 2014.
- Beaumont, P.B. 2008b. **Phase 1 Heritage Impact Assessment Report on a portion of the remainder of the farm Sekgame 461, Kathu, Gamagara Municipality, Northern Cape Province.** Accessed SAHRIS 14 August 2014.
- Dreyer, C. 2008a. **First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Developments at a Portion of the Remainder of the Farm Bestwood 459 Rd, Kathu, Northern Cape.** An unpublished report by Pr. Archaeologist/Heritage Specialist on file at SAHRA as 2008-SAHRA-0433.
- Dreyer, C. 2008b. **First Phase Archaeological and Cultural Heritage Assessment of the proposed Bourke project, ballast site and crushing plant at Bruce Mine, Dingleton, near Kathu, Northern Cape.** An unpublished report by Pr. Archaeologist/Heritage Specialist on file at SAHRA as 2008-SAHRA-0666.
- Kaplan, J.M. 2008. Phase 1 **Archaeological Impact Assessment: Proposed Housing Development, Erf 5168, Kathu, Northern Cape Province.** An unpublished report by the Agency for Cultural Resources Management on file at SAHRA as 2008-SAHRA-0487.
- Morris, D. 2008. **Archaeological and Heritage Phase 1 Impact Assessment for Proposed Upgrading of Sishen Mine Diesel Depot Storage Capacity at Kathu, Northern Cape.** An unpublished report by the McGregor Museum on file at SAHRA as 2008-SAHRA-0489.
- Morris, D. 2010. **Solar energy facilities. Specialist input for the environmental impact assessment phase and environmental management plan for the proposed Kathu-Sishen solar energy facilities, Northern Cape**. Accessed SAHRIS 13 August 2014.
- Van Schalkwyk, J. 2010. **Archaeological impact survey report for the proposed development of a solar power plant on the farm Bestwood 459, Kathu Region, Northern Cape Province**. Accessed SAHRIS 13 August 2014.

- Van der Ryst, MM and Küsel, SU. 2012**. Phase 2 specialist study of affected Stone Age locality at site SA02, a demarcated surface area, on the farm Nooitgedacht 469 (Woon 469).** Commissioned by Sishen Iron Ore Mine and AGES (Pty) Ltd.

- Dreyer, C. 2013. **First Phase Archaeological and Heritage assessment of the Vaal-Gamagara water pipeline project, Northern Cape: Revisit to the Kathu Pan archaeological site**. Report for MDA Environmental Consultants, Bloemfontein

- Beaumont, P.B. 2013. **Phase 2 archaeological permit mitigation report on a ~0.7 ha portion of the farm Bestwood 549, situated on the eastern outskirts of Kathu, John Taolo Gaetsewe District Municipality, Northern Cape Province.** Accessed SAHRIS 14 August 2014.

- Walker S.J.H., Chazan M., Lukich V. & Morris D. 2013**. A second Phase 2 archaeological data recovery at the site of Kathu Townlands for Erf 5116: Kathu, Northern Cape Province.** Accessed on SAHRIS 12 August 2014.

- Walker, S.J., Chazan, M & Morris, D. 2013. **Kathu Pan: location and significance. A report requested by SAHRA for the purpose of nomination.** Accessed SAHRIS 12 August 2014.

- Kaplan, J. **Heritage Impact Assessment proposed mixed use development in Kathu, Northern Cape Province. Remainder & Portion 1 of the Farm Sims 462, Kuruman RD**. Prepared for: Enviroafrica. Accessed on SAHRIS 14 August 2014.

- Walker, S. J. Chazan, M. and Morris, D. 2013**. Kathu Pan: location and significance. A report requested by SAHRA for the purpose of nomination**. SAHRIS accessed 20 April 2015.

- Kruger, N. 2014. **Sishen Iron Ore Mine: Stormwater infrastructure for the Sishen Mine, John Taolo Gaetsewe District Municipality, Northern Cape Province**. Report for AGES Gauteng. Accessed on SAHRIS 29 November 2016.

- Morris, D. 2014. **Rectification and/or regularisation of activities relating to the Bestwood township development near Kathu, Northern Cape: Phase 1 Archaeological Impact Assessment.** Accessed on SAHRIS 12 August 2014.

- Orton, J. and Walker, S. 2015. **Heritage Impact Assessment for a proposed 132 kV power line, Kuruman Magisterial District, Northern Cape.** Report for Savannah Environmental (Pty) Ltd. Accessed on SAHRIS 12 August 2014.

- Orton, J. 2016a. **Scoping Heritage Impact Assessment for the proposed Hotazel Solar Farm, Kuruman Magisterial District, Northern Cape**. Report for Aurecon South Africa (Pty) Ltd. Accessed 29 November 2016.

- Orton, J. 2016b. **Heritage Impact Assessment for proposed improvements on the N14 Sections 6 and 7 between Olifantshoek and Kathu, Postmasburg Magisterial District, Northern Cape**. Report for SLR Consulting (South Africa) (Pty) Ltd. Accessed 29 November 2016.

Researching the SAHRIS online database (http://www.sahra.org.za/sahris) further studies were identified in the vicinity of the study area:

- SAHRIS case number 1063. **Consultation in terms of Section 40 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an Environmental Management Plan for prospecting right in respect of manganese and sugillite on Portions 1 and 2 of the farm Curtis No.470, situated in Magisterial District of Kuruman, Northern Cape.**

- SAHRIS case number 1089. **Consultation in terms of Section 40 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an Environmental Management Programme for a mining right in respect of manganese and iron ore on Erf**

416, 417, 418, 419, 420, 421, 422, remaining extent of Erf 423, 424, 426, 493, 548, 549, (a portion of Portion 548), 550 (a portion of Portion 548), 551(a portion of Portion 548), 569, 679 (a portion of Portion 548), and 681 (a portion of Portion 548) of farm Dingleton township (now Dingle) 543 remaining extent of Portion 2 (Doornvlei), Portions 7, 11 (a portion of Portion 2) and 13 (a portion of Portion 2) of the farm Gamagara 541, remaining extent of Portion 19 (a portion of Portion 1), Portion 24 (a portion of Portion 19) and 25 (a portion of Portion 19) of the farm Sishen 543, remaining extent of Portion 2 (Parson a) and Portion 6 (a portion of Portion 2) of the farm Parson 564, remaining extent, remaining extent of Portion 2 (Grensplaat) and Portion 4 (Stuk) of the farm Fritz No.540, situated in the Magisterial District of Kuruman, Northern Cape region.

- SAHRIS case number 1332. **Resources Development Act 2002, (Act 28 of 2002) for the approval of an amendment to the Environmental Management Programme for a mining right in respect of iron ore on Portion 2, 6 and the remainder of farm Parson Po. 564, Portions 1,2,3 and the remainder of farm King No. 561, Portion 3,4,5 and the remainder of Bruce No.544, Portion 1,2,3,4,5 remainder of Mokaning No.560 situated in the Magisterial District of Kuruman, Northern Cape.**

- SAHRIS case number 1402. **Consultation in terms of Section 40 of the Mineral and Petroleum Resources Development Act of 2002, (Act 28 of 2002) for the approval of an Environmental Management Plan in respect of borrow pits 1,2,3,4,5,6,7,8 & 9 on Portion 19 of farm 543, remaining extent and Portion 1 of Gamagara 541, Portion 1 and Portion 2 of Fritz 540, remainder of Nooitgedacht 469 and remainder of Lylyveld 545, situated in the Magisterial District of Kuruman Northern Cape region.**

- SAHRIS case number 1411. **Consultation of scoping report submitted in terms of Section 22 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) in respect of remaining extent of Portion 1 (Barnadene) of farm sims No.462, remaining extent of and remaining extent and remaining extent of Portion 2 (Rusoord) and remaining extent of Portion 3 (Portion of Portion 1) of Farm Sacha No.468, remaining extent of Portion 4 of the farm Gamagara No.541, remaining extent of Portion 1 (lot a) of the farm Sishen No. 543, situated in the Magisterial District of Kuruman.**

- SAHRIS case number 1505. **Environmental Impact Assessment and Environmental Management Programme.**

- SAHRIS case number 2516. **Consultation in terms of Section 40 of the Mineral and petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an Environmental Management Plan for mining permit for aggregate gravel on the remainder of the farm Galway No.431, situated in the Magisterial District of Kuruman, Northern Cape region.**

- SAHRIS case number 2769. **Proposed construction of 400kV transmission line from Ferrum substation (Kathu) to Garona substation (Groblershoop) in the Northern Cape.**

- SAHRIS case number 3029. **Proposed Development of 3 500 Erven on 280 Ha of Vacant Land on a Portion of Remainder of Farm Sekgame 461, Kathu.**

- SAHRIS case number 3157. **Consultation in terms of section 40 of the mineral and petroleum resources development act 2002, (act 28 of 2002) in respect of prospecting for manganese and iron ore on the farm Seldsden No.464 situated in the Magisterial District of Kuruman, Northern Cape Region.**

- SAHRIS case number 3615. **Proposed borrow pits associated with the upgrade of the Kimberley – Hotazel Railway Line**

- SAHRIS case number 3698. **Proposed relocation of the Vaal Gamagara water pipeline at the Sishen Iron Ore Mine.**
- SAHRIS case number 3701. **Proposed relocation of Rail and Associated Infrastructure at Sishen Iron Ore Mine.**
- SAHRIS case number 4456. **Proposed development of 380ha for residential uses, Kathu, Portion 175/1 and Portion 175/2, Joe Morolong Local Municipality, John Taolo District Municipality, Northern Cape Province.**
- SAHRIS case number 4785. **SAHRA comments for the Heritage Impact Assessment Report for the Kalahari Solar Power Project located on Famr Kathu 465, near Kathu within the Northern Province.**
- SAHRIS case number 4460. **Residential development on Remainder, and Portion 3 of Farm Bestwood 459 near the town of Kathu, Northern Cape.**
- SAHRIS case number 5323. **EIA and EMPr for the Proposed Solar CSP Integration Project: Project 2 - 400kV Power Line from Ferrum to the Solar Substation.**
- SAHRIS case number 5648. **The project will consist of the construction of an approximately 67km Double Circuit 400kV powerline from the Manganore Substation to the Ferrum Substation, including the construction of the new Manganore TX (Transmission) Substation adjacent to the existing Manganore DX (Distribution) Substation. The line runs in a northerly direction through areas of the Tsantsabane, Ga-Segonyana and Gamagara Local Municipalities in the Northern Cape Province.**

4.2 Heritage and archaeological background

Most of the studies listed above located surface scatters of Stone Age artefacts of limited significance (e.g. Dreyer 2008a, 2008b; Kaplan 2008; SAHRIS case number 3029) if not actual Stone Age sites. A few studies did not identify any heritage resources (e.g. Beaumont 2006a; SAHRIS case number 1063; SAHRIS case number 2769; SAHRIS case number 5323) although in some cases this was possibly because the survey area had already been altered by mining activities (e.g. Dreyer 2008b). Many studies referred to the Kathu Pan site, an ancient limestone sinkhole formation discovered in 1974 during the establishment of the town of Kathu and renowned for both significant palaeontological (including specimens from up to 850 000 years BP) and Stone Age deposits from 500 000 BP onwards (e.g. SAHRIS case number 4785). Equally, a number of studies consulted referred to the Uitkoms 1 site on Kathu Hill with its high number of Stone Age artefacts (e.g. SAHRIS case number 4785).

Four of the studies consulted on the SAHRIS website had no relevant documents available (SAHRIS case number 1089; SAHRIS case number 2516; SAHRIS case number 3157; SAHRIS case number 3701). One study referred to heritage sites listed in an earlier impact assessment document, the latter not being available on the SAHRIS website (SAHRIS case number 1332). Some studies had documentation with no relevant heritage information (e.g. SAHRIS case number 1402) or

documentation which referred to the need for completion of archaeological studies (e.g. SAHRIS case number 1411).

In a survey for the expansion of the Sishen Mine immediately to the south of the current study area Beaumont (2000) recorded surface LSA lithics which he stated were not associated with living sites. This study also listed a large number of Stone Age artefacts as well as two Iron Age collections from the near vicinity of the study area and accessioned in the McGregor Museum. In the vicinity of the study area Beaumont (2004) recorded only surface scatters of possible Acheulian lithics while later studies in approximately the same area located no heritage resources (Beaumont 2005a, 2005b) or, again, a few scattered stone tools of MSA appearance (Morris 2008). Morris (2001) noted through a survey of 25 km between Postmasburg and Kathu, in which he located surface scatters of stone artefacts, that the area is known for specularite workings and that any development should take cognisance of this. He further recorded stone artefact scatters on hills and in plains, ceramic remains reflecting Tswana settlements and four cemeteries in a 10 km survey nearby (Morris 2005), attesting to the diversity but also distribution of heritage remains.

To the north of Kathu Beaumont (2006) undertook a survey for the Kalahari Gholf en Jag development. While no significant new heritage resources were located in this survey the author referred to previous surveys and excavations undertaken on the properties involving nine archaeological sites. These included six of the Kathu Pan sites characterised variously by Late Pietersburg, Howiesons Poort, Fauresmith and Wilton technologies, as well as Later Stone Age ceramics. One site, the Kathu Townlands site, excavated in the 1980s, was found to contain approximately 10 000 Acheulian artefacts per cubic metre and a Late Iron Age site thought to be of Tswana origin (Beaumont 2006). This and other surveys in the area has stressed the high importance of the Kathu Pan sites and recommended that its northern area be excluded from any development, especially as the use of GPS technology had improved the accuracy of mapping and it had been found that some of the sites now fell within the development area (SAHRIS case number 4456). Many of the other studies referred to these and other known heritage sites such as, for example, specularite workings on the Gamagara River to the south west of Kathu (e.g. SAHRIS case number 3029).

In a survey of two options for a power line route Dreyer (2007) noted the wealth of stone tool sites in the vicinity of Kathu, particularly extensive ESA sites and the presence of the Kathu cemetery, suggesting mitigation measures to avoid these. A survey for the Kalahari Solar Power project some 5 kilometres to the north of the current study area located a number of Stone Age sites as well as surface scatters of lithics and referred to the possibility of significant sub-surface deposits in a number of localities (SAHRIS case number 4785). On the Ghaap Escarpment, Morris (1999) identified

LSA and MSA lithics and referred to known rock painting sites at Groot Kloof. These paintings are of unusual quality and the most elaborate of their kind along the Ghaap escarpment (Morris 1999; SAHRIS case number 1505). Rock engravings at Lime Acres some 80 kilometres to the south east consist of 119 distinct images spread over some 22 dolomite rock slabs and are interesting in that they are fairly recent, depicting colonial scenes such as horses with riders and were likely engraved by Korana people descendants of Khoekhoen pastoralists (Morris & Beaumont 1994).

Van der Ryst and Küsel (2012) conducted a Phase 2 around a pan and surrounds for a proposed extension of the Sishen waste dump. Sampling of the lithics produced low to medium densities of MSA and LSA tool types on the plains and the periphery of the pan and surrounds. This is consistent with the results from several surveys as discussed above. Where Stone Age occurrences have been documented these are usually distributed either in fairly low scatters over large areas or in very high densities where outcrops of, in particular, Banded Ironstone Formations (BIFs) and dolerite occurs. Surface sites around Kathu exhibit a palimpsest of prehistoric utilization and may contain lithics from all periods in the Stone Age succession. Understanding site formational processes and artefact contexts is thus of prime importance when considering the significance of these sites.

It is therefore important to note a concern raised by Morris (2014: unpaged) that a "consistent issue in the assessment of the presence or absence of archaeological deposits in and around Kathu … is the fact that the landscape is often capped by (1) calcrete (not uniformly ancient – Walker et al 2013) and (2) younger Gordonia Formation Aeolian sands (Almond 2014)". That subsurface archaeological remains may occur under overlying soils and calcretes should be taken into account when archaeological and heritage surveys are undertaken. The clearing of topsoils during development activities frequently exposes archaeological deposits. In areas where BIF and dolerite outcrops occur there tends to be extremely high densities of lithics. Both raw materials are an excellent source of good tool-stone and were used commonly by ESA, MSA and LSA stone tool producers. In each techno-complex the materials were used to produce a variety of tools, such as Large Cutting Tools (LCTs) in the ESA and scrapers in the MSA and LSA. Significant exposures of siliceous BIFs and dolerites in association with high levels of lithic production have been recorded at, for example, Kathu Townlands and Bestwood.

The LCT's from this area often contain very fine handaxes with some superb examples produced on banded ironstone. Lithics in some of the Acheulian deposits, but also in MSA levels, display a shiny silica skin. At Kathu Townlands an outcropping of banded ironstone that covers a large area of around 25 km contains enormous quantities of flaked items. This phenomenon is ascribed to the use of the high-grade rock as a source for raw materials and is supported by the high incidence of handaxe roughouts suggesting on site manufacturing took place (Beaumont 2004b). The prepared

core technique was used to produce the spectacular small handaxes, long blades, convergent flakes/points, scrapers found in Fauresmith collections.

The Kathu Complex sites contain important ESA Acheulian and transitional ESA/MSA Fauresmith assemblages (Beaumont, 1990, 2004, 2013; Herries, 2011; Chazan et al, 2012; Wilkins & Chazan, 2012; Walker et al, 2014). Walker et al (2014) suggest that the intensive occupation of the Kathu region can be linked to the availability of water resources. Current research projects are yielding important data on typologies, lithic technologies, technological innovations, complex spatial organization and also dates for the ESA Acheulian and for the MSA assemblages. Research at Kathu Pan 1 established a date of 500 000 years for a Fauresmith blade assemblage where blades were systematically removed from prepared cores (Wilkens & Chazan, 2012).

Archaeological and palaeoenvironmental data from Kathu Pan and Kathu Townlands were used to reconstruct changes over time in the prehistoric environment (Beaumont 2004b). Associated faunal remains with some of the Acheulian include *Elephas recki recki*. These animals disappeared at sites in East Africa such as at Olorgesailie, Kenya, at around 600 000/800 000 years ago (Beaumont, 2004b; McNabb, 2004). Biostratigraphy or faunal correlation is often used to date the southern African sites and gives some indication of the approximate age of some of the associated assemblages. More recently a combination of OSL and ESR/U-series dating (Porat et al, 2010; Herries, 2011; Walker et al, 2014) were used to date the transition to MSA tool forms. At Kathu Pan the transitional Fauresmith has been dated to ca. 500 000 BP (Porat et al, 2010). Kathu Pan is formed by a shallow depression with an internal drainage and a high water table.

North-east of Kathu several newly-found ESA sites with LCT's and an associated range of tools occur in sand quarries and on a hilltop at Uitkoms Farm and the Bestwood locality (Chazan et al, 2012). The residential and commercial developments at Bestwood and close to the Townlands demonstrate the importance of Phase 2 heritage studies in the Kathu region.

The concerns that Walker et al (2014:8) raise with regard to the impact of the exponential development should feature in any survey that is undertaken around Kathu. With reference to the Townlands locality they urge that a "broader landscape-based effort of subsurface testing including palaeo-landscape and paleo-environmental reconstruction is essential to our understanding of this extraordinary recorded. Sources of this information must be protected along with archaeological remains. Together with the other components of the Kathu Complex, this site represents a high density of hominin occupation that presents a challenge to reconstructions of hominin adaptations during the Early-Middle Pleistocene". Orton and Walker (2015:12) further remark on the on the significance of Kathu by emphasizing "*that the area is best regarded as an archaeological landscape rather than a collection of individual sites*". Therefore, this extended region likely represents a large

landscape-wide spread of archaeological remains that are the result of specific geological conditions, site formation processes, prehistoric behaviour habits (including settlement patterns) and access to water. However, Orton (2016b) notes that the archaeological sequence is not equally represented across the region with some areas exhibiting very little evidence of heritage remains. The exact reasons why this is the case is unknown.

The area around the Kathu cemetery was previously studied by Beaumont and lithic densities and debitage frequencies found at Uitkoms 1 was comparable from those found at Kathu Townlands 1. He describes Uitkoms 4 closest to the current study area as a buried site of approximately 100 m wide. No controlled excavations have been done at Uitkoms 4.

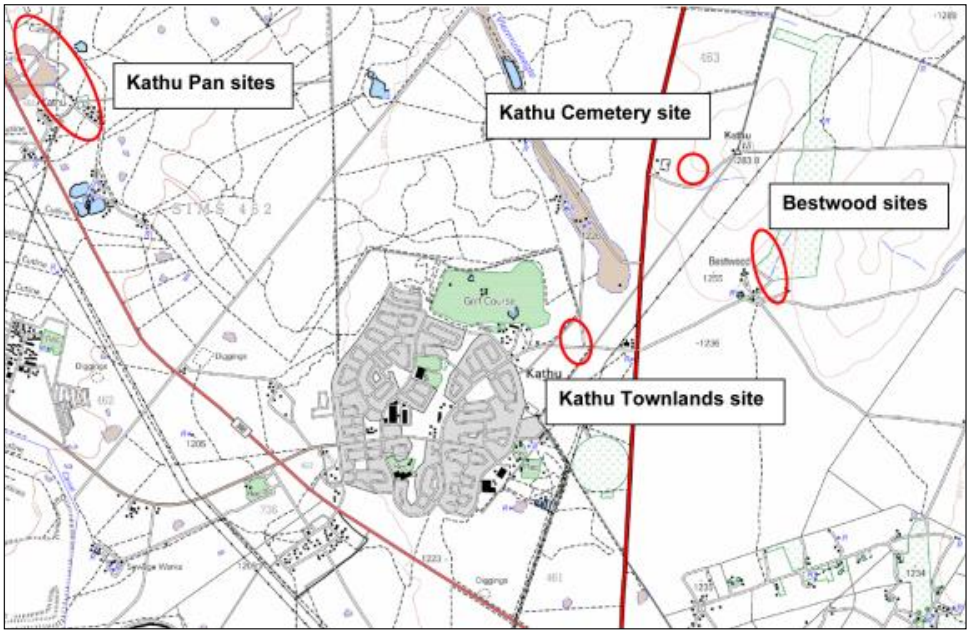


Figure 13: This map depicts the positions of the sites collectively known as the Kathu Archaeological Complex

4.2.1 The Kathu Pan Sites

The Kathu Pan has been described by Klein (1984) as the best paleoenvironmental sequence from the Kalahari Basin area. It is a broad surface of organic marshland that is located in the centre of four farms (Marsh 467, Sacha 468, Kathu 465 and Sims 462), 15 km north of Sishen.

In the past the pan would have been maintained by artesian seepage rather than surface waters (Klein 1984). Due to this, Butzer (1984) maintains that from a sedimentological perspective the

Kathu Pan is unique. He points out that the long term ground water trends provide a filtered climatic record that affords unique evidence for protracted climatic intervals during the Pleistocene. The particular environment provided a range of subsistence resources as pointed out by Van Zinderen Bakker (1995: 101).

> '*Since ESA times the water table at the pan has mostly been so high that, under natural conditions, it rises in summer above the peaty surface. This environment provided an oasis for prehistoric people and animals'*

However, since the extraction of ground water pumped to supply Kathu with water, the surface of this water body has not risen above the ground surface (Klein, 1984, Walker et al, 2013).

The pumping activities revealed a covered karst in the calcrete substrate of the Kathu Pan. Klein (1984) explains that although calcrete is commonly found 2-3m below the surface, an 8m drop of the water table due to excessive ground water extraction has led to compaction of the numerous doline fills with collapse and partial exposure of the sedimentary sequence.

Due to the above-mentioned processes, the Kathu Pans has become an incredibly significant archaeological site. In 1974, handaxes and faunal remains were discovered in the walls of a newly formed doline near the farmstead of then farm manager Naas Viljoen (**Figure 2**). Viljoen called the McGregor Museum when his children discovered the artefacts whilst playing in the doline (Walker et al, 2013).

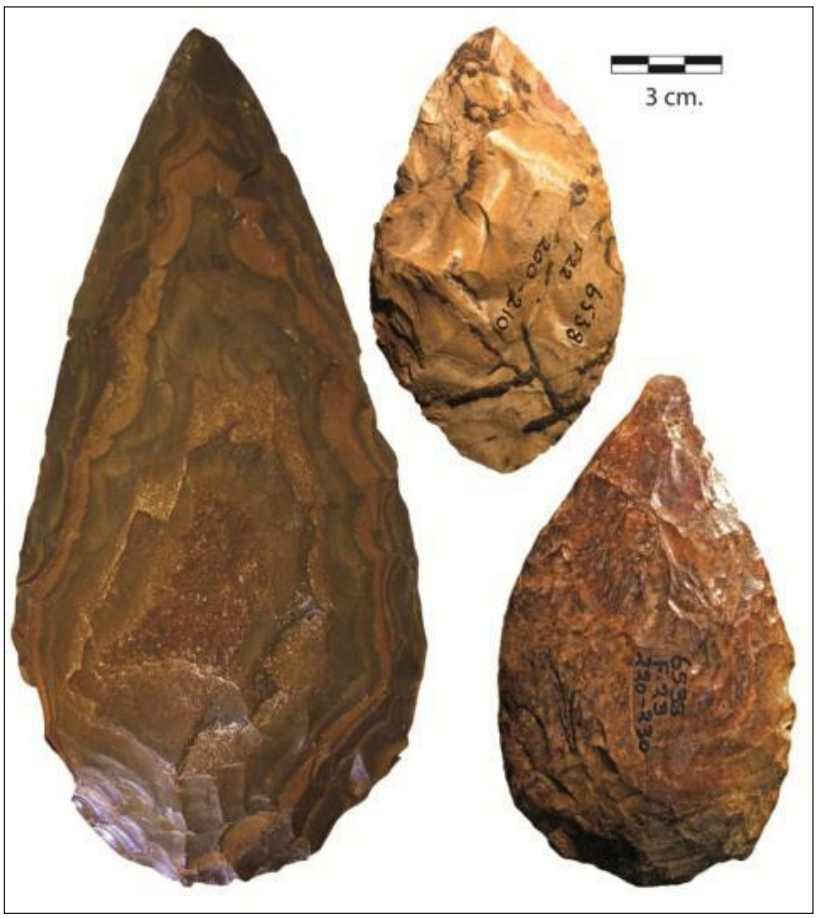


Figure 14: Three handaxes recovered from the Kathu Pan sites (Walker et. al. 2013:15)

The first archaeologist to conduct work on the Kathu Pan sites was A.J B. Humphreys on 13 August 1975. Subsequently, P.B. Beaumont conducted extensive studies in the vicinity. Beaumont began his initial research in the area just after he was appointed to the McGregor Museum in 1978 (Walker et al, 2013). During this year several researchers visited the site. These included botanist Andy Gubb, pollen scientist Van Zinderen Bakker, Professor van der Merwe (University of Pretoria) as well as John Vogel (The Quaternary Dating Research Unit (QUADRU).

In the article written by Walker et al (2013), the history of research on the pan is made clear. Walker et al (2013) describe the official excavations at the site referred to as KP1 in 1980 as this is where most research at the pan sites have been conducted. Excavations were then undertaken at KP1 – KP5 in 1982. In 1983 KP5, KP6 and KP7 were excavated. In 1984, surface collections were undertaken at KP11. In 1985 KP6 and KP8 were excavated and KP9 was excavated in 1990. Also in 1990, KP10

was mechanically dug, however no archaeological excavations were conducted. During 1990 to 2004 there was a gap in the research conducted in the area. Thereafter, Dr Chazan and other members of the research team on the Kathu Pan conducted further excavations and research at the site. It was through this extended research and a re-examination of previous work that KP1 was declared as a Grade 1 site in 2013.

In 1990, P.B. Beaumont created a schematic map, which depicts the localities and details of 11 sites within the Kathu Pan. The current team researching the site used this map and geo-rectified it atop the CDSM 1:50 000 map 2723CA (1972) in order to gain approximate GPS coordinates for each of the localities previously mapped by Beaumont.

A buffer zone has not yet been established around the Kathu Pan sites. According to Walker et al (2013) a considerable amount of fieldwork still needs to be undertaken to clarify the extent of the deposit. They noted that while the sink holes have offered windows into the deposits around the pan, and some excavations around the 1980s have offered clues to the deposits outside the sink holes, the overall extent of what the Kathu Pan sites have to offer is unknown.

The Kathu Pan is an exceptionally significant landscape, one of the reasons being that the archaeological deposits contain both ESA artefacts and associated fauna in near primary context (Walker et al 2013). This is unusual as only seven southern African sites contain ESA artefacts and bones in primary context (Cave of Hearths, Wonderwerk, Pomongwe, and the open air sites of Elandsfontain, Mwanganda, Namib IV and Kathu Pan) (Volman, 1984).

The second reason for the high significance of Kathu Pan is that it also includes stratified deposits from the MSA. Walker et al point out that most MSA sites are along the coast and in caves or shelters, whereas there are MSA deposits in an open-air setting in the interior at Kathu.

In conclusion, the Kathu Pan sites are of considerable significance due to the unique geology and formation of the dolines, which could be considered as windows into the past. Kathu Pan Site 1 contains a near perfect stratigraphy of the ESA, MSA and LSA that provides the best paleoenvironmental sequence from this area as well as a useful guide to archaeological events.

4.2.2 The Kuruman Hills

Before 1973, very few sites had been excavated in the Northern Cape (Humphreys & Thackeray 1983). The Kuruman Hills is an important archaeological feature of the landscape. Humphreys and

Thackeray's (1983) seminal work in the Northern Cape included several sites in this hill complex. Their work not only helped develop the discipline of archaeology, but it showcased the significant archaeology of the region. Between 1973 and 1980 they excavated 10 sites in the Kuruman Hills and on the Ghaap Plateau, which includes Blinkklipkop, Burchell's Shelter, Dikbosch 1 and 2, the Doornfontein Mines, Little Witkrans Shelter, Powerhouse Cave, and Wonderwerk Cave. The latter site is of global significance and is currently seeing renewed interest from an international team conducting a highly detailed study of the site (Chazan & Horwitz 2015). Although archaeology exists throughout these hills, it is mostly in shelter contexts that the archaeological traces are in primary contexts and/or best preserved and undisturbed.

Wonderwerk Cave has the most extensive archaeological sequence in the Northern Cape and is one of southern Africa's most important shelter sites when it comes to Pleistocene to Holocene archaeology (**Figure 3**). The representation of material remains from the ESA (±2 MYA) to historic times is unusual and provides deep insights into the region's archaeology. The ESA Acheulean lithics at Wonderwerk Cave date to approximately 780 000 BP and are followed in sequence by MSA Fauresmith tools dating to between 276 000 and 510 000 BP. Lastly, the LSA is represented by one of the only known Oakhurst assemblages from the region, known as the locally as the Kuruman Industry and which is characterised by large macrolithic tools, followed by Wilton Industry microlithic tools (Beaumont & Vogel, 2006).

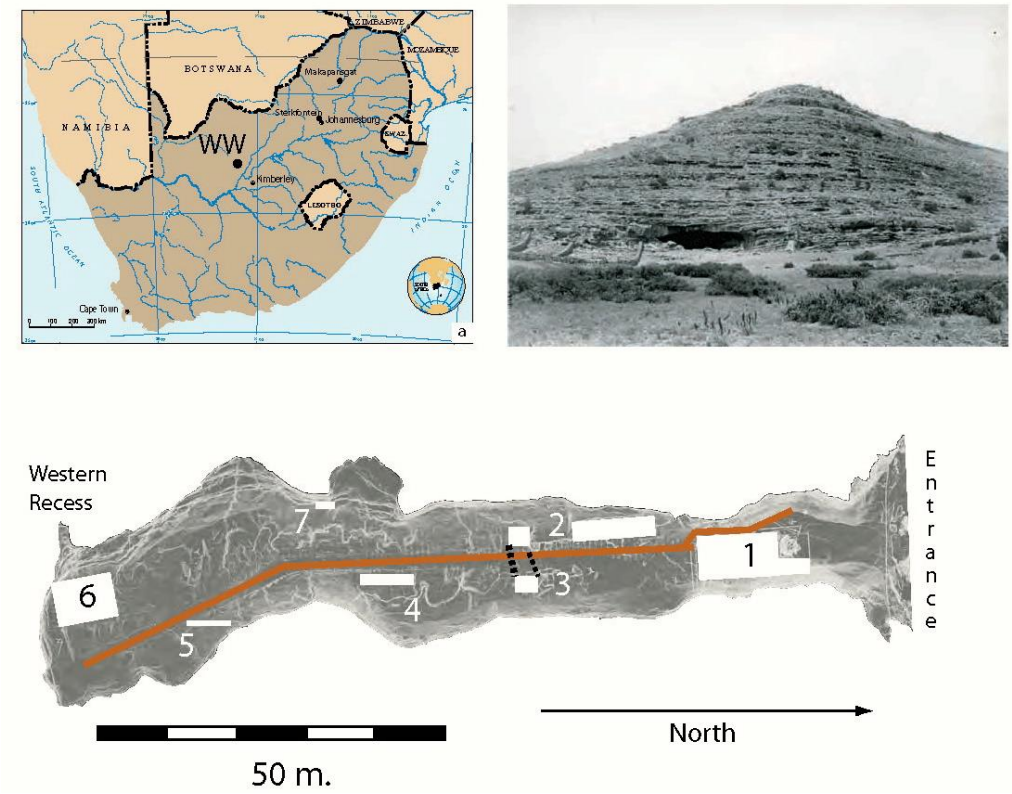


Figure 15: The location of Wonderwerk Cave (top left) and the site itself (top right) with a 3D map of the cavern (below) showing the current boardwalk (from Chazan & Horwitz 2015:254).

Archaeological & Historical Sequence

DATE	DESCRIPTION
2.5 million to 250 000 years ago	The Earlier Stone Age (ESA) is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with more robust flaked tools. It dates to approximately <2 million years ago. The second technological phase is the Acheulian and comprises more refined stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago. A number of important ESA sites are known from the general vicinity, including the very significant ESA Kathu Pan and Kathu Townlands localities and also the Bestwood sites (Chazan et al, 2012) respectively northeast and northwest of the of the study area. Research at Kathu Townlands was first undertaken by

	P.B. Beaumont (1990, 2004). The locality has a remarkable high lithic density containing millions of ESA artefacts (Mitchell, 2002; Walker et al, 2013 Walker et al. 2014). Moreover, the interface between the ESA and MSA is also represented at Kathu Pan by the transitional lithic industry of the Fauresmith (Porat et al 2010).
>250 000 to 40 000 years ago	The Middle Stone Age (MSA) is associated with flakes, points and blades manufactured by means of the prepared core technique. This phase is furthermore associated with modern humans and complex cognition (Wadley 2013). MSA sites and occurrences had been identified in the direct vicinity of the study area, including the very significant Kathu Pan localities (Wilkins & Chazan, 2012). See also, for example, Beaumont (2009) and Kruger (2014).
40 000 years ago to the historic past	The Later Stone Age (LSA) is the third archaeological phase identified and is associated with an abundance of very small stone tools known as microliths. A number of Later Stone Age sites are known from the direct vicinity of the study area. The only site identified during the HIA within the study area is also a LSA Age occurrence (see Section 6 Fieldwork Findings). According to Beaumont (2000) pecked engravings, originally from the farms Sishen 543 and Bruce 544, were donated to the McGregor Museum with some engravings located on the grounds of the Sishen Iron Ore Mine as well. These two farms are situated 5.5km and 3.3km south-west of the study area. More engraving sites are known from further afield including one on the farm Palingpan. This farm is situated roughly 44.7km south of the present study area.
800 AD – 820 AD	The archaeological excavations undertaken by Beaumont and Bashier (1974) and Thackeray et al (1983) have revealed that the mining of specularite at Doornfontein and Tsantsabane/Blinkklipkop commenced during this time. Blinkklipkop for example is located 66.7km south of the study area. During this initial period the mining activities would have been undertaken by San hunter-gatherers and Kora pastoralists. Only after the 17th century were such mining activities likely also undertaken by the Iron Age Tswana groups.

Early 1600s	The Tswana groups known as the Thlaping and Thlaro moved southward into the area presently known as the Northern Cape. A century later they were settled in areas as far south as Majeng (Langeberg), Tsantsabane (Postmasburg) and Tlhaka le Tlou (Daniëlskuil) (Snyman, 1986). In terms of the Thlaro specifically, Breutz (1963) states that after they broke away from the Hurutshe during the period between 1580 and 1610, they travelled along the Molopo River and the Southern Kalahari before arriving at the confluence of the Kudumane, Mosaweng and Molopo. From here they established themselves at Tsowe (west of Morokweng), Gatlhose (10.9km south-east of the study area), Majeng (Langberg), Khoiise (Khuis on the Molopo River) and Tlhaka-la-Tlou (present day Danielskuil situated roughly 72km south-east of the study area). It is evident that the study area and surrounding landscape would be been central within the overall settlement area of the two Tswana groups at the time.
c. 1770	During this time the Kora moved into the area. Due to their superior firearms they applied increasing pressure on the Thlaping and Thlaro groups. In the end the Thlaping moved into a north-eastern direction to settle in the general vicinity of Dithakong, north-east of present-day Kuruman. The Thlaro settled in areas to the west and north-west of the Thlaping (Snyman, 1986).
c. 1786 – c. 1795	The German deserter by the name of Jan Bloem established himself at Tsantsabane (Blinkklip) (Legassick, 2010). This place is located 5km north-east of the present-day town of Postmasburg. The settlement of Jan Bloem at the specularite mine may have been a way in which to control the valuable site and any trading activities associated with it.
c. 1795	Legassick (2010) confirms the presence of the Thlaping, Thlaro and Kora in the general vicinity of the study area during this time. This said the study area and surrounding landscape would have represented a western peripheral area of the overall landscape occupied by especially the Thlaping and Thlaro groups at the time. From a map depicted in Leggassick (2010:338) it is evident that at the time the Kora started moving in north-eastern direction from the areas along the central Orange river to the banks of the Harts River.
Early 1800s	After the threat of the Kora became less intensive, the Thlaping moved to the

	vicinity of present-day Kuruman. The Thlaro returned to the Langeberg, establishing them on a permanent basis there during the 1820s (Snyman, 1986). The settlement of the Thlaping in the vicinity of Kuruman occurred during the reign of Molehabangwe. This period in the history of the Thlaping was seen as a period of wealth and power, and at the time they even had control of the *sibello* quarry near Blinkklip (Legassick, 2010).
1801	The first known visit to this area by European explorers (i.e. excluding European renegades and fugitives such as Jan Bloem) took place in 1801. The journey was undertaken by P.J. Truter and Dr. W. Somerville. They crossed over the Orange River in the vicinity of Prieska, and passed Blinkklip on their way to present-day Kuruman (Bergh, 1999). Although their exact route is not known, it is possible that their journey from present-day Postmasburg to Kuruman would have passed some distance to the east of the present study area.
1802 - 1813	During this year William Anderson and Cornelius Kramer, both of the London Missionary Society, established a mission station at a place called Leeuwenkuil. The focus of their work was a group known as the Bastards (Erasmus, 2004). This group could be described as a cultural conglomeration descending not only from relationships between different cultures and races (i.e. European and Khoi), but also comprised remnants of Khoi and San groups as well as freed slaves. The particular group later became known as the Griqua. Due to the problems caused by the presence of lions at Leeuwenkuil, the mission station was moved in 1805 to Klaarwater. On 7 August 1813 the name of the settlement which had sprung up here was renamed Griquatown. This came about as a result of a number of proposals made by Reverend John Campbell, the Director of the London Missionary Society who was visiting the mission stations from this area at the time. He suggested that "...*the Bastards change their name to 'Griqua' and that Klaarwater became Griquatown. This was because 'on consulting among themselves they found a majority were descended from a person of the name Griqua'*..." (Legassick, 2010). Griquatown is located 129km south of the present study area.

1805	During this year German explorer Martin Hinrich Carl Lichtenstein travelled through the general vicinity of the study area. After crossing the Orange River in the vicinity of present-day Prieska, Lichtenstein's party visited present-day Danielskuil, and by June 1805 they were at Blinkklip (Postmasburg), a well-known source for obtaining specular haematite. Archaeological investigations at Blinkklipkop (also known as Nauga) established a date of AD 800 for the utilization of this particular rich source (Thackeray, et al 1983). From here they travelled further north and reached the Kuruman River where they met Tswana-speaking people. They followed the river downstream for three days, after which they followed a tributary to reach Lattakoe. From here they turned south and reached the Orange River on 11 July 1805. While on his way to the Kuruman River (and to the south thereof), Lichtenstein visited a small settlement consisting of "*…about thirty flat spherical huts.*" Although the people staying here were herdsmen who looked after the cattle of richer people living on the Kuruman River, they indicated that San (Bushmen) were also present in the area (Lichtenstein, 1930). Although Lichtenstein was certainly not the first European explorer to travel through this area (the Truter & Somerville expedition had for example passed through this area in 1801), or for that matter the last (Burchell travelled through the area in 1811 followed by John Campbell in 1813) (Bergh, 1999), Lichtenstein did leave behind a written record of this journey providing a valuable glimpse into the early history of the general surroundings of the study area. What is also significant about the visit of Lichtenstein is that his journey took him from present-day Postmasburg to a place known as Tsenin which is located north-west of Kuruman. As a result he would have passed in close proximity to the present study area.
1813	During 1813 John Campbell of the London Missionary Society also visited the general vicinity of the study area. He arrived at Klaarwater on 9 June 1813, where he rested for a few days before continuing in a northern direction toward present-day Kuruman, passing through Blinkklip on the way (Bergh, 1999).

Figure 16: Reverend John Campbell (Campbell, 1815). He passed through the general vicinity of the study area during his travels from Klaarwater to Kuruman.

20 December 1820	On this day Andries Waterboer was elected as leader of Griquatown in the place of Berend Berends (Legassick, 2010). This period saw fission within the Griqua community, and it is not surprising that two long-term leaders moved away from Griquatown to establish autonomous settlements away from their former town. Berend Berends for example moved to Danielskuil (72km south-east of the study area), whereas Adam Kok II established himself in the vicinity of Campbell (138km south-east of the study area) (Legassick, 2010).
1821 – August 1828	During this period a group of Griqua became dissatisfied with Waterboer and

	moved away from Griquatown to first settle along the Modder River. This group was known as the Bergenaars and was supported by Kora and San elements (Cope, 1977). A section of the Bergenaars known as the Klein Bergenaars (Little Bergenaars) settled along the Langberg. This mountain range is located roughly 35km west of the present study area. The Bergenaars constantly attacked the Thlaro, Thlaphing as well as the Griqua. On three separate occasions (Late 1824, July 1827 and December 1827) they attacked Griquatown itself. They also attacked the London Missionary Society station at Kuruman on several occasions with the last attack taking place in August 1828 (Cope, 1977).
1824	Robert Moffat of the London Missionary Society established the mission station at Kuruman (Erasmus, 2004).
Early 1830s	During this time Andries Waterboer stationed a number of Griqua families at a fountain north of Tsantsabane (Blinkklip) as well as at Danielskuil (Legassick, 2010).
22 April 1842	On this day a treaty was signed between Griqua leader Andries Waterboer and Thlaping leader Mahura at Mahura's settlement near Taungs. The agreement included a definition of the boundary between the two groups. The section of the agreed upon boundary closest to the study area ran from "...*the northerly point of the Langeberg and extending a little south of Nokaneng, and further half-way between Maremane and Klipfontein*..." (Legassick, 2010:291). While the exact location of Nokaneng is not currently known, the farms Klipfontein 437 and Maremane 678 are situated 44.6km and 27.6km to the south. This suggests that the present study area was located north of the boundary line between the Griqua and the Thlaping as defined in the treaty. As such, the study area was defined within this treaty as forming part of the land of the Thlaping. However, it must be noted that this boundary line was not cast in stone. This boundary was very similar to an earlier one that was thought to have been agreed to during the 1820s as a boundary between the Griqua and the Thlaping (Legassick, 2010).

1850	During this time a Thlaro leader by the name of Molete and his baThlaro baga Keakopa followers moved away from the Korannaberg and established themselves at Gathlose, roughly 10.9km south-east of the study area. Breutz (1963) states that the land around Gathlose and Maremane used to belong to the Kora (Koranna) people and that they gave permission to Molete to settle here. After his death between 1885 and 1890, Molete was succeeded by Holele who ruled until his death during the Langberg Rebellion of 1897. Holele was succeeded by Kebiditswe John Holele who filled the post until 1912 when he was succeeded by his younger brother Kgosieng. Kgosieng ruled until he was pensioned on 28 February 1937, and was succeeded by Kebiditswe's son, Kgosietsiele Smous. Kgosietsiele died on 30 June 1956 and was succeeded by his son Frank Motsewakgosi Holele (Breutz, 1963). Likely between 1850 and 1860 the area known as Maremane (located directly north of Gathlose) was an outpost grazing area of the BaThlaro chief Makgolokwe and his son Toto. The first designated leader of this area was Isaak Thupane Thupane, followed by Toto's son Robanyane who fled to present-day Namibia after the Langberg Rebellion of 1897. He was succeeded by his father's brother Jan Molebane Toto. However, the government only recognised him as chief in 1912 up to which point John Holele of the Gathlose Reserve was appointed by the government to act for the Maremane area as well. Molebane was dismissed in 1925 and was succeeded in 1926 by his brother David Makgolokwe. David Makgolokwe remained at his post until his death in 1942 when he was succeeded by Puso Togelo who remained as leader until his death in 1954. He in turn was succeeded by Felix Kgosithebe Toto (Breutz, 1963).
1850 – 1855	During this period a Thlaro chief by the name of Isaak Thupane Thupane established himself at Logageng (Gatkoppies) near Postmasburg. He subsequently moved with his followers to Groenwater 453. During the time that Thupane was living at Logageng, Kgangeng discovered the fountain at Metsematale. Subsequently, the land was ceded by Waterboer to the Thlaro and Kgangeng and his followers settled at Groenwater as well. The farm Groenwater 453 is located 57.9km south-east of the present study area.
13 December 1852	After the death of Andries Waterboer, his son Nicolaas Waterboer became the leader of Griquatown. He ruled Griquatown until the annexation of the area by

	the British in 1871 (see below) (Legassick, 2010). It was during the rule of Nicolaas Waterboer that diamonds were discovered in the area which led to a period of claims and counter-claims between the Griqua, the Orange Free State as well as the Zuid-Afrikaansche Republiek and which eventually led to the annexation of the area.

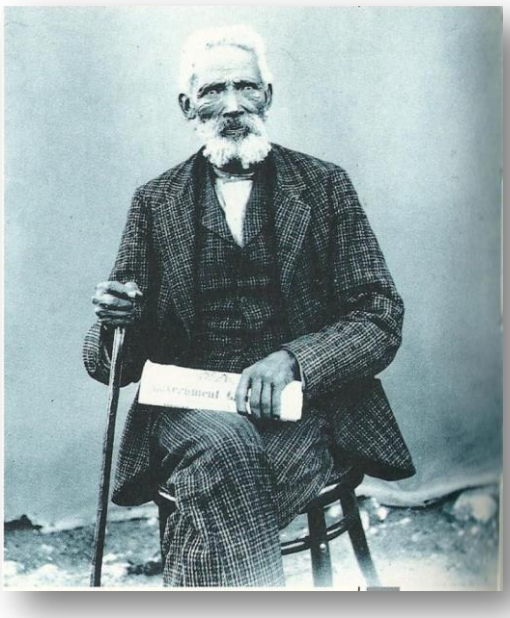
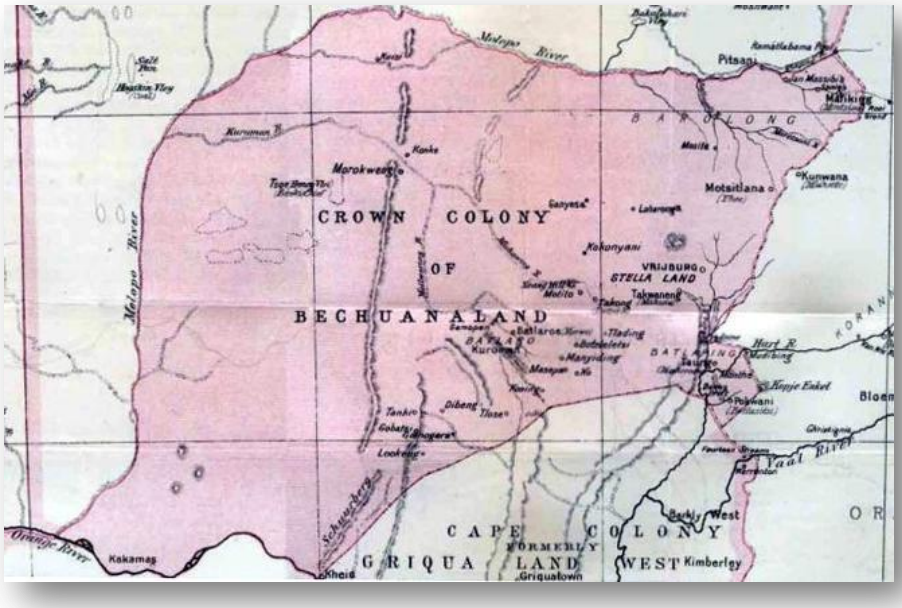


Figure 17: Nicolaas Waterboer, who succeeded as leader of Griquatown in 1852 after the death of his father Andries Waterboer (Reader's Digest, 1994:168).

Before 1856	During the period before 1856 the Thlaro leader Masibi occupied the area known as Skeyfontein, which is located 74.3km south of the study area.
1867	Diamonds were discovered for the first time in South Africa near Hopetown. Alluvial diamonds were also discovered along both banks of the Orange River (Van Staden, 1983).
27 October 1871	The area located in general terms between the Orange and Vaal Rivers and south of Kuruman was proclaimed as British Territory and named Griqualand West (www. wikipedia.org). The study area fell outside and to the north of this territory at the time.

1878	A rebellion broke out amongst some of the Tswana communities living in Griqualand West. This rebellion, which was a response to British expansion and colonialism, spread to the Langberg. A British force left Griqualand West in October 1878 and defeated the "rebels" at the Langberg (Snyman, 1986).
30 September 1885	Sir Charles Warren proclaims the area between the Molopo River and the northern boundary of Griqualand West as the Crown Colony of British Bechuanaland. Its western boundary was defined by the Molopo River and its eastern extremity reached as far as Mafeking. The proclamation followed on a military operation under Warren's command to occupy the Boer Republics of Stellaland and Goosen. As a result the Crown Colony of British Bechuanaland included the lands of the two republics as well as the land of various Tswana groups. (www.wikipedia.org). At the time the study area was located near the southern boundary of this newly proclaimed territory.
 *Figure 18: Section of a map titled "Sketch Map of British Bechuanaland" which is dated to May 1887 (www.wikipedia.com) (www.kaiserscross.com).*	
1886	As a result of the work of a commission appointed by the British rulers of the Crown Colony of British Bechuanaland, a number of so-called "native reserves" were established in this area. These included Deben (19.1km north-west of the

	study area), Gatlhose (11.5km east of the study area), Maremane (27.9km south-east of the study area), Langberg (directly south-west of the farm Sekgame) as well as Kathu (directly west of the farm Sekgame) (Snyman, 1986). The establishment of so many "native reserves" in close proximity to the study area clearly support the suggestion made earlier that the study area was centrally located in the historic and prehistoric territories of Tswana groups such as the Thlaro and Thlaping. In the same year a trader by the name of John Ryan established a shop on the farm Bishop's Wood. This farm is located 12.1km west of the study area.
16 November 1895	The Crown Colony of British Bechuanaland was annexed by the Cape Colony (www.wikipedia.org).
September 1896	During this time a viral disease affecting cattle (and some other species of even-toed ungulates) known as Rinderpest swept through Southern Africa (www.wikipedia.org). Although attempts were made to halt the spread of the disease from the north by erecting a fence between the boundaries of Griqualand West and Bechuanaland, this proved unsuccessful. Incidentally, only three gates were placed in this fence, namely at Gatlhose, Nelsonsfontein and Blikfontein (Snyman, 1988). Of these three places, Gatlhose is the closest and is situated 10.9km south-east of the study area.

Figure 19: An everyday scene during the Rinderpest Epidemic (Snyman, 1983:20).

1897	The Rinderpest epidemic did not only have a massive socio-economic impact on the landsccape, it also resulted in the Langberg Rebellion of 1897. During this time conflict broke out between the authorities and a Thlaping leader from Taung, namely Galeshiwe. The conflict arose after infected cattle belonging to him were destroyed by representatives of the government as a way of kerbing the spread of the disease. After killing an officer, Galishewe fled to the Thlaro leader Toto of the Langberg. Subsequently, a full-scale rebellion broke out (Breutz, 1963). The British authorities eventually mustered a military force which included sections of the Cape Mounted Rifles and Bechuanaland Field Force and which on 14 March 1897 stood at roughly 1,000 men. Opposing this formidable and well equipped force supported by artillery the Tswana rebels possessed an army of roughly 1,500 men who from the start of the rebellion already experienced serious shortages in the way of provisions and ammunitions (Snyman, 1986). Although most of the activities associated with the rebellion took place some distance to the west of the study area, the impact of the rebellion was felt throughout the surrounding landscape. Some noteworthy skirmishes took place on 9 May 1897 at Puduhush (some 31.8km south-west of the study area)

	and on 30 July 1897 at Gamaluse and Gamasep (29.9km west of the study area). Furthermore, the main British force under the overall command of Lieutenant-Colonel E.H. Dalgety used the farm Bishop's Wood as a base of operations (Snyman, 1986). The farm Bishop's Wood is located 11.9km west of the study area. The rebellion was suppressed and came to an end with the surrender of rebel leader Toto, his son Robanyane and their Thlaro followers on 2 August 1897 (Snyman, 1986).

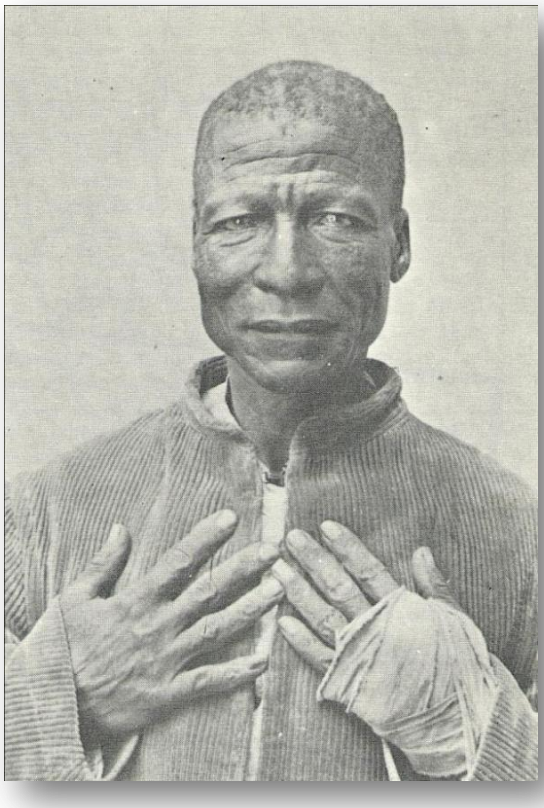


Figure 20: Toto, leader of the Thlaro along the Langberg (Snyman, 1986:17).

1899 - 1902	The South African War was fought between Great Britain and the Boer republics of the Zuid-Afrikaansche Republiek and Orange Free State. However, no skirmishes or battles from this war are known from the direct vicinity of the study area. The closest known battles and skirmishes to the present study area

	include Kareepan on 10 August 1901 and Doornfontein in February 1902 (Snyman, 1983). These farms are located roughly 54km south and 52km south-east of the study area respectively.
1907	A number of trekboers from the southern Free State arrived in the general vicinity of the present study area (Erasmus, 2004).
1913	In this year the so-called "Native Locations" of Skeyfontein and Groenwater were established by Proclamation 131 of 1913 (Breutz, 1963).
1914	The town of Dibeng was laid out in 1914 on the banks of the Ga-Mogara river. This followed on the establishment of the Dibeng Dutch Reformed Church parish in 1909 (Erasmus, 2004).
1927	Gamagara Manganese Corporation Ltd and Central Manganese Ltd obtained options on farms in the vicinity of Lomoteng and Sishen (Snyman, 1988).
4 November 1930	On this day the extension of the railway line from Koopmansfontein to Postmasburg was officially opened by the Minister of Railways, C.W. Malan. This meant that Postmasburg was now one of the few towns in the Northern Cape which boasted a direct rail link. While the extension of the railway line to Beeshoek was built by the Manganese Corporation further extensions to Lohatla and Manganore (1936), Sishen (1953) and Hotazel (1961) were undertaken by the South African Railways (Snyman, 1983).
1930 - 1932	During 1930 an Englishman by the name of Pringle-Smith was appointed by S.A. Manganese to devise and execute a "...*thorough prospecting programme of S.A. Manganese's properties*..." (S.A. Manganese, 1977:46). This meant that the prospecting work undertaken in 1927 and which had been halted due to the poor financial climate and the lack of a railway link could now be proceeded with. Within a relatively short spate of time Pringle-Smith started opening up the beds on the farms Kapstewel and Doornput. However, the company did not have the market which for example the Manganese Corporation possessed at the time, and as a result the ore was stockpiled at these two farms. Pringle-Smith left the Postmasburg area in 1932 after the financial implications of the Great Depression worsened the situation for S.A. Manganese to such an extent that he was asked to agree to a much lower salary (S.A. Manganese, 1977).

Early 1930s	Due to the financial impacts of the Great Depression, a number of smaller manganese mining companies were closed down. A period of amalgamation followed which resulted in the South African Manganese Limited as well as the Associated Manganese Miners of South Africa Limited becoming the leaders in the manganese mining industry (Snyman, 1983).
c. 1932 - 1937	During this approximate period a geological assessment of the minerals and ore deposits of the Postmasburg District was undertaken by the South African Geological Survey. One member of the geological team was Dr. Leslie Gray Boardman. His responsibility was to work on manganese and haematite deposits in the district. Apart from the manganese deposits near Postmasburg, Dr. Boardman also identified large deposits of iron ore deposits on farms along the northern end of their area of study including Sishen, Bruce and King (S.A. Manganese, 1977). These three farms are located 3.4km, 3.5km and 12.9km south of the present study area.

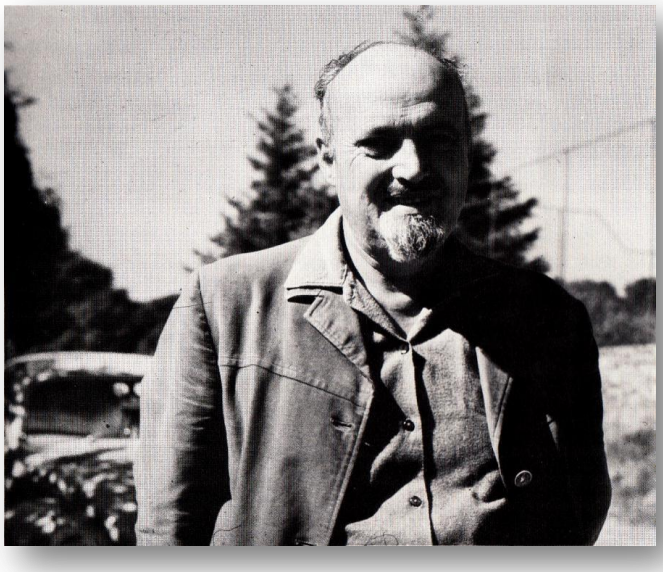


Figure 21: Gr. Leslie Gray Boardman, the geologist who during the 1930s realized the immense potential of the Sishen area for iron ore mining (S.A. Manganese, 1977:65).

c. 1936	After the willingness of the South African Railways Administration to extend the railway line from Postmasburg to Kapstewel and Lohatla became known, the

	entire manganese industry north of Postmasburg changed for the better. An example of this was that S.A. Manganese stepped up operations on the farm Kapstewel. The work here was overseen by Captain T.L.H. Shone (S.A. Manganese, 1977). The promise of railway extensions to this area also resulted in other mining activities such as the establishment of a mining company by the name of Gloucester Manganese. This company was established to mine the manganese deposits on the farm Gloucester. Shortly thereafter an amalgamation took place between Gloucester Manganese and the Manganese Corporation which resulted in the formation of the Associated Manganese Mines of South Africa Limited (Ammosal). Ammosal re-erected the old ore handling plant from Beeshoek on the farm Gloucester and the operations here represented a large portion of the total manganese production of 250,000 tons (S.A. Manganese, 1977). The farm Gloucester is situated 36.5km south of the study area.
1937	The farm to the east of Gloucester, named Lohatla, was now being viewed more favourably by S.A. Manganese. During this year they reached an agreement with the owner, which eventually resulted in the acquisition of the farm (S.A. Manganese, 1977). During the same year the company bought the freehold of the farm Klipfontein and also bought 600 morgen of the farm Kapstewel in order to build a staff village. This village was named Manganore (S.A. Manganese, 1977). The Lohatla mine village was also established during this time (Snyman, 1983). Furthermore, the African Metals Corporation Limited (Amcor) was established "*…to manufacture semi-processed iron and steel products*…" and in 1937 obtained the farm Demaneng for this purpose. However, this venture was a failure (Snyman, 1988:84). The farm Demaneng is located 8.1km south-east of the study area.
Late 1940s	During this time the decision was made by two of the bigger role players in the manganese mining industry around Postmasburg for the mining of haematite iron ore to commence in earnest. S.A. Manganese in conjunction with the African Metals Corporation (Amcor) established a new company known as Manganore Iron Mining Ltd. to work on the iron ore deposits owned by them. These deposits were *inter alia* located on the farms Klipfontein, Kapstewel and Doornput (S.A. Manganese, 1977). All three these farms are located roughly

	45km south of the present study area.
c. 1950	At the time Dr. L.G. Boardman was assessing the ore reserves at Manganore and Lohathla as well as the farm Lilyveld for S.A. Manganese. He found that the latter farm contained large quantities of haematite iron ore and persuaded the directors of S.A. Manganese to acquire the farm (S.A. Manganese, 1977). The farm Lilyveld is situated directly south and adjacent to the farm Sekgame and is roughly 5.1km south of the study area.
1953	Iscor commenced iron production at Sishen (Snyman, 1983). In the same year the railway line from Postmasburg to Sishen was extended to haul ore to Iscor's plants in Pretoria, Vanderbijlpark and Newcastle (Erasmus, 2004).
1958	At least by 1958 Manganore Iron Mining also owned mineral and surface rights on the farm Sekgame. The study area is of course located on this farm.
1973	In this year a second mine was opened at Sishen to supply export iron ore to Saldanha Bay. During the same year the town of Kathu was established to accommodate employees for the new mine (Erasmus, 2004).
1976 - 1977	During this time the Gatlhose and Maremane Communities were removed from their land and taken to the Shipton Farms in the then homeland of Bophutatswana. After their removal, the South African Government decided to establish a Battle School here. As the Khosis Community was still staying on the land, they were moved to a section of the original land roughly 14 000 hectares in extent. The Lohatla Battle School was subsequently established (www.lrc.org.za/Docs/Judgments/khosis.doc).
1977	During this year the 860km long Sishen-Saldanha railway line was completed (Erasmus, 2004).
1980	In 1980 the town of Kathu received municipal status (Erasmus, 2004).

5 HERITAGE SITES

During the survey a total of 13 find spots [1], 1 site[2]., 2 cemeteries, 2 quarries, 7 structures and one anti-erosion wall were located. along the proposed Mothibistad substation - Sekgame switching station alignment

Most of the area is characterised by a Kalahari Sand substrate, making finds in this zone susceptible to post-depositional movement (vertical and horizontal). Since much of the area is used for cattle ranching the archaeological finds are subjected to modern trampling. There is also intensive aardvark, ground squirrel, scrub hare, warthog and springhare burrowing in the area.

Unsure of nearest source of stone material. Little to no CCS was noted, very little quartz and quartzite and some dolerite.

The higher areas are generally quite rocky with the low-lying flats characterised by Kalahari Sands, open shrub and woodland and occasionally erosional dongas. In the Kalahari Sands very little archaeological remains were noted likely due to post-depositional alterations.

[1] Can be classified as an area where only a single artefact or low density of artefacts occurs. The absence of associated material or artefacts that indicate a temporal shallow or ephemeral occupation

[2] The association of numerous artefacts or structures and /or cultural deposits that all combine to indicate a temporal depth and information to a site.

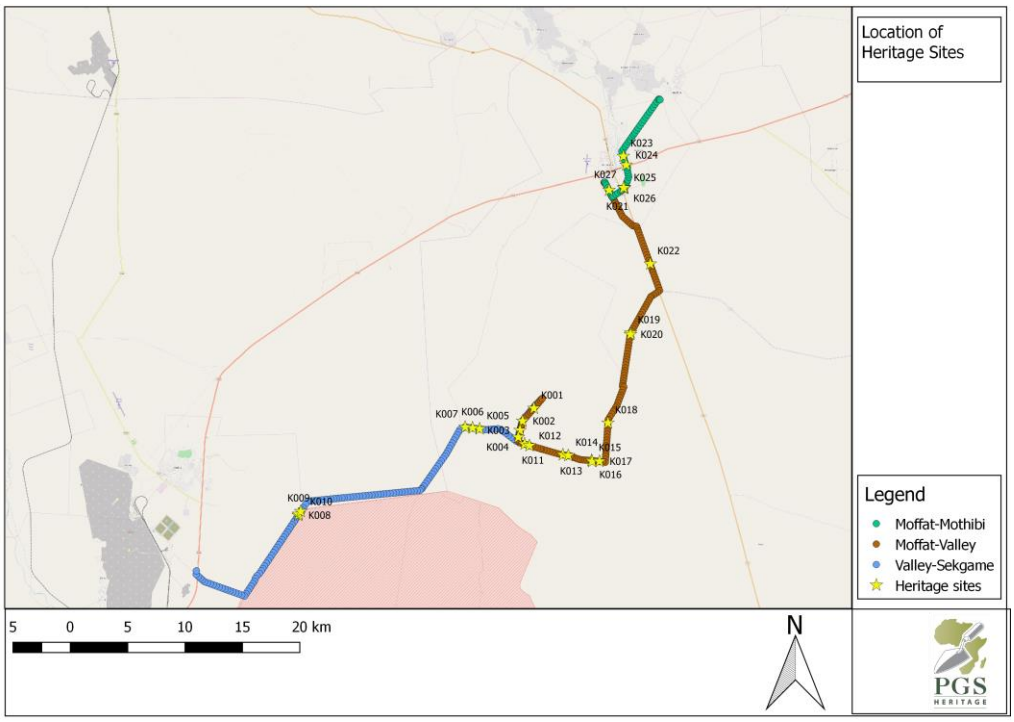


Figure 22: Location of Heritage sites

5.1 Moffat Substation to Mothibistad Substation

A total of 6 sites were located along this section. One find spot, one archaeological site, and four structures. The structures do not appear on the historical maps and therefor believed to be younger than 60 years and not protected.

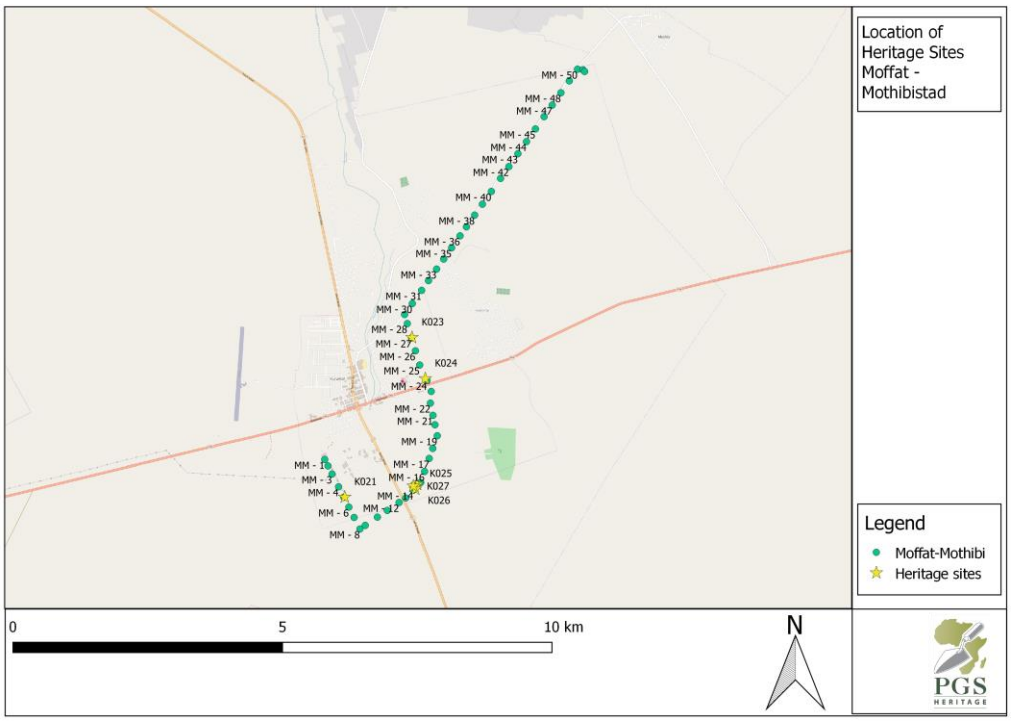


Figure 23: location of heritage sites on the Moffat Mothibi line

5.1.1 K 021 Find spot

Coordinate: -27.478582°, 23.431625°

Closest Pylon: Pylon MM5 is approximately 16m to the west of this identified site.

Grading: Low significance

5.1.2 K023 Stone Age manufacture site

Coordinate: -27.452002°, 23.444257°

Closest Pylon: Plyon MM 27 occurs within the heritage site

Site size: Approximately 80m-50m in diameter.

Grading: Generally Protected A (GP.A). It is medium to low significance.

Description: Description: High density MSA scatter (±80x50m) situated around a dolerite outcrop. Appears to be a primary manufacturing site. The site is located in a red sand but rocky substrate that appears to be particularly shallow and subject to slight erosion. The site is on a rock outcrop in a flat region in open shrub woodland. Little animal activity was recorded and some human activity was noted, mostly people moving between the town of Kuruman and the outlying township.

Management:

- Demarcate the site as a no go area, with a 20-meter buffer.
- The site must be monitored during construction.
- The pylon should be moved at least 20 m west of the site.
- Alternatively, the site should be mitigated where a surface collection takes place if the site cannot be avoided.

Figure 24: General view of the identified site

Figure 25: View of the general scatter found across the site.

5.1.3 K024 Abandoned structure

Coordinate: -27.458854°, 23.446749°

Closest Pylon: MM24 is about 30 m from the site

Site size: Approximately 10m-20m in diameter.

Grading: Low significance, no heritage grading.

Management: None

Description: Description: Old abandoned buildings. Mostly broken with no roof remains, door and window frames. The site appears to be occupied by vagrants. The site is located in a red sand but rocky substrate that appears to be particularly shallow and subject to slight erosion. The site is in a flat region in open shrub woodland. Little animal activity was recorded and as mentioned vagrants appear to be using the site. It is also in the area which sees people travelling between Kuruman and the township.

Figure 26: General view of the identified site .

Figure 27: View of abandoned buildings

5.1.4 K025, K026, K027: Existing structures

Coordinate: -27.476470°, 23.445207°; -27.477245°, 23.444876°; -27.476738°, 23.444502°

Closest Pylon: MM14 is about 70 m from the cluster of sites

Site size: Approximately 140m-120m in diameter.

Grading: Low significance, no heritage grading.

Management: None.

Description: K025 - Two buildings, one appears old (last few decades) and the other may still be occupied. The older building is fairly damaged with no roof, doors or windows whereas the other may still house people. The site is located in a Kalahari Sand substrate that appears to be fairly deep and subject to slight erosion. The site is in a flat region in open woodland. Little animal activity was recorded and recent human activity was noted.

K026 and K027 - Large amounts of brick debris. Some are cemented together in large clumps. The debris is spread over a large area (±140x120m) and there is no discernible centre or structure (ie possible buildings). Also present is melted glass, historic porcelain and a single pile of modern bricks. The isolated clusters of brick debris may be dumping sites for the nearby brick yard (with the pile representing degraded brick) or from separate brick kilning episodes (possibly explaining the melted glass found on site). The site is located in a Kalahari Sand substrate that appears to be fairly deep and subject to slight erosion. The site is in a flat region in open woodland. Little animal activity was recorded and recent human activity was noted.

Comment [WF1]: Keep the formatting consistent

Figure 28: General view of the identified structures at K025

Figure 29: General view of structures at K025

Figure 30: View of the brick piles at K026.

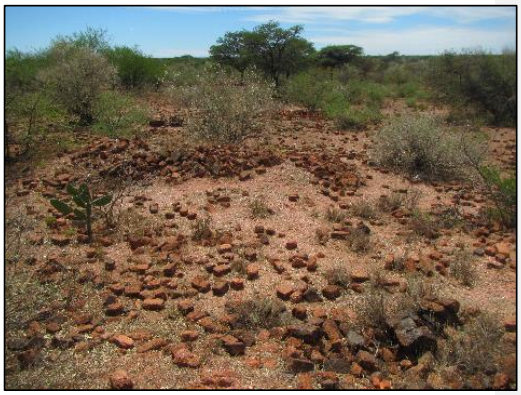


Figure 31: Scatters of bricks at K027

5.2 Moffat Substation to Valley Substation

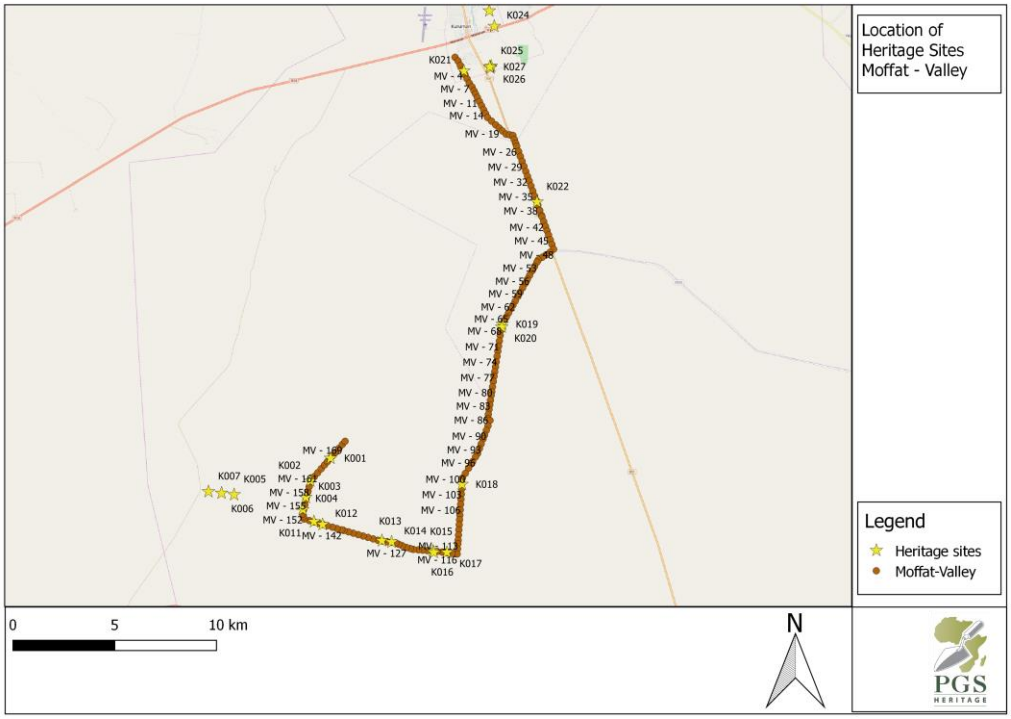


Figure 32: Location of heritage sites Moffat-Valley line

5.2.1 K001 Find spot

Coordinate: -27.649536°, 23.365137°

Closest Pylon: Pylon MV 165 is approximately 20m to the SW of this identified site.

Grading: Low significance.

Description: A low density stone tool scatter was identified in a donga (heavily disturbed and eroded). The material used was a fine-grained quartzite. No diagnostic artefacts were identified making it difficult to be certain about the chronology.

5.2.2 K002 Find spot

Coordinate: -27.659539°, 23.355107°

Closest Pylon: Pylon MV159 is approximately 8m to the east of this identified site.

Grading: Low significance.

Description: MSA find spot. A scraper was all that was identified. Located in a rocky substrate that is probably fairly shallow and has seen slight erosion. The find spot is situated on a small hilltop in a

mixed woodland environment set upon an undulating landscape. The find spot has been subjected to animal trampling and is near a road but otherwise with little human interference.

5.2.3 K011 Find spot

Coordinate: -27.677533°, 23.356889°

Closest Pylon: Pylon MV148 is approximately 10m to the east of this identified site.

Grading: Low significance.

Description: A scraper was identified. The substrate is rocky and shallow with slight erosion. The site is located in a mixed woodland environment set upon an undulating landscape. The site has been subjected to animal trampling and is near a road but otherwise with little human interference.

5.2.4 K012 Find spot

Coordinate: -27.678779°, 23.361181°

Closest Pylon: Pylon MV146 is approximately 10m to the north of this identified site.

Grading: Low significance.

Description: A single utilized flake was identified. The substrate is rocky and shallow with slight erosion. The site is located in a mixed woodland environment set upon an undulating landscape. The site has been subjected to animal trampling and is near a road but otherwise with little human interference.

5.2.5 K015 Find spot

Coordinate: -27.690443°, 23.416112°

Closest Pylon: Pylon MV121 is approximately 25m to the west of this identified site.

Grading: Low significance.

Description: A single scraper was identified. The substrate is rocky and shallow with slight erosion. The site is located in a mixed woodland environment set upon an undulating landscape. The site has been subjected to animal trampling and is near a road but otherwise with little human interference.

5.2.6 K018 Find spot

Coordinate: -27.661040°, 23.430657°

Closest Pylon: Pylon MV102 is approximately 80m to the north of this identified site.

Grading: Low significance.

Description: A MSA scraper and core rejuvenation flake were identified in an erosional gully. The scatter appear to be over a large area and most likely was eroded from further up the hill-slope and migrated downwards. Located in a consolidated Kalahari Sand (or red/brown) substrate that appears to be fairly deep and subjected to considerable erosion. The site is located around a hill in hilly area characterised by shrub woodland. Animal trampling and no human interference was recorded.

5.2.7 K014 Abandoned structure

Coordinate: -27.686486°, 23.395565°

Closest Pylon: MV131 is about 20 m SW from the site

Site size: Approximately 10m-20m in diameter.

Grading: Low significance. No heritage grading.

Management: None

Description: Description: Abandoned building. A single structure occurs here, probably a labourer cottage. The structure is no longer in use.

Figure 33:Identified structure.

5.2.8 K016 Abandoned structure

Coordinate: -27.691073°, 23.416641°

Closest Pylon: MV121 is about 80 m from the site

Site size: Approximately 50m in length.

Grading: Low significance. No heritage grading.

Management: None

Description: Remains of anti-erosion walls which can also be seen on the 1972 historical Topographic maps.

Figure 34:Remains of anti-erosion walls.

Figure 35: Remains of anti-erosion walls

5.2.9 K017 Foundation

Coordinate: -27.691066°, 23.423159°

Closest Pylon: MV118 is about 20m SE from the site.

Site size: Approximately 10m-10m in diameter.

Grading: Low significance.

Management: None

Description: The remains of a small stone build structure occur at this position. Very little of the structure remains other than the foundation. The remains occur within 10-15 m from the dirt road.

Figure 36: Remaining foundation.

Figure 37: remaining foundation

5.2.10 K019 Historic structure

Coordinate: -27.590395°, 23.450690°

Comment [WF2]: Coordinate?

Closest Pylon: MV68 is about 50 m south from the site

Site size: Approximately 10m-20m in diameter.

Grading: Medium to Low significance. Generally Protected B (GP.B).

Management:

- Demarcate the site as a no go area, with a 20-meter buffer.
- The site must be monitored during construction.
- Recording of the structure before destruction if the building is to be destroyed or disturbed.

Description: Two existing buildings. One appears very modern but the other (and larger) appears older. It may be part of an earlier colonial settlement of the region but its exact chronology could not be established. The building has a large assemblage of recent material scattered around it such as glass, metal and porcelain. The older building is damaged with collapsed walls, windows and door frames and no remains of the roof. The buildings are located in an unconsolidated Kalahari Sand (or red/brown) substrate (possibly also clay) that appears to be fairly deep and subject to slight erosion. The site is in a drainage area in a hilly region in open woodland. Evidence of trampling and burrowing was recorded as well as more recent human interference. The older structure does occur on the 1974 historical topographic map, the construction material and techniques indicate a structure older than 60 years.

Figure 38: Recent structure.

Figure 39: View of remains oh historic structure.

Figure 40: View of the internal structures of the historic building.

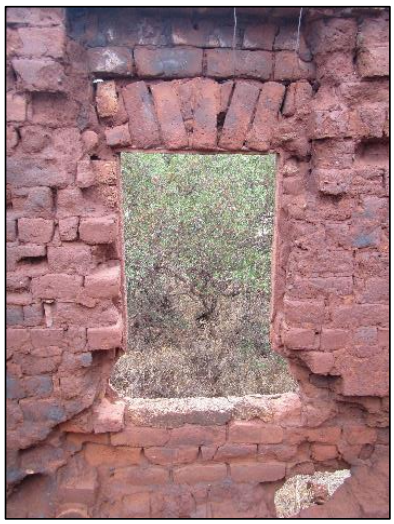


Figure 41: View of Window frame.

5.2.11 K013 Graves

Coordinate: -27.685899°, 23.390736°

Closest Pylon: MM133 is about 25 m east from the site

Site size: Approximately 10m-10m in diameter.

Grading: High significance. Generally protected A.

Management:

At least 9 graves are located about 20m W of MV133. A 20 m buffer should be placed around the graves and they should be fenced off, if the pylon position can not be moved. It is also recommended that the ECO be present during construction at this location

Description: Approximately 9 stone packed graves oriented in an east west direction occur at this location.

Figure 42: Graves.

Figure 43: Close up of graves at K013

5.2.12 K020 Graves

Coordinate: -27.591653°, 23.450499°

Closest Pylon: MV68 is about 80 m, N from the site

Site size: Approximately 5m-5m in diameter.

Grading: High significance. Generally Protected A (GP.A)

Management:

At least 9 graves are located about 20m W of MV133. A 20 m buffer should be placed around the graves and they should be fenced off, if the pylon position can not be moved. It is also recommended that the ECO be present during construction at this location

Description: Two graves situated behind the older of the two houses identified at K019. These graves may be associated with the occupation of the house or post-date its construction (the house may have been reoccupied at a later stage). That no other graves were identified does not preclude the possibility that more are in the area. The graves are located in an unconsolidated Kalahari Sand (or red/brown) substrate (possibly also clay) that appears to be fairly deep and subject to no erosion. The site is in a drainage area in a hilly region in dense shrub woodland. Evidence of trampling was recorded as well as more recent human interference including a nearby road and the placement of acacia branches over the graves (therefore, people still visit the site). These graves occur just outside the study area and will probably not be affected.

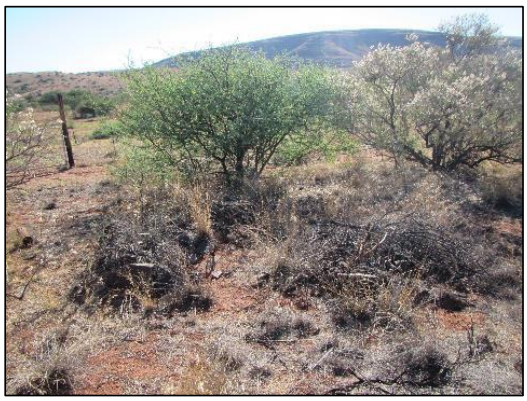


Figure 44: view of two graves at K020 .

Figure 45: Showing vegetation covering graves, which was put there recently.

5.3 Valley Substation to Sekgame Substation

5.3.1 K003 Find spot

Coordinate: -27.666841°, 23.352825°

Closest Pylon: Pylon VS 14 is approximately 35m to the north of this identified site.

Grading: Low significance.

Description: Low density MSA scatter possibly over a large area. A scraper and a flake were identified. The substrate is rocky and shallow with slight erosion. The site is located on a slight hilltop in a mixed woodland environment set upon an undulating landscape. The site has been subjected to animal trampling and is near a road but otherwise with little human interference.

5.3.2 K004 Find spot

Coordinate: -27.672177°, 23.351308°

Closest Pylon: Pylon VS 16 is approximately 70m to the north of this identified site.

Grading: Low significance.

Description: MSA scraper find spot. Located in the excavated mound in front of an aardvark burrow and was probably brought up from lower down. The find spot is in a Kalahari Sand horizon which appears to be quite deep based on the burrow. Slight erosion has affected the find spot. The tool was identified between koppies on an undulating landscape characterised by mixed woodland. Obviously, large animal burrowing has affected the site but there is no evidence of human interference.

5.3.3 K005 Find spot

Coordinate: -27.665602°, 23.317080°

Closest Pylon: Pylon VS 31 is approximately 20m to the SW of this identified site.

Grading: Low significance.

Description: MSA biface find spot. Located in a Kalahari Sand horizon which appears to be quite deep. Slight erosion has affected the find spot. The tool was identified between koppies on an undulating landscape in dense shrub woodland. Animal trampling was recorded but there is no evidence of human interference.

5.3.4 K006 Find spot

Coordinate: -27.664910°, 23.310846°

Closest Pylon: Pylon VS 33 is approximately 60m to the east of this identified site.

Grading: Low significance.

Description: A possible ESA chopper find spot. Located in a Kalahari Sand horizon which appears to be quite deep. Slight erosion has affected the find spot. The tool was identified between koppies on an undulating landscape in dense shrub woodland. Animal trampling was recorded but there is no evidence of human interference.

5.3.5 K007 Find spot

Coordinate: -27.664265°, 23.304308°

Closest Pylon: Pylon VS 36 is approximately 30m to the west of this identified site.

Grading: Low significance.

Description: A partially made handaxe or biface find spot. Located in a rocky substrate that appears to be shallow with slight erosion. The tool was identified between koppies on an undulating landscape in dense shrub woodland. Animal trampling was recorded but there is no evidence of human interference.

5.3.6 K009 Find spot

Coordinate: -27.732374°, 23.156998°

Closest Pylon: Pylon VS 106 is approximately 100m to the south of this identified site.

Grading: Low significance.

Description: Single core identified at this find spot but it indicates some form of knapping (stone tool production) took place here. This may be a primary knapping site where the core was initially knapped or it may have been brought to this vantage point (overlooking the flats below) and knapped. Located in a rocky substrate that appears to be shallow with slight erosion. Located in a rocky substrate that appears to be shallow with slight erosion. The find spot is on a hilltop on an undulating landscape in an open shrub woodland. No clear evidence of animal disturbance and human interference was noted.

5.3.7 K009 and K010 Quarries

Coordinate: -27.733246°, 23.156596°; -27.730261°, 23.158811°

Closest Pylon: Pylon VS 106 is approximately 10m to the SE of K008 and VS 105 is approximately 100m south of K010

Grading: Low significance.

Description Initially it was thought that these pits may be old prospecting excavations but it was then felt that they were more likely quarries. Bedding rocks appear to have been the goal and many were noted at each quarry. The rocks appear ideal for construction because of their flat top and bottom faces, which assisted with the conclusion. At this point six were recorded but others outside of the servitude were also noted. Located in a rocky substrate that appears to be shallow with slight erosion. The quarries are on a hilltop on an undulating landscape in an open shrub woodland. No clear evidence of animal disturbance and human interference was noted.

Figure 46: Quarrying at K008

Figure 47: Quarrying at K010

6 ASSUMPTIONS AND LIMITATIONS

Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover in some areas. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time as the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development the procedures and requirements pertaining to graves and burials will apply as set out below.

7 ASSESSMENT AND RECOMMENDATIONS

During the survey a total of 13 find spots [3], 1 site[4]., 2 cemeteries, 2 quarries, 7 structures and one anti-erosion wall were located along the proposed Mothibistad substation - Sekgame switching station alignment.

[3] Can be classified as an area where only a single artefact or low density of artefacts occurs. The absence of associated material or artefacts that indicate a temporal shallow or ephemeral occupation

[4] The association of numerous artefacts or structures and /or cultural deposits that all combine to indicate a temporal depth and information to a site.

The overall management of heritage resources must lean towards the conservation of the resource *in situ* and as such to the demarcation of such sites as "no-go" areas during construction.

However, where the cost implication and socio-economic implications outweigh such an option, the next option would be mitigating the impact on the resource by means of the documentation of the site through sampling / surface collections, and in some cases controlled excavations, to collect a representative sample for further study of the site.

All other identified heritage resources must be demarcated as no-go areas during construction, and monitored during and upon completion of construction for damage.

Site Number	Description	Coordinates	Management Measures
K013	Cemetery near MV133	-27.685899°, 23.390736°	• Demarcate the site as a no go area, with a 20-meter buffer and a fence. • It is also recommended that the ECO be present during construction at this location. • If the graves will be disturbed in any way and a buffer is not possible, a grave relocation process will need to take place
K019	Historic structure near MV68	-27.590395°, 23.450690°	• Demarcate the site as a no go area, with a 20-meter buffer. • The site must be monitored during construction • Recording of the structure before destruction if the building is to be destroyed or disturbed
K020	Cemetery near MV68	27.591653°, 23.450499°	At least 9 graves are located about 20m W of MV133. A 20 m buffer should be placed around the graves and they should be fenced off, if the pylon position can not be moved. It is also recommended that the ECO be present during construction at this location

K023	Stone Age Site near MM27	-27.452002°, 23.444257°	• Demarcate the site as a no go area, with a 20-meter buffer. • The site must be monitored during construction. • The pylon should be moved at least 20 m west of the site. • Alternatively, the site should be mitigated where a surface collection takes place if the site cannot be avoided.

lists the sites and associated pylon numbers and management recommendations.

Table 4: Sites and associated pylon numbers and management

Site Number	Description	Coordinates	Management Measures
K013	Cemetery near MV133	-27.685899°, 23.390736°	• Demarcate the site as a no go area, with a 20-meter buffer and a fence. • It is also recommended that the ECO be present during construction at this location. • If the graves will be disturbed in any way and a buffer is not possible, a grave relocation process will need to take place
K019	Historic structure near MV68	-27.590395°, 23.450690°	• Demarcate the site as a no go area, with a 20-meter buffer. • The site must be monitored during construction • Recording of the structure before destruction if the building is to be destroyed or disturbed
K020	Cemetery near MV68	27.591653°, 23.450499°	At least 9 graves are located about 20m W of MV133. A 20 m buffer should be placed around the graves and they should be fenced off, if the pylon position can not be moved. It is also recommended that the ECO be present during

			construction at this location
K023	Stone Age Site near MM27	-27.452002°, 23.444257°	• Demarcate the site as a no go area, with a 20-meter buffer. • The site must be monitored during construction. • The pylon should be moved at least 20 m west of the site. • Alternatively, the site should be mitigated where a surface collection takes place if the site cannot be avoided.

7.1 Heritage Management Plan for EMP implementation

NO.	MITIGATION MEASURES	PHASE	TIMEFRAME	RESPONSIBLE PARTY FOR IMPLEMENTATION	MONITORING PARTY (FREQUENCY)	TARGET	PERFORMANCE INDICATORS (MONITORING TOOL)	COST
Possible finds								
A	Implement chance find procedures in case where possible heritage finds area made	Construction	During construction	Applicant ECO Heritage Specialist	ECO (weekly)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report	**Possibly R50 000**
Known sites								
K013	• Demarcate the site as a no go area, with a 20-meter buffer and a fence. • It is also recommended that the ECO be present during construction at this location. • If the graves will be disturbed in any way and a buffer is not	Construction	During construction	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report	**Less than R10 000**

	possible, a grave relocation process will need to take place							
K019	▪ Demarcate the site as a no go area, with a 20-meter buffer. ▪ The site must be monitored during construction ▪ Recording of the structure before destruction if the building is to be destroyed or disturbed	Construction	During construction	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report	**Less than R10 000**
K020	• A 20-meter buffer should be placed around the graves and they should be fenced off, if the pylon position cannot be moved. • It is also recommended that the ECO be present during construction at	Construction	During construction	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report	

	this location. ▪ If the graves will be disturbed in any way and a buffer is not possible, a grave relocation process will need to take place							
K23	• Demarcate the site as a no go area, with a 20-meter buffer. • The pylon should be moved at least 20 m west of the site. ⌖ Alternatively, the site should be mitigated where a surface collection takes place if the site cannot be avoided.	Construction						

8 IMPACT MANAGEMENT

8.1 Pre-construction phase

Pre-construction measures are required. This will include consultation with the community and the demarcation of identified heritage sites.

8.2 Construction phase

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camps area and small-scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during operations and may be recoverable, but this is the high-cost front of the operation, and so any delays should be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, but construction trenches do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project and these must be catered for. Temporary infrastructure is often changed or added to the subsequent history of the project. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. A responsible archaeologist must be appointed for this commission. This person does not have to be a permanent employee, but needs to sit in at relevant meetings, for example when changes in design are discussed, and notify SAHRA of these changes. This archaeological monitoring and feedback strategy should be incorporated into the Environmental Management Plan (EMP) of the project.

Should an archaeological site or cultural material be discovered during construction (or operation), such as stone walling, stone artefacts, burials or grave sites, the project needs to be able to call on a qualified expert to make a decision on what is required and if it is necessary to carry out emergency recovery. SAHRA would need to be informed and may give advice on procedure. The developers therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the material and data are recovered. The project thus needs to have an archaeologist available to do such work.

The purpose of an archaeological monitoring programme is to provide general information to the developer with regards to management recommendations and cost estimates for the archaeological component, a specialist sub-section of the Environmental Impact Assessment (EIA) process, for the project.

Such a monitoring programme is planned for observation and investigation during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land where there is a possibility that archaeological/palaeontological deposits may be disturbed or destroyed. Its main purpose is:

- To allow, within the resources available, the preservation by record of archaeological /palaeontological deposits, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development or other potentially disruptive works;
- To provide an opportunity, if needed, for the monitoring archaeologist/palaeontologist to signal to all interested parties, before the destruction of the material in question, that an archaeological/palaeontological find has been made for which the resources allocated to the monitoring programme itself are not sufficient to support treatment to a satisfactory and proper standard; and
- A monitoring programme is not intended to reduce the requirement for excavation or preservation of known or inferred deposits, and it is intended to guide, not replace, any requirement for contingent excavation or preservation of possible deposits.

In essence, the objective of a monitoring programme is to establish and make available information about the archaeological/palaeontological resource existing on a site.

Contact details for the **South African Heritage Resources Authority – Archaeology, Palaeontology and Meteorites Unit:**

Tel: 021 462 4502

Address: 111 Harrington Street, PO Box 4637, Cape Town 8000, South Africa

8.3 Timeframes

It must be kept in mind that mitigation and monitoring of heritage resources during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 5** gives guidelines for lead times on permitting.

Table 5: Lead times for permitting and mobilisation

ACTION	RESPONSIBILITY	TIMEFRAME
Preparation for field monitoring and finalisation of contracts	The contractor and service provide	1 months
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	1 month
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of cemetery or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

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Historic Topographic Maps

All the historic topographic maps used in this report were obtained from the Directorate: National Geo-Spatial Information of the Department of Rural Development and Land Reform in Cape Town.