AGES LIMPOPO: PROPOSED BISMARCK DAM & PIPELINES EIA PROJECT ON BISMARCK 116MS, KONINGSMARK 117MS, SKUTWATER 115MS & WEIPE 47MS, VHEMBE DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

Archaeological Impact Assessment

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ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE DEVELOPMENT OF A DAM ON THE FARMS BISMARCK 116 MS & KONINGSMARK 117 MS AND CONNECTING PIPELINES ON BISMARCK 116 MS, SKUTWATER 115 MS & WEIPE 47 MS IN THE WEIPE AREA, VHEMBE DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

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DECLARATION

I, Nelius Le Roux Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Bismarck Dam & Pipelines EIA Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA, AMAFA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.

Signature of specialist
Company: Exigo Sustainability
Date: 5 March 2021

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study subject to an Environmental Impact Assessment (EIA) process for the proposed Bismarck Dam & Pipelines EIAProject on Bismarck 116MS, Koningsmark 117MS, Skutwater 115MS & Weipe 47MS in the Vhembe District Municipality of the Limpopo Province. The proposed project entails the construction of a dam with a storage capacity of 15 000 000 cubic metres which will cover 170 hectares as well as and three 630 mm pipelines to fill the dam from the Limpopo River. The main purpose of the HIA was to illustrate the potential impact (direct and indirect as well as short and long-term impacts) of the proposed Bismarck Dam & Pipelines EIA Project on the "Outstanding Universal Value" (OUV) of the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) as determined by UNESCO. The report includes background information on the area's archaeology, its representation in Southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

Project Title	Bismarck Dam & Pipelines EIA Project
Project Location	Bismarck Dam Relative Midpoint S22.16390° E29.60866° Pipeline Southern Offset S22.16146° E29.60837° Pipeline Southern Offset S22.17101° E29.61797°
1:50 000 Map Sheet	2229BA, 2229BC
Farm Portion / Parcel	Bismarck 116MS, Koningsmark 117MS, Skutwater 115MS & Weipe 47MS
Magisterial District / Municipal Area	Vhembe District Municipality
Province	Limpopo Province

The Mapungubwe Cultural Landscape (MCL) is universally significant for its Iron Age Farmer archaeology relating to State Formation in Iron Age Farmer communities of southern Africa. The MCLWHS contains about 400 archaeological sites in the core area, some of which provide evidence for the evolution of the state of Mapungubwe between AD 900 and 1300. The MCL was declared a World Heritage Site in 2003 on the basis of the following OUV's:

- Criterion (ii): The Mapungubwe Cultural Landscape contains evidence for an important interchange of human values that led to far-reaching cultural and social changes in Southern Africa between AD 900 and 1300.

- Criterion (iii): The remains in the Mapungubwe Cultural Landscape are a remarkably complete testimony to the growth and subsequent decline of the Mapungubwe State which at its height was the largest kingdom in the African subcontinent.

- Criterion (iv): The establishment of Mapungubwe as a powerful state trading through the East African ports with Arabia and India was a significant stage in the history of the African sub-continent.

- Criterion (v): The remains in the Mapungubwe cultural landscape graphically illustrate the impact of climate change and record the growth and then decline of the Kingdom of Mapungubwe as a clear record of a culture that became vulnerable to irreversible change.

The Bismarck project landscape is similarly rich in Middle Iron Age sites such as the Skutwater site which bears testimony to the earliest known state society in Southern Africa (AD 900-1300). The Bismarck project area occupy a key spatial position in the geopolitical world of the Middle Iron Age Limpopo Valley, where it straddles the zone of interaction between the wider hinterland and the Mapungubwe heartland. As a consequence, the project lies within the Buffer Zone of the MCLWHS and developments within this buffer have implications for the World Heritage Site status and the Outstanding Universal Values (OUVs) of the MCLWHS. Cognisant thereof, the following recommendations are made based on general observations in the proposed Bismarck Dam & Pipelines EIA Project in terms of heritage resources management.

- Stone Age remains occur abundantly in the Limpopo landscape and the field assessment located 2 predominantly Middle Stone Age (MSA) localities (**EXIGO-BIS-S1, EXIGO-BIS-S2**) in project area. These localities are of medium significance and the sites should be mitigated prior to impact, including a detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the archaeology of the region. A mitigation methodology should be developed based on an understanding of the archaeology and history of the broader region and this should be followed by the recording and surface and subsurface sampling of the Stone Age localities by a qualified Stone Age Specialist. Artefact samples should be analysed and it is essential that this measure culminate in the publication of research findings. Mitigation of these localities should be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage authorities. Generally, the sites should be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains.
- The remains of the Bismarck farmstead dating to the Historical Period (**Exigo-BIS-H1**) are poorly preserved and the site holds limited heritage potential. The occurrence is rated as low significate but its position within the sensitive medium significance Iron Age site (Exigo-BIS-C2) should be noted and observed. The farmstead remains occur within the project area and it is recommended that the necessary destruction permits be obtained from the relevant Heritage Resources Authorities prior to site impact and destructions they are older than 60 years and generally protected under heritage legislation.
- A number of small stone terraces (**Exigo-BIS-T1)** occur in the proposed Bismarck dam footprint area. The poorly preserved stone structures probably indicate a Later Iron Age Farmer Period occupation and the site might be significant in terms of its regional and local representation in the Iron Age Farmer Period landscape of the area. It is rated as low significance and the documentation of the features (mapping, desktop study, possible Phase 2 site sampling) is recommended. The necessary destruction permits should be obtained from the relevant Heritage Resources Authorities prior to site impact and destruction.
- Wide-spread Iron Age Farmer settlement remains representative of the Transitional K2 (TK2), K2 and Khami periods (**Exigo-BIS-C1 - Exigo-BIS-C9)** occur in clusters the project area and the universal significance of these clusters within the context of the MCL and the MCLWHS landscape is apparent. The mitigation of each of the clusters prior to destruction is essential where a comprehensive research-driven heritage mitigation plan is required to need to inform a robust research framework. The framework should (1) determine the extent of the Iron Age archaeological horizon on Bismarck and in the project area, (2) investigate the nature, stratigraphy, extent and cultural context of the Iron Age Farmer landscape, (3) provide an interpretation of the Bismarck Iron Age horizon within the context of the MCL landscape and it's OUVs, and (4) aim to preserve the historical fabric of the Bismarck Iron Age horizon in terms of the MCLWHS OUVs and in particular, development areas for the purposes of future

research in the MCL landscape. Mitigation of the clusters should include a detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the MCL whereby a robust research driven mitigation methodology based on current research themes within the MCL is formulated. All clusters should be documented by means of systematic surveys and site mapping and extensive surface and subsurface sampling of selected zones within clusters should be conducted in order to generate material for analysis and preservation. The analysis of all excavated material by means of Ceramic, Fauna, Geoarchaeology, Archaeobotany, Isotope and Bioarchaeology analysis as well as Radiocarbon Dating of samples representative of all Clusters, will be required. It is essential that recovered material is processed and curated according to conventional professional archaeological collections management principles which include the accessioning, packing and inventorying of material. This heritage mitigation plan should culminate in the publication of research findings. This mitigation plan should be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage authorities and the process should include a comprehensive Public Participation and Social Engagement process, preferably conducted by a Social Specialist whereby all relevant stakeholders (SAHRA, SANParks, the World Heritage Council and Advisory bodies, the Mapungubwe National Park, Venetia Mine, Vhembe Biosphere Reserve, Peace Parks Foundation and Musina Local Municipality, the Department of Mineral Resources & Department of Environmental Affairs) are adequately consulted. Generally, the sites and the general landscape should be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains. It should be stressed that any future mitigation must take cognisance of the fact that the Bismarck Iron Age clusters are part of an integrated landscape-wide settlement system, where impact on one part of the system affects the whole.

- Six burial sites occurring within the Bismarck Dam & Pipelines EIA Project (**Exigo-BIS-BP1 - Site Exigo-BIS-B6**) are of high significance and the sites will be impacted on by site development. It is primarily recommended that the burial sites be conserved *in situ* and that conservation buffers of at least 50m be implemented around the heritage receptors. Each of the sites should be fenced and access gates should provide controlled access to the sites. A distance of at least 2m should be maintained between the graves and fences which should be at least 1,8m high. Clear signboards should be erected indicating the heritage sensitivity of the sites and contact details for visitation of the graves should be provided. The sites should be monitored on a weekly basis during initial site clearing and earth moving activities by an ECO familiar with the sensitivity of receptors, or the Heritage Consultant in order to detect any impact at the earliest opportunity. Further monthly monitoring of the burial sites is recommended during subsequent stages of development. A Site Management Plan (SMP) should be implemented detailing these conservation measures and indicating responsible parties in this regard. The developer should carefully liaise with the heritage specialist and the SAHRA Burial Ground and Graves (BGG) Unit with regards to these recommended management measures. Should impact on the resources prove inevitable, the graves should be relocated by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum 1). Generally, it is recommended that the EIA public participation and social consultative process address the possibility of further graves occurring in the project area.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during

construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

- It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the project landscape at archeological sites, along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

Bismarck Dam & Pipelines EIA Project Heritage Occurrences

Site Code	Coordinate S E	Short Description	Mitigation Action
EXIGO-BIS-S1	S22.23837° E29.57587°	**Stone Age (MSA)**	**Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. **Phase 2 Mitigation:** Legally compliant Phase 2 Study and assessment if impacted on. **Permitting:** Apply for relevant alteration / destruction permits for Phase 2 and consequent impact.
EXIGO-BIS-S2	S22.25013° E29.57223°	**Stone Age (MSA)**	
EXIGO-BIS-C1	S22.24106° E29.57891°	**Iron Age Farmer Site Cluster**	**Site Monitoring:** Strict frequent monitoring during construction by the heritage consultant or an ECO familiar with the heritage occurrences of the site. **Phase 2 Mitigation:** Legally compliant Phase 2 Study and assessment if impacted on. **Permitting:** Apply for relevant alteration / destruction permits for Phase 2 and consequent impact.
EXIGO-BIS-C2	S22.23562° E29.57882°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C3	S22.23724° E29.55825°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C4	S22.23137° E29.55520°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C5	S22.21974° E29.54557°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C6	S22.21332° E29.54171°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C7	S22.20830° E29.53494°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C8	S22.20795° E29.53930°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-C9	S22.20325° E29.52798°	**Iron Age Farmer Site Cluster**	
EXIGO-BIS-T1	S22.24374° E29.56028°	**Iron Age Terracing**	
EXIGO-BIS-H1	S22.23562° E29.57882°	**Historical Period Feature**	**Monitoring:** Site monitoring by the heritage consultant or an ECO familiar with the heritage occurrences of the site. **Permitting:** Apply for alteration / destruction permits if sites are impacted on.
EXIGO-BIS-B1	S22.24261° E29.56414°	**Burial Site**	**Avoidance: 50**m conservation buffers, site fencing and access control, site management plan **Site monitoring:** Weekly monitoring during initial site clearing and earth moving activities by an ECO familiar with the sensitivity of receptors, or the Heritage Consultant. Monthly monitoring of the burial sites is recommended during subsequent stages of development.. **Grave Relocation:** Grave relocation subject to authorizations and permitting if impacted on.
EXIGO-BIS-B2	S22.24100° E29.57895°	**Burial Site**	
EXIGO-BIS-B3	S22.24654° E29.57148°	**Burial Site**	
EXIGO-BIS-B4	S22.24698° E29.57099°	**Burial Site**	
EXIGO-BIS-B5	S22.24736° E29.57156°	**Burial Site**	
EXIGO-BIS-B6	S22.21335° E29.54523°	**Burial Site**	

This report details the methodology, limitations and recommendations relevant to these heritage areas, as well as areas of proposed development. It should be noted that recommendations and possible mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

NOTATIONS AND TERMS/TERMINOLOGY

Absolute dating: Absolute dating provides specific dates or range of dates expressed in years.

Archaeological record: The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact: Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the Southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

Assemblage: A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

Context: An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context,* disturbance or displacement by later ecological action or human activities occurred.

Cultural Heritage Resource: The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape: A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM): A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Feature: Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Lithic: Stone tools or waste from stone tool manufacturing found on archaeological sites.

Matrix: The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Midden: Refuse that accumulates in a concentrated heap.
Microlith: A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.
Monolith: A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Phase 1 CRM Assessment: An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study: In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure: A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Provenience: Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association,* the co-occurrence of an artefact with other archaeological remains; and *superposition,* the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling: A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Scoping Assessment: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

Site (Archaeological): A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Stratigraphy: This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Systematic Sampling: A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
BGG	Burial Grounds and Graves
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MCLWHS	Mapungubwe Cultural Landscape World Heritage Site
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
OUV	Outstanding Universal Value
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
SANParks	South African National Parks
SoOUV	Statement of Outstanding Universal Value
YCE	Years before Common Era (Present)
UNESCO	United Nations Education, Scientific and Cultural Organisation
WHS	World Heritage Site

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1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability (Pty) Ltd (Exigo) was commissioned by AGES Limpopo to conduct an Archaeological Impact Assessment (AIA) study subject to an Environmental Impact Assessment (EIA) process for the proposed Bismarck Dam & Pipelines EIAProject in the Limpopo Province. The rationale of this AIA is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

Exigo's expertise ensures that all projects be conducted to the highest international ethical and professional standards. As archaeological specialist for Exigo Sustainability, Mr Neels Kruger acted as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA) as well as a Master's Degree candidate in archaeology at the University of Pretoria.

1.3 Project Brief

AGES Limpopo (Pty) Ltd has been appointed by Eastern Produce Estates SA (Pty) Ltd to undertake the environmental impact assessment process for the proposed new orchards on Bismarck 116MS, Koningsmark 117MS, Skutwater 115MS & Weipe 47MS, Vhembe District Municipality in the Limpopo Province (hereafter referred to as the "Bismarck Dam & Pipelines EIA Project").

The activities entail the following:

- Construction of an in-stream dam in an unnamed tributary of the Kongoloop and Limpopo River for the storage of water for irrigation purposes in two phases.
- Phase 1 will have a main dam wall height of 22.5 meters, surface area of 110 hectares and storage capacity of approximately 8 000 000 cubic metres.
- For Phase 2 the main wall will be raised by 3 metres to increase the surface area to 170 hectares with a storage capacity of 15 000 000 cubic metres.
- Water will be pumped from the Limpopo River during surface flow according to the existing lawful use.

Construction of three 630 mm pipelines to fill the dam. Water from the dam will be used for irrigation of croplands and orchards (existing and possible future developments (ELU).

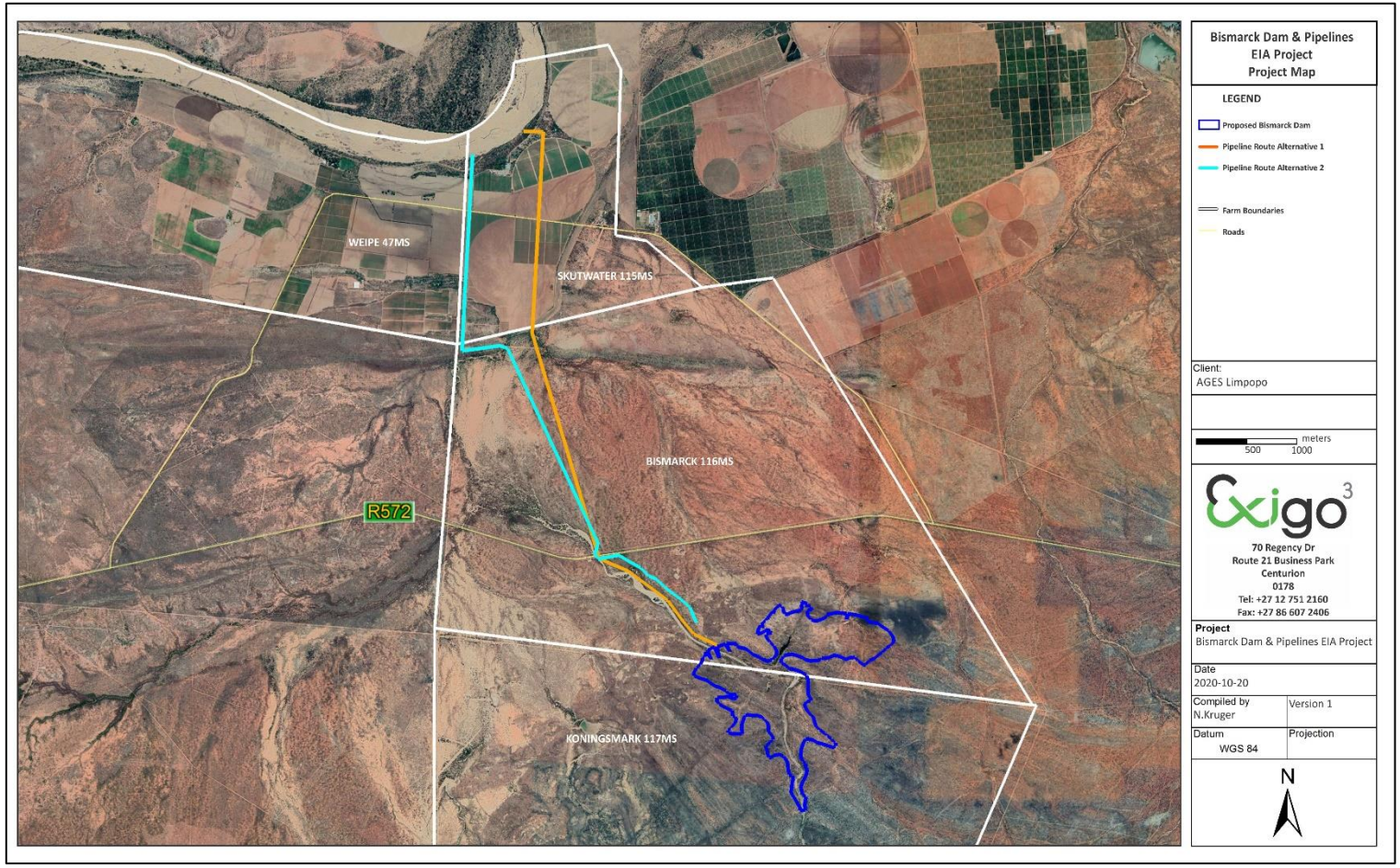


Figure 1-1: Map indicating the farm portions subject to the Bismarck Dam & Pipelines EIA Project.

Figure 1-2: Map indicating the proposed phased development of the Bismarck Dam.

1.4 Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that, through the management of change, developments still conserve our heritage resources. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of heritage resources where development is "socially, culturally, environmentally and economically sustainable and where unnatural disturbance is unavoidable, it must be mitigated to enhance the cultural and natural heritage". The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. The NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources. In addition, all developments within World Heritage Site borders or buffers must be guided by the essential guidelines developed by UNESCO and ICOMOS in assessing risk to World Heritage Sites as well as achieving a balance between the protection of World Heritage Sites and infrastructure development activities. Based hereon, this project functioned according to the following **terms of reference for** heritage specialist input**:**

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may be affected, if any.*
- *Assessment of the potential impact (both positive and negative as well as short and long term) of the proposed project and its associated activities on the SoOUV for MCLWHS. Potential impact at all stages of the project lifespan must be clearly indicated.*
- *Assess the nature and degree of significance of such resources within the area.*
- *Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;*
- *Assess and rate any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible heritage management measures provided that such action is necessitated by the development.*
- *Liaise and consult with the South African Heritage Resources Agency (SAHRA). A Notification of Intent to Develop (NID) will be submitted to SAHRA at the soonest opportunity.*
- *Recommendations for beneficiation projects such as research, publications and community heritage projects, i.e. contribute to the knowledge of Mapungubwe for dissemination to the general public.*

1.5 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

1.5.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and its provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act No 25 of 1999 (section 35) the following features are protected as cultural heritage resources:

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and paleontological sites
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58).”

and

“No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority;

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60).”

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves and burial grounds are commonly divided into the following subsets:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments.

c. National Heritage Resources Act No 25 of 1999, section 35

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation’s cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

1.5.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

1.6 UNESCO Framework

1.6.1 Background

According to ICOMOS Guidelines on Heritage Impact Assessments for Cultural World Heritage Properties, 2011; "World Heritage Sites are thus single heritage assets with an international value that has been clearly articulated. Not everything within them contributes to OUV, but those attributes that do must be appropriately protected". The core of the MCL contains a representative collection of attributes that must be protected (Mapungubwe Nomination Dossier 2002). As such, this study was guided by the essential guidelines developed by UNESCO and ICOMOS in assessing risk to World Heritage Sites as well as achieving a balance between the protection of World Heritage Sites and infrastructure development activities. These guidelines are essential in evaluating the risks and or opportunities associated with development in heritage sensitive areas. When combined with a number of conceptual frameworks such as the continuous evolution of cultural landscapes and robust qualitative methodologies, these guidelines offer a potent platform for risk assessment and management (Pikirayi 2012).

1.6.2 Cultural Landscapes

Cultural landscapes are boundless and cannot be defined by geographical coordinates (UNSECO 1972; Munjeri 2000). This definition is supported by the fact that communities living around World Heritage sites view heritage resources as points on an evolving landscape (Munjeri 2000). Cultural landscapes are places of cultural significance. According to the South African National Heritage Resources Act of 1999 ''cultural significance'' means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. As such, communities value heritage protection and continued but sustainable consumption of both the heritage and the landscape.

1.6.3 Outstanding Universal Values (OUVs)

Heritage (1972) provides a framework for listing natural and cultural heritage of universal value as World Heritage Sites. It also notes that globally, heritage is at risk and that "deterioration or disappearance of any item of the cultural or natural heritage constitutes a harmful impoverishment of the heritage of all nations of the world". Heritage protection at the national level very often remains incomplete because of the scale of the resources which requires and of the insufficient economic, scientific and technological resources of the country where the property is situated. It is for this reason that the Convention regards parts of this heritage to be of outstanding interest and therefore needs to be preserved as part of the world heritage of mankind as a whole. The concept of OUV first discussed by UNESCO in 1976, was interpreted as "meaning that a property submitted

for inclusion in the World Heritage List should represent or symbolize a set of ideas or values which are universally recognized as important, or having influenced the evolution of mankind as a whole or at one time or another". Since then, a number of criteria have been developed to measure OUV (Refer to Jokilehto 2005) and, at its 28th session, the World Heritage Committee agreed to the following definition, as set out in paragraph 49 of the Operational Guidelines (2005):

"Outstanding universal value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole…."

The Committee recognized that the definition and application of OUV will be subject to evolution over time. This evolution is reflected in the changes that have been made to the criteria and their application. The Committee also noted that the concept of OUV is often poorly understood and requires improved communication generally at the site level and recommended that the identification of OUV be achieved with the participation of stakeholders, including local communities and indigenous people. The development of the SoOUV for World Heritage properties as required by the Operational Guidelines for the Implementation of the World Heritage Convention (UNESCO 2008) was meant to set out clearly the attributes that reflect OUV and the links between them. Integrity and authenticity are also useful in understanding OUVs. There are also concepts such as 'limits of acceptable change' and 'absorption capacity' which are being discussed within the framework of OUV. It is not clear at this stage how useful these concepts are, or how they may be operationalized. There is also no agreement on how to revive heritage value that has been eroded (ICOMOS 2008).

1.6.4 Buffer Zones

Buffer zones are managing tools for effective heritage protection. Basically, a buffer zone is a piece of land that lies between the boundaries of heritage resources and other land use activities. It is useful for flagging threats to heritage sites. Once development is allowed in the buffer, it means that such threats may extend to the listed or protected area. Although a useful concept, it is not clear what the optimum size of a buffer zone is. This is made more complicated by the ever-increasing demand for land to meet day to day survival needs. The awareness that heritage should co-exist with other equally important needs has often prompted governments to use their discretion to allow some developments to take place in sections of the buffer zone under stringent regulatory conditions. It is important to have a fixed buffer zone which implies the need to fix boundaries of cultural properties (Pikirayi 2012).

A detailed guideline of statutory terms and requirements is supplied in Addendum 1.

2 REGIONAL CONTEXT

2.1 Area Location

The proposed Bismarck Dam & Pipelines EIA Project occurs on portions of the farms Bismarck 116MS, Koningsmark

117MS, Skutwater 115MS & Weipe 47MS in the Limpopo Valley in the Vhembe District Municipality, Limpopo Province. The project area is bordered to the north by the Limpopo River which is also the international border with Zimbabwe. The town of Musina occurs approximately 50km south-east of the project area and Alldays lies 75km to the southwest. The project occurs in the greater Mapungubwe Cultural Landscape (MCL) and within the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) buffer zone with the Mapungubwe archaeological site situated no more than 30km west of the farm. The R572 regional road routes 8km south of the project site. More specifically, key locations along the proposed development footprints are situated at:

- **Bismarck Dam Relative Midpoint** S22.16390° E29.60866°
- **Pipeline Southern Offset** S22.16146° E29.60837°
- **Pipeline Southern Offset** S22.17101° E29.61797°

The site is located on 1:50 000 map sheet **2229BA, 2229BC**.

2.2 Area Description: Receiving Environment

The Bismarck Dam & Pipelines EIA lies within the Savanna biome which is the largest biome in Southern Africa. It is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The environmental factors delimiting the biome are complex and include altitude, rainfall, geology and soil types, with rainfall being the major delimiting factor. Fire and grazing also keep the grassy layer dominant. According to Acocks (1975) the site falls within the Mopane veld vegetation type, while the most recent classification by Mucina & Rutherford (2006) is the Musina Mopane Bushveld and Limpopo Ridge Bushveld vegetation types. The project area is located within the Limpopo Plain Eco-region and is situated to the north of the Soutpansberg and to the south of the Limpopo River. The study area is defined as extremely irregular plains to slightly undulating plains. The topography of the area is a mixture of terrains, ranging from flat to moderately undulating plains, outcrops, bottomlands (drainage channels) and moderately undulating hills. An ecological assessment and wetland delineation will be conducted and included in the EIA Report.

2.3 Site Description

The landscape in the project area is generally flat, with undulating hills and sporadic mountains occurring in the area. Existing infrastructure on the project properties comprises site offices, farmsteads, citrus packing facilities, access roads and irrigation dams. For the largest part, the Bismarck Dam & Pipelines EIA sites are situated in pristine landscapes that has seen little transformation. A northern section of the pipeline routes through citrus orchards and these areas have been transformed entirely. For the rest of the project landscape, undisturbed grassland and mountain vegetation, vast Mopane Veld and riparian undergrowth are prevalent. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is agricultural land.

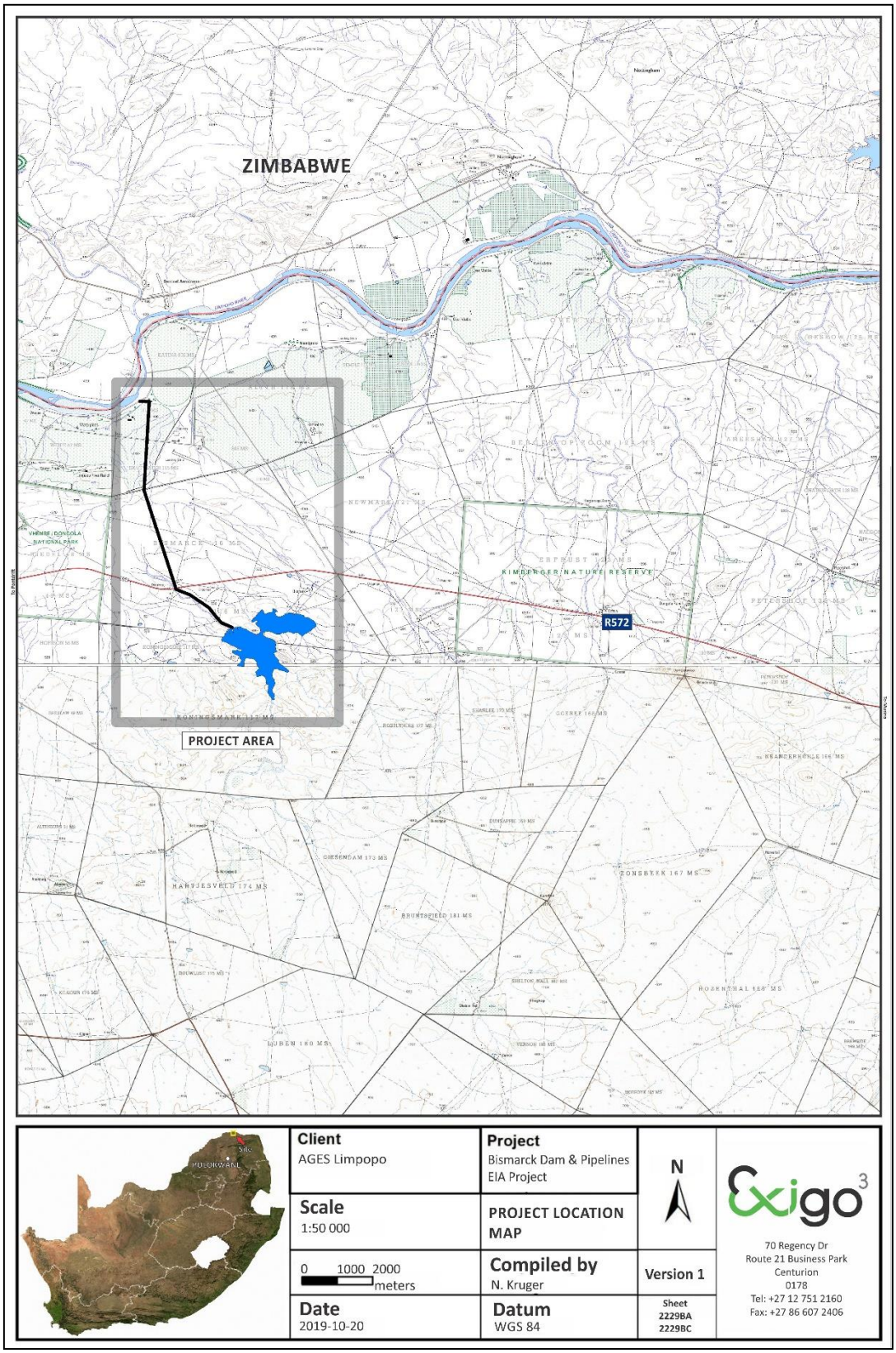


Figure 2-1: 1:50 00 Map representation of the location of the proposed Bismarck Dam & Pipelines EIA Project (sheet 2229BA, 2229BC).

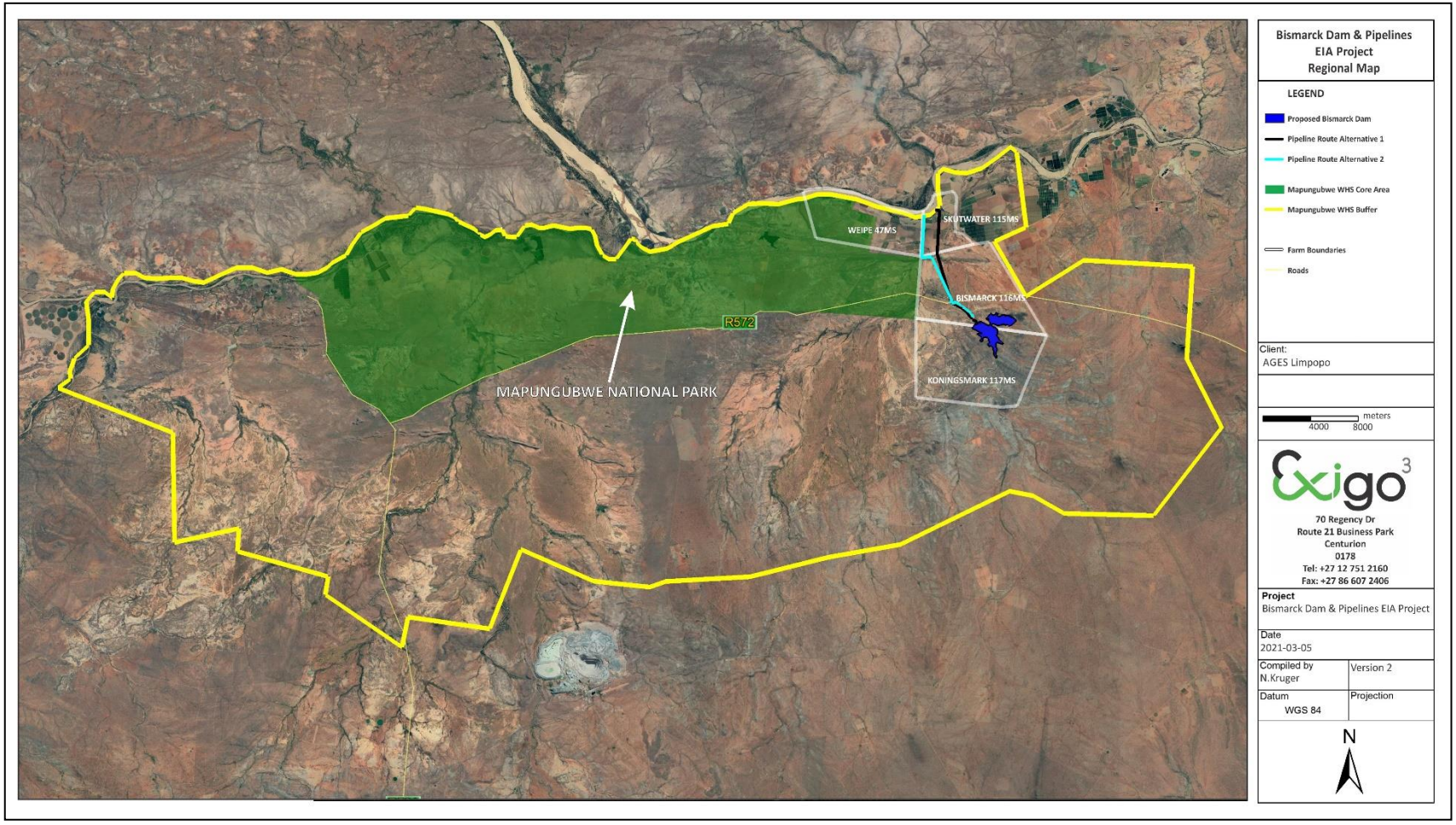


Figure 2-2: Aerial map providing a regional context for the proposed Bismarck Dam & Pipelines EIA Project area.

3 METHOD OF ENQUIRY

3.1 Sources of Information

Data from detailed desktop, aerial and field studies were employed in order to sample surface areas systematically and to ensure a high probability of heritage site recording.

3.1.1 Desktop Study

The larger MCL has been well documented in terms of its archaeology and history. A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. Numerous academic papers and research articles supplied a historical context for the proposed project and archival sources, aerial photographs, historical maps and local histories were used to create a baseline of the landscape's heritage. In addition, the study drew on available unpublished Heritage Assessment reports to give a comprehensive representation of known sites in the study area.

3.1.2 Aerial Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. Site assessment of the project properties relied heavily on this method to assist the challenging foot and automotive site survey. Here, depressions, variation in vegetation, soil marks and landmarks were examined and specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. In addition, historical aerial photos obtained during the archival search were scrutinized and features that were regarded as important in terms of heritage value were identified and if they were located within the boundaries of the project area they were physically visited in an effort to determine whether they still exist and in order to assess their current condition and significance. By superimposing high frequency aerial photographs with images generated with Google Earth as well as historical aerial imagery, potential sensitive areas were subsequently identified, geo-referenced and transferred to a handheld GPS device. These areas served as reference points from where further vehicular and pedestrian surveys were carried out.

3.1.3 Mapping of sites

Similar to the aerial survey, the site assessment of the project properties relied heavily on archive and more recent map renderings of the properties to assist the challenging foot and automotive site survey where historical and current maps of the project area were examined. By merging data obtained from the desktop study and the aerial survey, sites and areas of possible heritage potential were plotted on these maps of the larger Limpopo Valley area using GIS software. These maps were then superimposed on high definition aerial representations in order to graphically demonstrate the geographical locations and distribution of potentially sensitive landscapes.

3.1.4 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the Bismarck Dam & Pipelines EIA Project area was conducted over three field work periods in July, August and September 2020. The process encompassed a random field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. As the

project area is densely vegetated, particular focus was placed on GPS reference points identified during the aerial and mapping survey. Where possible, random spot checks were made and potentially sensitive heritage areas were investigated. Using a Garmin GPS, the survey was tracked and general surroundings were photographed with a Samsung Digital camera. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible disturbed areas during the survey.

3.2 Limitations

3.2.1 Access

The project properties are accessed via the R572 and the "Weipe" local road connecting to the R572 road to Musina and also from the border patrol road along the Limpopo River. Access control is applied to the farms relevant to this assessment but no restrictions were encountered during the site visits as the author of this report was accompanied by the owners / managers of the establishments. A number of farm service roads provided vehicular access to all areas relevant to this assessment and no access constraints were encountered.

3.2.2 Visibility

The surrounding vegetation around Limpopo Valley is mostly comprised out of mixed grasslands, riparian undergrowth and dense tree cover in places. The surroundings in the project area remain relatively pristine and visibility at the time of the AIA site inspection (July, August and September 2020) was moderate to low (see Figures 3-2 to 3-11). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.

Figure 3-1: View of general surroundings in the project area looking south.

Figure 3-2: View of the project area looking north towards the Limpopo River.

Figure 3-3: The project area on the farm Bismarck.

Figure 3-4: View of Mopani Veld in the project area.

Figure 3-5: View of Mopani Veld in the project area on Bismarck.

Figure 3-6: View of the project area on Koningsmark.

Figure 3-7: View of the purposed location of the Bismarck dam wall.

Figure 3-8: View of the project area at the proposed Bismarck dam location.

Figure 3-9: View of general surroundings in the project area.

Figure 3-10: View of general surroundings in the project area on Bismarck.

Figure 3-11: View of the project area on Skutwater

Figure 3-12: View of a dilapidated hunting lodge on Bismarck.

3.2.3 Summary: Limitations and Constraints

The site survey for the Bismarck Dam & Pipelines EIA Project AIA proved to be highly constrained and the investigation primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the mapping and aerial survey) as well as areas of potential high human settlement catchment. In summary, the following constraints were encountered during the site survey:

- The surrounding vegetation in the project areas are mostly comprised out of dense pockets of indigenous species, occasional trees and mixed grasslands. The general visibility at the time of the site inspection was moderate to and visibility proved to be a major constraint in the project area.
- Dense vegetation restricted free movement on the site this proved to be a constraint during the site assessment of the project area.

Cognisant of the constraints noted above, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the

archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

3.3 Impact Assessment

For consistency among specialists, impact assessment ratings by Exigo Specialist are generally done using the Plomp[1] impact assessment matrix scale supplied by Exigo. According to this matrix scale, each heritage receptor in the study area is given an impact assessment. The significances of the impacts were determined through a synthesis of the criteria below:

4 ARCHAEO-HISTORICAL CONTEXT

Archaeology in Southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across Southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens sapiens* including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD **(commonly restricted to the interior and north-east coastal areas of Southern Africa)**	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD **(commonly restricted to the interior and north-east coastal areas of Southern Africa)**	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD **(commonly restricted to the**	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.

[1] Plomp, H.,2004

interior and north-east coastal areas of Southern Africa)			
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

4.1 Discussion: The Limpopo Cultural Landscape

The landscape north of the Soutpansberg has always played an important ecological and cultural role in the history of South Africa. The natural environment of the area has established itself as an ideal occupational terrain; large rivers in the area such as the Soutsloot, Mutamba, Limpopo, Sand and Nzhelele have provided water, the fertile soil surrounding the rivers have provided food and the strategically situated foothills north of the Soutpansberg sheltered many groups of people and many generations. This section of the Limpopo valley, presenting the most important time periods in the history of South Africa, have been utilised and cultivated from the beginning of mankind, the signs of which are still visible today in the hundreds of archaeological sites scattered across the landscape. These signs range from 300 000 year old handaxes from the Earlier Stone Age, microlithic tools from the Later Stone Age, pot sherds, grinding stones and walling of previous Venda inhabitants to rock paintings and engravings

The Limpopo Valley was first formally documented by early travellers, explorer and missionaries that moved through areas surrounding the Limpopo River. Possibly the most valuable historical sources of information on the 19th century Limpopo Valley are maps of the Soutpansberg and surrounding, such as those compiled by Bertoud in 1903, Raddatz in 1870, Merensky in 1880 (see Figures 5-1 to 5-3) and Troye in 1892.

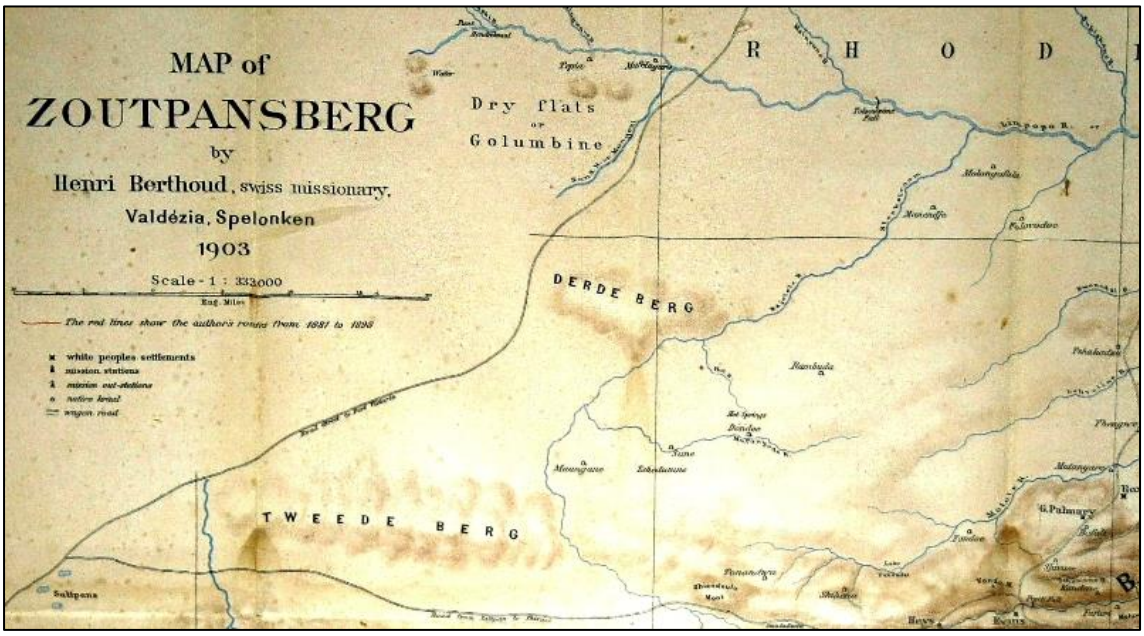


Figure 4-1: "Map of the Zoutpansberg", compiled by the Swiss Missionary Henri Bertou c.1903.

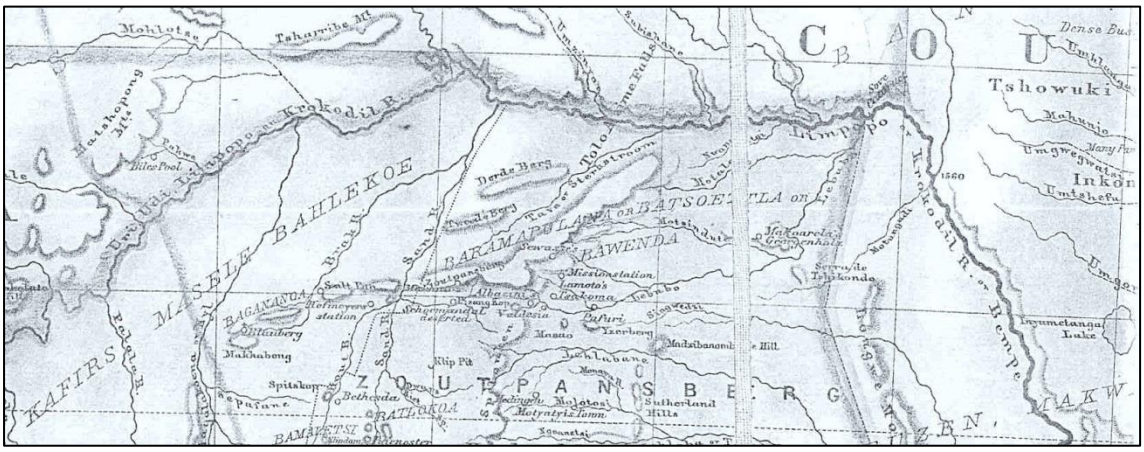


Figure 4-2: "Map of the Transvaal", compiled by Alexander Merensky c.1880.

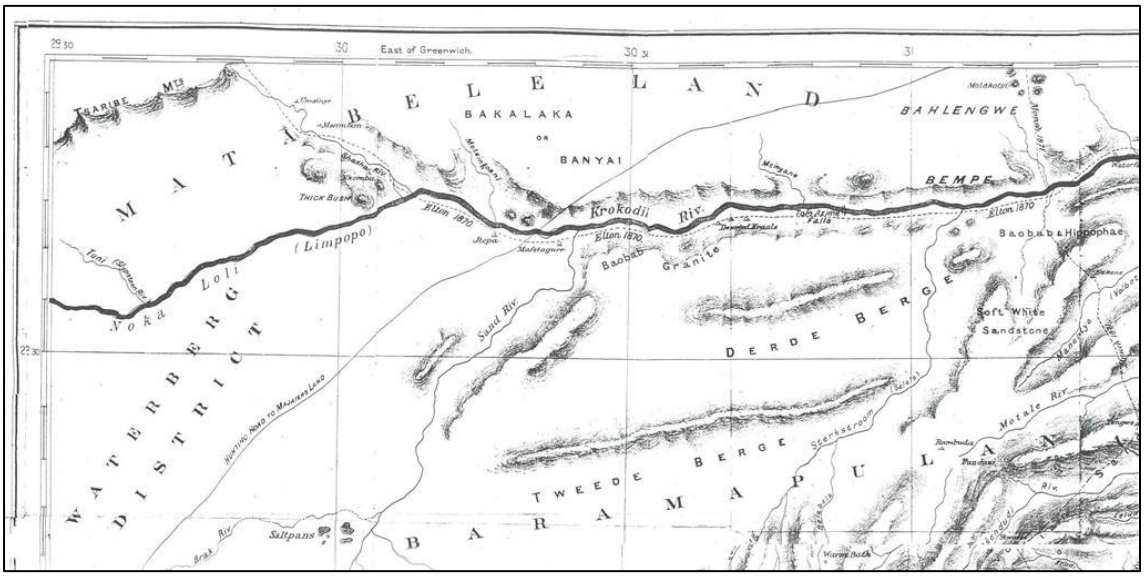


Figure 4-3: "Map of the Transvaal Goldfields, Zoutpansberg District", compiled by H. Raddatz c1870.

Later research in the area includes important work by Government Ethnologist N.J van Warmelo in the first part of the 20th century. It is also during this period that the first academic research commenced at Mapungubwe and other Iron Age sites in the Limpopo valley. Central to these studies were Guy Gardner, Neville Jones and Leo Fouché who not only conducted systematic archaeological excavations at Mapungubwe, but also recorded Iron Age sites along the Limpopo River Basin.

In recent years, the Limpopo Valley has been the subject of frequent archaeological and historical studies. Dr Cathy Kuman (University of the Witwatersrand) is currently conducting seminal research on the Earlier Stone Age of the Limpopo Valley. However, the Middle Stone Age has not been studied in detail and research by Francis Thakeray (Transvaal Museum) proves to be unique in terms of the Limpopo Valley MSA. In contrast to the MSA, Later Stone Age occurrences dating to the last two millennia, particularly Rock Art and stone implements have been extensively investigated. In past years, Ed Eastwood, Sven Ouzman and Ben Smith, amongst others addressed the rock art of the Limpopo Basin and Bronwyn van Doornum and Lynn Wadley looked at LSA assemblages. John Calabrese, Simon Hall, Ben Smith, Karim Sadr, Alex Schoeman and Tom Huffman informed on the interaction between Hunter-gatherers and farming communities during the first and early second millennia AD in their research. Central to the Iron Age cultural landscape of the Limpopo Valley is the Mapungubwe Iron Age Horizon, an area which has been intensively studied by researchers such as Guy Gardner, Leo Fouche, Andrie Meyer, John Calabrese, Tom Huffman, Alex Schoeman, Edwin Hanisch

and MacEdward Murumbika. have contributed significantly to our understanding of the Mapungubwe Cultural landscape.

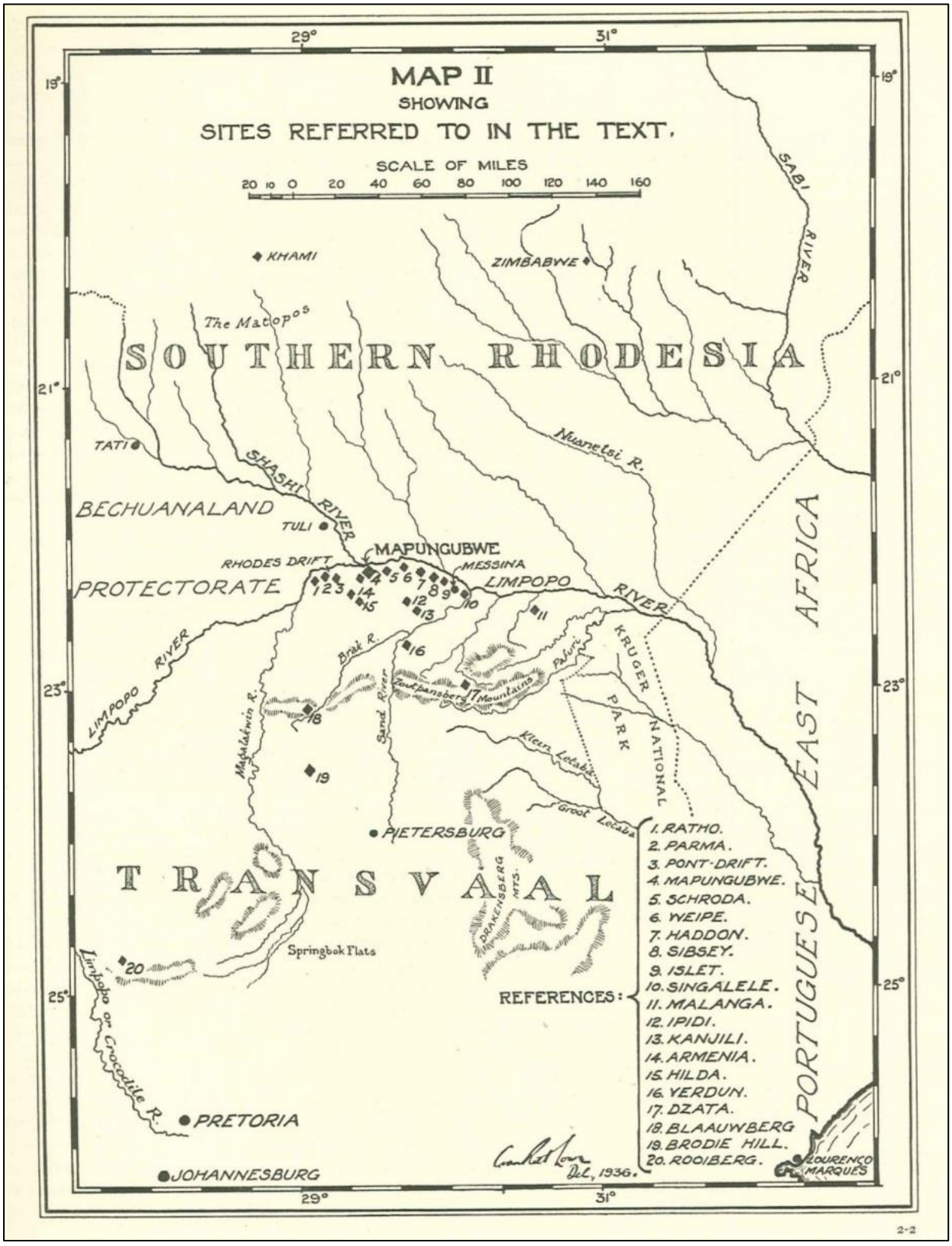


Figure 4-4: Map of archaeological sites around Mapungubwe, compiled by Neville Jones in 1935.

- **Archaeological Impact Assessment Reports**

A number of Archaeological Impact Assessments by qualified archaeological specialists and consultancies have been conducted in the Limpop Valley. These include:

- A survey of the farms Uitenpas and Musina for the conversion of prospecting rights to mining rights on these properties (Archaic Heritage Consultants: 2009).
- A survey of the Nancefield area for the extension of residential units 2007 (Kruger & Antonites: 2007).
- A survey of the site where the Musina Shopping Centre was constructed (Archaeo-Info:2000)
- A survey of large surface areas south of Musina for the construction of electricity distribution power lines (Nzumbululo Heritage Solutions: 2008)
- A survey of the farms Jooste 511 MS and Dorothy 254 MS for the construction of the Sand River Valley Development (Nzumbululo Heritage Solutions:2006)
- A survey of large surface areas south of Musina for the construction of a new power line from Paradise-T to Musina Substations (Pistorius, J.C.C: 2008)
- A survey of Portion 5 of the farm Uitenpas 2 MT for a new township establishment on (Vhufa Hashu Heritage Consultants: 2007)
- A survey of the farm Overvlagte 125 MS for the construction of an irrigation dam (Vhufa Hashu Heritage Consultants: 2007)
- A survey of the farm Modena 13 MS Development of a Medium Density Security Wildlife Estate (R & R Cultural Resource Consultants)
- A survey for the proposed Alldays solar facility photovoltaic (pv)/ concentrated photovoltaic (cpv) solar energy facility (Nzumbululo Heritage Solutions)
- A survey for the Proposed Construction of Electricity Distribution Powerlines Within, Limpopo Province (Nzumbululo Heritage Solutions)
- A survey of the farm Bivack for the Proposed Two Rivers Limpopo Tourism (Archaeo-Info)
- A survey in Mhinga Xikundu Village for the Construction of Power-Line (Nzumbululo Heritage Solutions)
- An archaeological assessment of Tourist Developments in the Mapungubwe Cultural Landscape (Archaeological Resources Management)

4.1.1 Palaeontology

In the Alldays area as well as the larger Limpopo Landscape, certain geological strata i.e. the fossiliferous Madzwaringe and Mikambeni Formations of the Tuli Basin are known to be fossiliferous. The available literature shows that the Karoo strata of the Limpopo Province are exceptionally rich in fossils. Several palaeontological sites have been reported from the Tuli Basin in South Africa and Zimbabwe and from the Tshipise Basin. These fossils fall mainly into two groups: firstly, the plant leaf imprints, stem fossils and coal from the lower part of the Karoo-age sedimentary succession (Middle Permian) and secondly, the dinosaur and thecodont fossils from the upper part (Late Triassic to Early Jurassic) of the Karoo-age sedimentary succession. Fossil leaf imprints were found in the Tuli Basin sedimentary rocks on the Venetia mine grounds to the east of the study area in the Tshipise Basin, and to the north of the study area in southern Zimbabwe. The fossils from the Tuli Basin are mainly leaf imprints of the extinct plant Glossopteris. However, stem imprints of the horsetail Equisetales and leaf imprints of ferns are also common. The fossil localities reported in the Tuli Basin are contemporaneous to those in the Tshipise Basin described by Van den Berg (1980) and studied by the author in the Njalaland section of the Kruger National Park, Tshikondeni Mine, Venetia Mine and the farm Nottingham in southern Zimbabwe. The species composition of the fossils and the lithologies of the palaeontological sites are similar in the Tuli and Tshipise Basins. The most recent taxonomic work on the Middle Permian fossil plants of the Tuli Basin was done by Kovacs-EndrOdy in 1983 who identified 37

Glossopteris species from the rviikambeni Formation (Brandi. 2002)

4.1.2 Early History and the Stone Ages

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and *Homo habilis* have been found in dolomite caves and underground dwellings in the Bankeveld at places such as Sterkfontein and Swartkrans near Krugersdorp. Homo habilis, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles. The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with *Homo erectus*, who manufactured hand axes and cleavers from as early as one and a half million years ago. Oldowan and Acheulian artefacts were also found four to five decades ago in some of the older gravels (ancient river beds and terraces) of the Vaal River and the Klip River in Vereeniging. The earliest ancestors of modern man may therefore have roamed the Vaal valley at the same time that their contemporaries occupied some of the dolomite caves near Krugersdorp. Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and point s that may have had long wooden sticks as hafts and were used as spears. The Late Stone Age commenced twenty thousand years ago or somewhat earlier. The various types of Later Stone Age industries scattered across the country are associated with the historical San and Khoi-Khoi people. The San were renowned as formidable hunter-gatherers, while the Khoi-Khoi herded cattle and small stock during the last two thousand years. Late Stone Age people manufactured tools that were small but highly effective, such as arrow heads and knives.

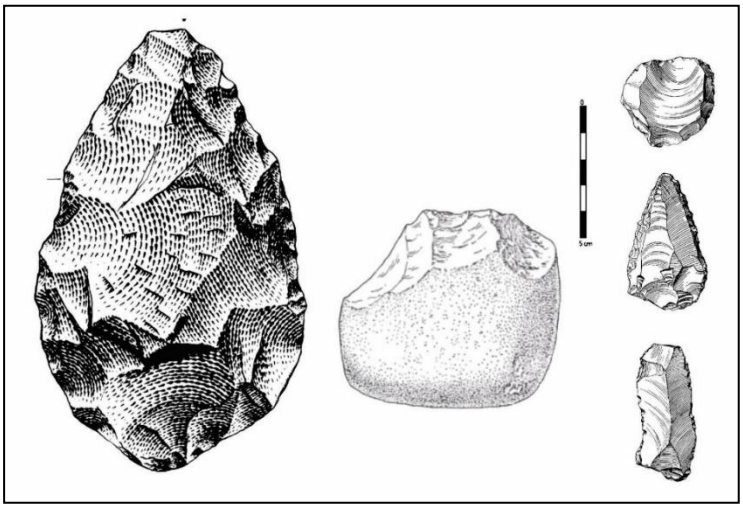


Figure 4-5: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

The Earlier Stone Age of the Limpopo Valley has been extensively researched. Results from these research projects show that earlier Stone Age areas, dating back to 2.5 million years ago occur in areas around Musina and sites have been identified in riverbank deposits at many of the larger rivers and tributaries in the area. Specifically, areas around Mapungubwe, Tshipise and the Sand River are known to hold rich early Stone Age deposits where formal stone tools such as specialized hand axes typical of the Acheulian industry of the early Stone Age were found. Similar to the distribution of ESA material, middle Stone Age sites occur widely in the Limpopo Valley near streams or other sources of water in the vicinity of source material used for the

manufacture of stone tools. Artefacts such as stone points, blades and scrapers which date to more or less 125 000 years before present occur in large scatters around Musina and the Limpopo Valley. In the last two millennia the valley was occupied by the San hunter gatherers and Khoe herders/hunter gatherers and the later Stone Age is abundantly represented in the Limpopo River horizon in the form of rock shelters containing microlithic stone tools such as bladelets, scrapers, points and cores as well as rock markings and art. In addition a rich Hunter-Gathered legacy, LSA groups such as the San displayed intricate relationships with herders and farming communities in the area in the past centuries LSA sites occur across the Limpopo Valley in hills and around farmer-period settlements).

4.1.3 Rock art and markings

Rock paintings are mainly known from the mountainous areas of Botswana, Namibia, Zimbabwe and South Africa, while rock engravings are mainly confined to the Kalahari-fringe areas of Namibia, Botswana, Zimbabwe and the central and northern interior of South Africa. In the Limpopo Valley and Soutpansberg areas alone over 800 sites with paintings and engravings are known, and more are still being re-discovered. Most engravings were made by pecking, a technique that made use of a hammer stone and stone punch, or by direct percussion. Three painting traditions are present in the Limpopo Valley and Vhembe District; Hunter-Gatherer, Khoenkhoen and Bantu-speaker art.

- **Hunter-Gatherer rock paintings**

The delicate and frequently detailed San fine-line paintings were made using brushes made from twigs, quills, sticks or feathers. Red and yellow pigments applied in this way were made from various shades of ferric oxides or ochres; black pigments were prepared from charcoal and minerals like specularite, and white pigments from silicas and various riverine clays. The paintings of Vhembe-Dongola area are dominated by images of men and women. The most painted animal is the kudu, followed by giraffe, tsessebe, impala and elephant. There are also images of San loincloths and aprons. In contrast, in Eastern Vhembe, human images are rare, and the main animals depicted are the giraffe and the zebra.

The Kaoxa Shelter, situated west of Mapungubwe on the farm Machete is regarded as one of the most significant Rock Art sites in the Limpopo Valley. Paintings of at least 16 animal species are found in this shelter. This diversity suggests that many species of animals were important in the belief system of the Limpopo-Shashi San hunter-gatherers. There are 13 images of locusts painted - an unusual and unique subject for the San artists. These are the only known rock paintings of locusts in southern Africa. At least 5 San painting 'styles' occur here. In addition there are geometric finger paintings. There are 4 complex panels in this site, an unusual feature in the LSCA. Explanatory lecterns have been set up below each set of paintings.

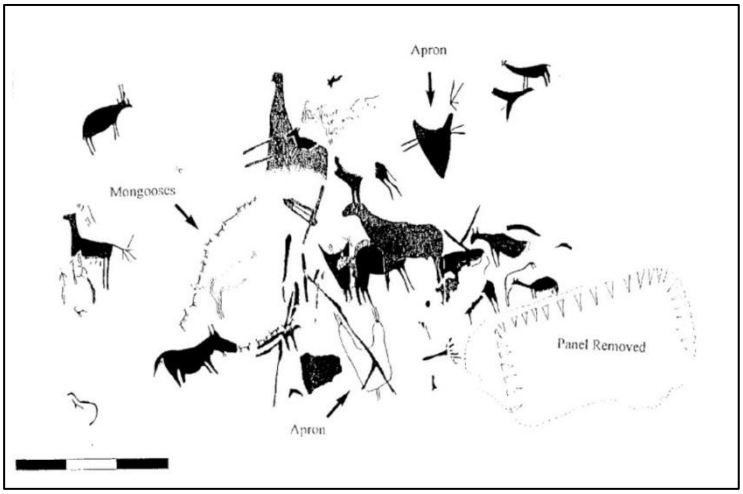


Figure 4-6: Tracing of a complex painted panel at Koaxa Shelter.

- **Khoekhoe rock paintings**

Khoekhoe rock art mainly comprises red and white finger paintings of dots, strokes, geometric forms, handprints and a component of representational motifs. This painting tradition extends from Central Africa to the southern parts of South Africa. In the Limpopo River Valley and its environs, Khoekhoe art comprises handprints, finger dots and strokes, variations of the circle motif, and images of fringed and unfringed women's aprons. The accompanying chart illustrates the image classes found in the Limpopo region. The paintings are large and bold, and were painted in red or white, applied by human fingers, unlike the more familiar San paintings which are fine and delicate, painted with sticks and bristles in a variety of colours, and depict things we can recognise: animals and people. Like the San paintings, however, Geometric Tradition pigments were carefully applied, albeit by finger, as evidenced by the crisp clear outlines and with no sign of splashing — images clearly made without haste and without a mess. Again, like the San paintings, Khoekhoe paintings are made with colourants like red ochres and white minerals that were finely ground and mixed with binders, judging from the way the paints penetrate and adhere to the rock and are not easily washed off by water seepage. Although the art is sometimes found in the same rock shelters as engravings, San paintings, or Northern Sotho paintings, or various combinations of these techniques and traditions the Khoekhoe paintings are often found in small low-ceilinged shelters high up on the sides of hills or between tumbled rocks on the summits of hills — one has to bend down or even crawl in order to view the art where it is frequently placed on the ceiling. They are also frequently found in huge shelters with sharply sloping floors. All these locations are in stark contrast to San preferences for painting sites. The San generally used comfortable rock shelters at ground level, with horizontal, usually sandy floors — and preferred to paint on vertical rock faces.

- **The rock paintings of Bantu-speakers**

Another tradition of painting known as "Late Whites" is found in the Soutpansberg and the Limpopo Valley. These finger-paintings consist of anthropomorphic, zoomorphic and geometric designs. These paintings were often daubed in several colours, but generally speaking the imagery is predominantly white. Recent research in south-central Africa suggests that the Late White tradition is at least partially explicable. Because the art is fairly recent; and the people who live near the sites are only a few generations removed from the painters, it has been possible to relate the symbolism depicted in the art to modern forms of ritual and the use of symbolism. In the Limpopo Province, at least some of the Late White tradition paintings can be linked to Sotho-speakers. It is likely that the imagery was linked to rites of passage.

- **Rock engravings: Utilitarian hollows, Mafuvha and Cupules**

Utilitarian hollows are small pecked depressions usually about the size of a bottle cap and roughly 20 millimetres deep. These hollows are typically found on horizontal surfaces: pavements in the open, or on stone floors and on loose rocks within shelters. They may have been used as anvils for cracking open the seeds of the Marula or Sour Plum, for example, which both contain edible nuts, or as receptacles for holding ostrich-eggshell 'blanks' or 'roughouts' whilst the central hole was being drilled. Although the San may have made some of the hollows that were used as work surfaces, others were possibly also made and/or used by Khoekhoen and Bantu-speakers. Another type of hollow is that of the mafuvha board game. Used mainly as a form of recreation, the game also has a ritual function and is linked to rain and fertility throughout Africa. Although mainly associated with Khoekhoen and Bantu-speakers, this game, generally known as mankala, is also played by San people so it is quite possible that at least some of the game boards on stone pavements in the Limpopo River Valley were also made by San hunter-gatherers. A final category of small hollows, called 'cupules', comprises groups of apparently randomly distributed depressions situated on sloping or vertical rock faces or on large boulders within rock shelters. In some shelters up to 1000 cupules are found on rounded free-standing boulders, and to a lesser extent, on vertical rock faces. Some of these rows or random arrangements of cupules are situated up to 3,5 metres above ground level, suggesting that the engravers built some sort of scaffold to laboriously peck some of these marks into the relatively hard and durable

sandstone rock faces. Their situation on the rock also suggests that they were made for a specific ritual rather than a mundane purpose. Their position and planar orientation on big boulders similarly suggest a ritual and symbolic function. Some of the cupules, in contrast to the utilitarian hollows, have a silica skin over them, the result of a process of salt deposition that must have occurred over a very long period of time. The apparent age of these cupules alone suggests that were probably made by hunter-gatherers.

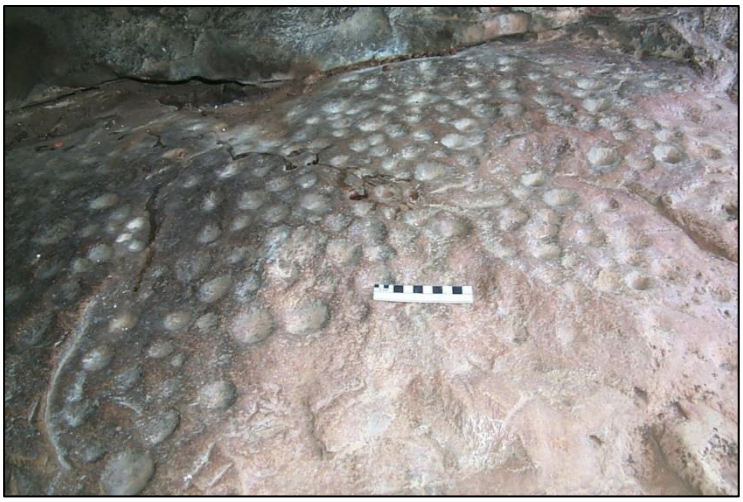


Figure 4-7: Cupules, engraved into a rock face at Ha-Tshirundu, east of Musina.

- **Rock engravings: Grooves**

Grooves are elongated, usually parallel, marks incised or abraded into the rock face. They generally range from the length of a matchstick to the length of an outstretched hand. Some have rounded profiles, while others are V-shaped. Grooves, like cupules discussed in the previous section, are divided into the utilitarian: those found on open, horizontal pavements or on loose rocks within shelters and the symbolic, those occurring on vertical or sloping rock faces in shelters. The utilitarian grooves may have been used for sharpening iron, bone or wooden points. They are situated in places in which it would have been comfortable to sit at ease while executing such a task. These grooves might have been made by anyone, however, not necessarily the San. Symbolic grooves are situated on rock faces up to four metres above ground level. Their great height suggests that they also served some symbolic function. Like the symbolic cupules, some of the grooves are covered in a silica skin, a phenomenon that suggests some antiquity. More often than not, cupules and grooves are associated — their co-occurrence hints at a related, symbolic function.

- **Rock engravings: Engraved animals**

San peoples or their ancestors undoubtedly made the engravings of animals, because similar engravings all over southern Africa have been shown to have San authorship. Like San paintings, these engravings have been shown to have their roots in a shamanistic cosmology. In most areas of the subcontinent engravings were associated with ideas about rainmaking or depict elements of the medicine dance and the supernaturally potent animals

4.1.4 Iron Age / Farmer Period

The beginnings of the Iron Age (Farmer Period) in Southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Iron Age people moved into Southern Africa by c. AD 200, entering the area either by moving down the coastal

plains, or by using a more central route. From the coast they followed the various rivers inland. Being cultivators, they preferred rich alluvial soils. The Iron Age can be divided into three phases. The Early Iron Age includes the majority of the first millennium A.D. and is characterised by traditions such as Happy Rest and Silver Leaves. The Middle Iron Age spans the 10th to the 13th Centuries A.D. and includes such well known cultures as those at K2 and Mapungubwe. The Late Iron Age is taken to stretch from the 14th Century up to the colonial period and includes traditions such as Icon and Letaba.

The Iron Age of the Limpopo Province is dominated by the Mapungubwe Cultural Landscape around the Shashe-Limpopo confluence. At the core of this horizon lay the Middle Iron Age sites of Mapungubwe and K2. However, early Iron Age farmers moved into the Limpopo valley centuries before the advent of the Mapungubwe Kingdom. These early Iron Age farmers, which formed part of the Kalundu Ceramic Tradition (the western stream of migration into South Africa); regionally know as Happy Rest, settled on the southern foot of the Soutpansberg between in the 5th century AD. Later, at around AD 900 the Zhizo capital at Schroda near the Limpopo Shashe confluence came into existence. Through this group, the Limpopo Valley interior was first integrated directly with the Indian Ocean trade network. According to the archaeological record, Schroda lost control of the interior portion of the trade network at about AD 1000 to a new group of people known as Leopard's Kopje. They established their capital at K2 on the present day farm Greefswald, while commoner K2 sites were established throughout the Basin. Large amounts of trade goods from K2 show that trade had enhanced the leader of K2's status which added to the intensification of social ranking. In turn, this contributed to the development of a bureaucratic class which materialized during the onset of the Mapungubwe period. At AD 1220 the K2 leader shifted the capital to the flat hill called Mapungubwe about 2 km from K2. Here the king moved to the hilltop while the majority of his people lived below. It is now known that the Zimbabwe culture evolved in the Shashe-Limpopo basin and that Mapungubwe was the first Zimbabwe capital.

Consequently, archaeologists divide the culture into three chronological periods named after the important capitals:

- Mapungubwe (AD 1220-1290)
- Great Zimbabwe (AD 1290-1450)
- Khami (AD 1450-1820)

At the end of the 13th century the climate throughout Southern Africa appears to have been affected by the spread of the Little Ice Age and it became colder and drier in the interior. In some areas it was no longer possible to cultivate traditional grain crops. As a consequence, Mapungubwe was abandoned; the entire basin depopulated which resulted in the disintegration of the Mapungubwe State. Great Zimbabwe became Mapungubwe's economic, cultural and political successor. Shortly after the demise of Mapungubwe, the first Sotho/Tswana people moved into this part of the interior from East Africa. Khami, a later expression of the Great Zimbabwe culture occurred after AD 1450. Khami sites, during the Middle Iron Age followed the elite Zimbabwe pattern which incorporated stone walling within the settlement organisation. A large portion of early stone walled sites in the Limpopo Valley area dates to this period. Other identifiable features are ceramic scatters on the surface and visible kraals. Venda-speaking communities belong to the most prevalent cultural entity in the Limpopo Valley and the Soutpansberg areas today. According to oral tradition, Venda history occurred in three layers of occupation. The first was Ngona, followed by Lembuthu, Mbedzi, Thavhastindi and others, and lastly Singo. The Lembethi, Mbedzi and Thanhatsindi groups comprises various chiefdoms from Zimbabwe, each ruling Zimbabwe type settlements with typical stone walled palaces (Huffman 2008). We know that Shona-speaking chiefdoms (identified by the Khami facies) moved south of the Limpopo between AD 1400 and 1450, incorporating earlier Sotho-Tswana people. After approximately

100 years of cohabitation, these two independent groups created the Venda language, which is known to be associated with Letaba pottery (Huffman 2005). At present, the ruling Singo, are the descendents of the final occupation. Oral tradition indicate that the Singo moved south across the Limpopo river around AD 1690. They conquered the independent chiefdoms and united the Venda nation for the first time. Dzata, in the Nzhelele Valley, was the capital of Singo but was later abandoned during the reign of the legendary Thoho-ya-Ndou. As a result the Venda nation fragmented, and the present day three competing dynasties were established (Stayt 1968; Loubser 1991; Huffman 2008).

Figure 4-8: Venda-type stone walled site at Ha-Tshirundu, east of Musina.

4.1.5 Trade, Exploration and Recent History

The historic timeframe sometimes intermingles with the later parts of the Stone and Iron Age, and can loosely be regarded as times when written and oral recounts of incidents became available. The first Europeans to trek through the interior of South Africa north of the Vaal River were the expedition party of Dr. Andrew Cowan who travelled from the Cape to the border of Botswana and from there eastwards to Delagoa Bay. The party however disappeared and was never heard of after a final report written by Cowan in 1808. The Voortrekkers crossed the Vaal River in 1836, and within a few years, began to spread north. Much of the Limpopo Province contained tsetse fly, and so early Boer farmers didn't settle immediately in the area. Rather the area was used primarily for hunting. The first contact between Venda-speaking groups and white pioneers occurred during 1836 when the trek of Louis Trichardt entered the Soutpansberg. In 1850 the town of Schoemansdal was founded, which led to increased contact between the two groups. At this time European traders also entered the area, which led to the circulation of western goods in the Limpopo Valley. After the establishment of the Zuid-Afrikaansche Republiek (ZAR) in 1857, White farmers settled throughout the Soutpansberg area. Missionary activity also increased during this period, which affected and changed many indigenous customs

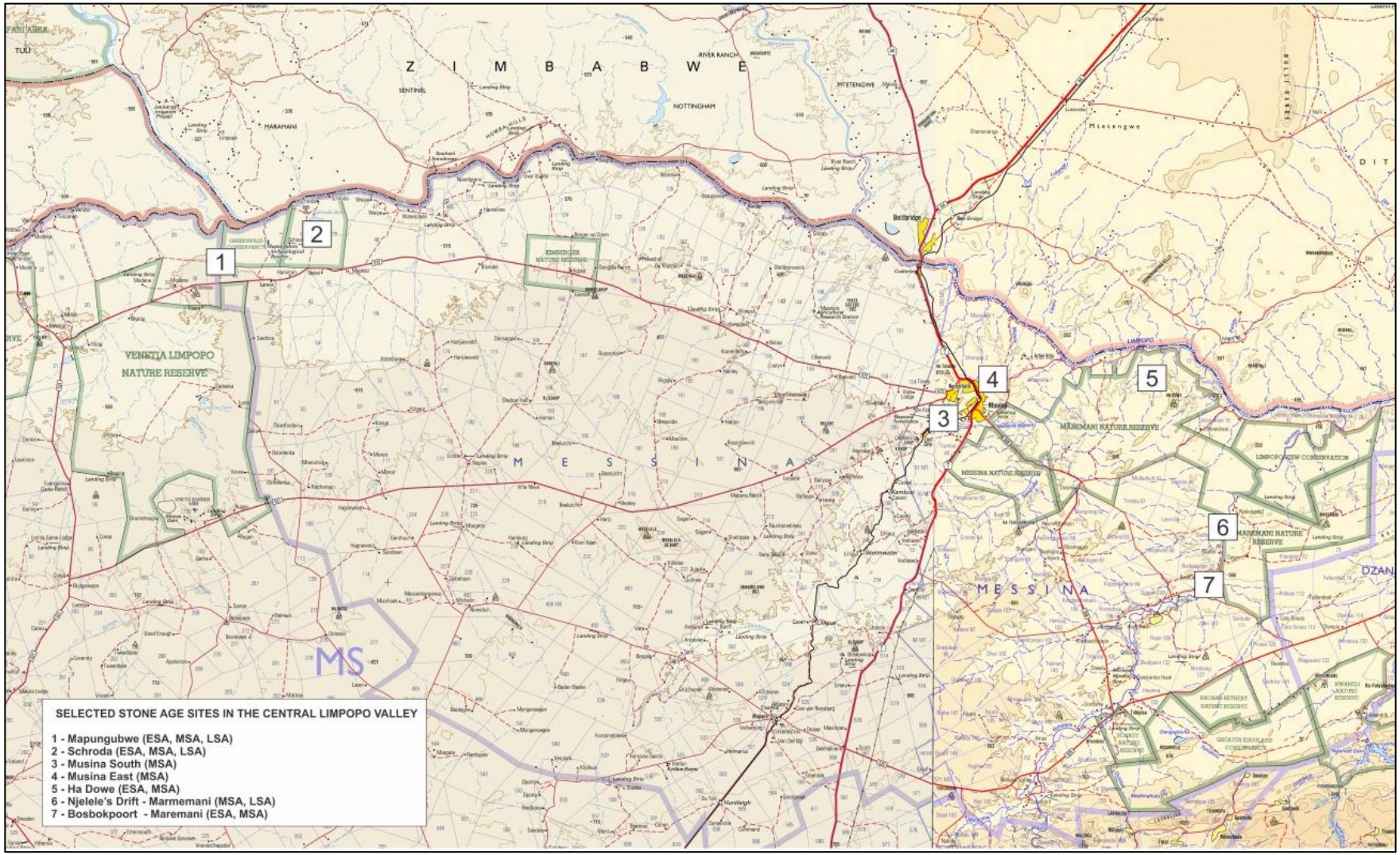


Figure 4-9: Map detailing the occurrence of selected Stone Age and Rock Art sites in the Limpopo Basin.

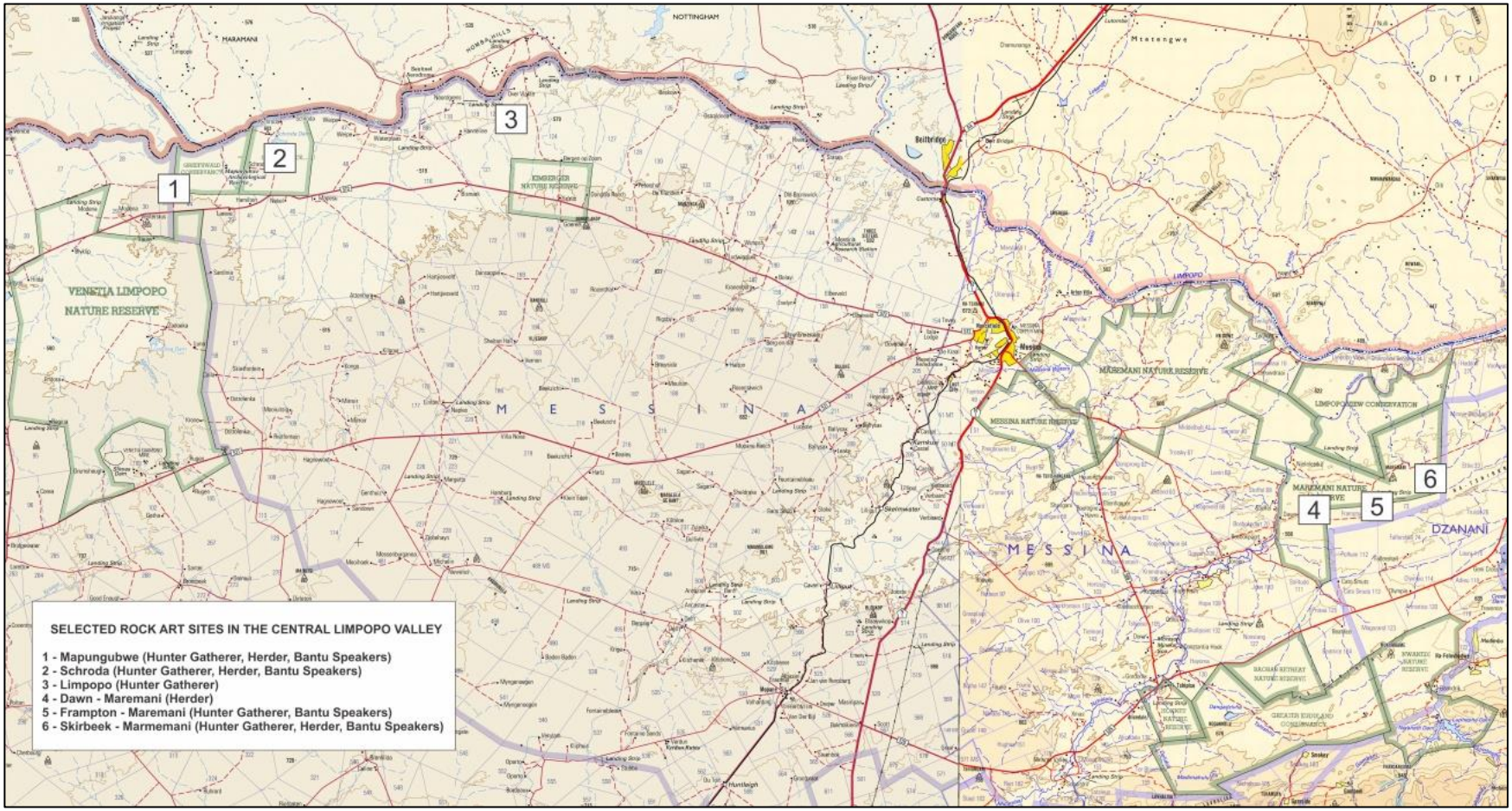


Figure 4-10: Map detailing the occurrence of selected Stone Age and Rock Art sites in the Limpopo Basin

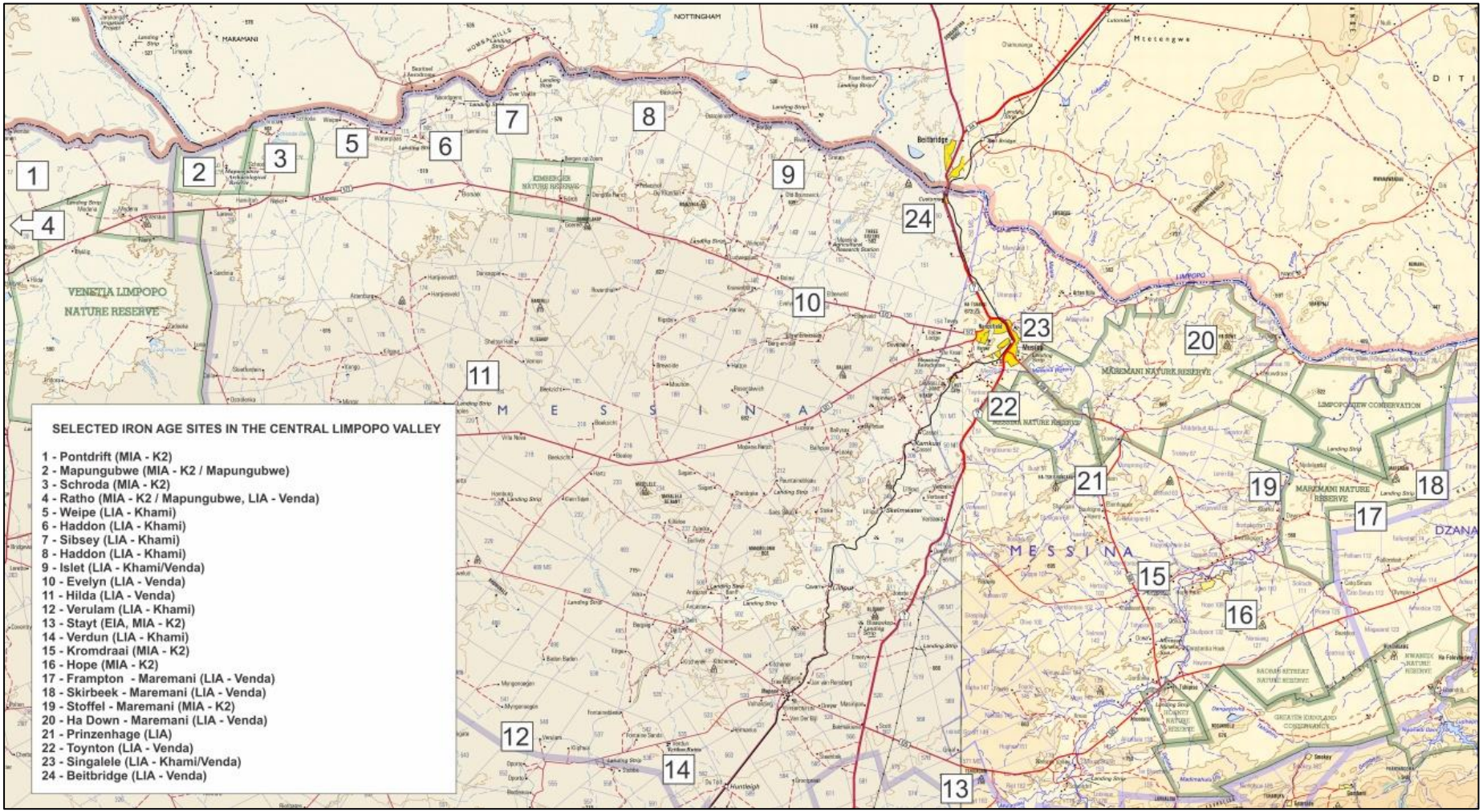


Figure 4-11: Map detailing the occurrence of selected Iron Age horizons in the Limpopo Basin.

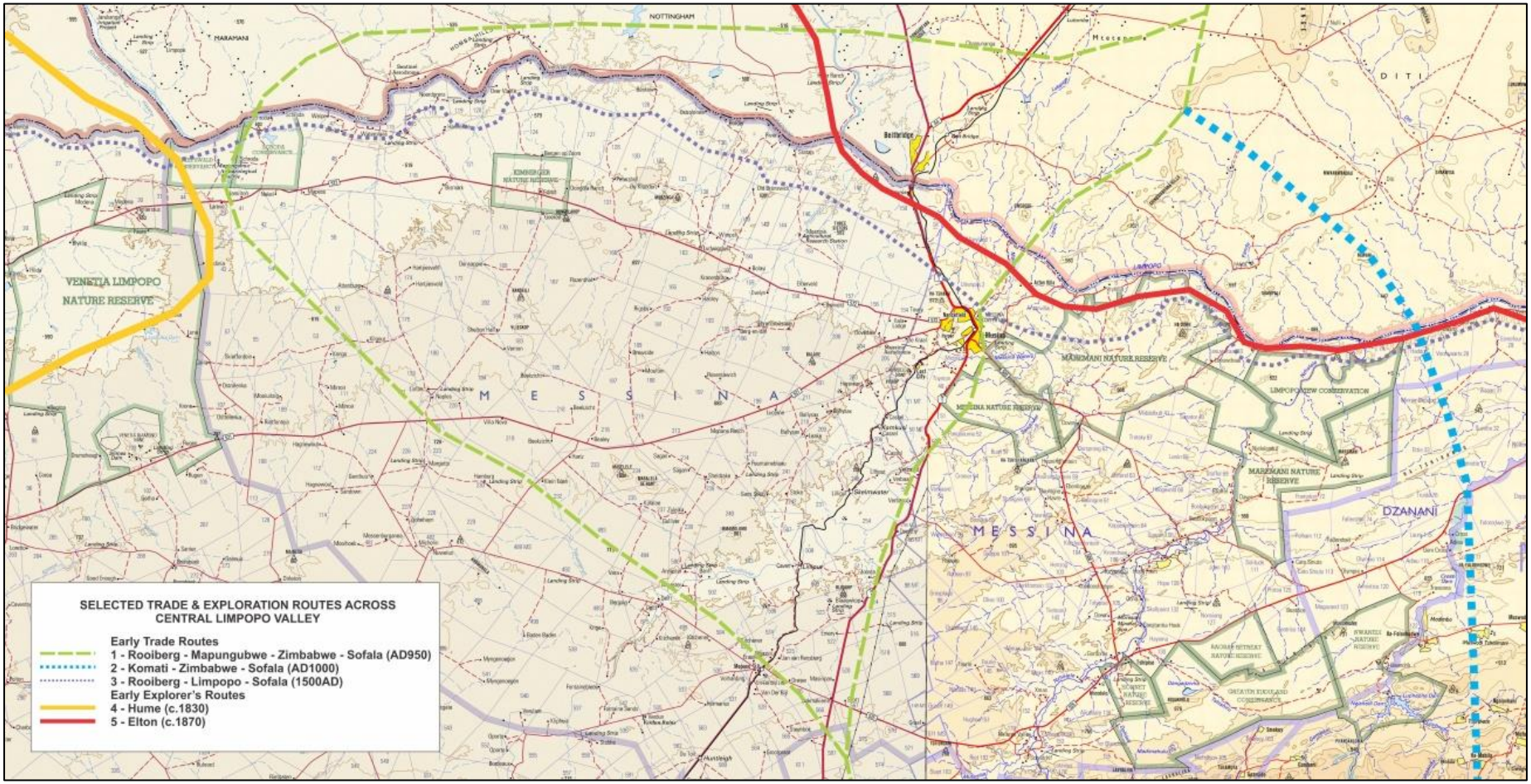


Figure 4-12: Map detailing the movement of traders and explorers in the Limpopo Basin.

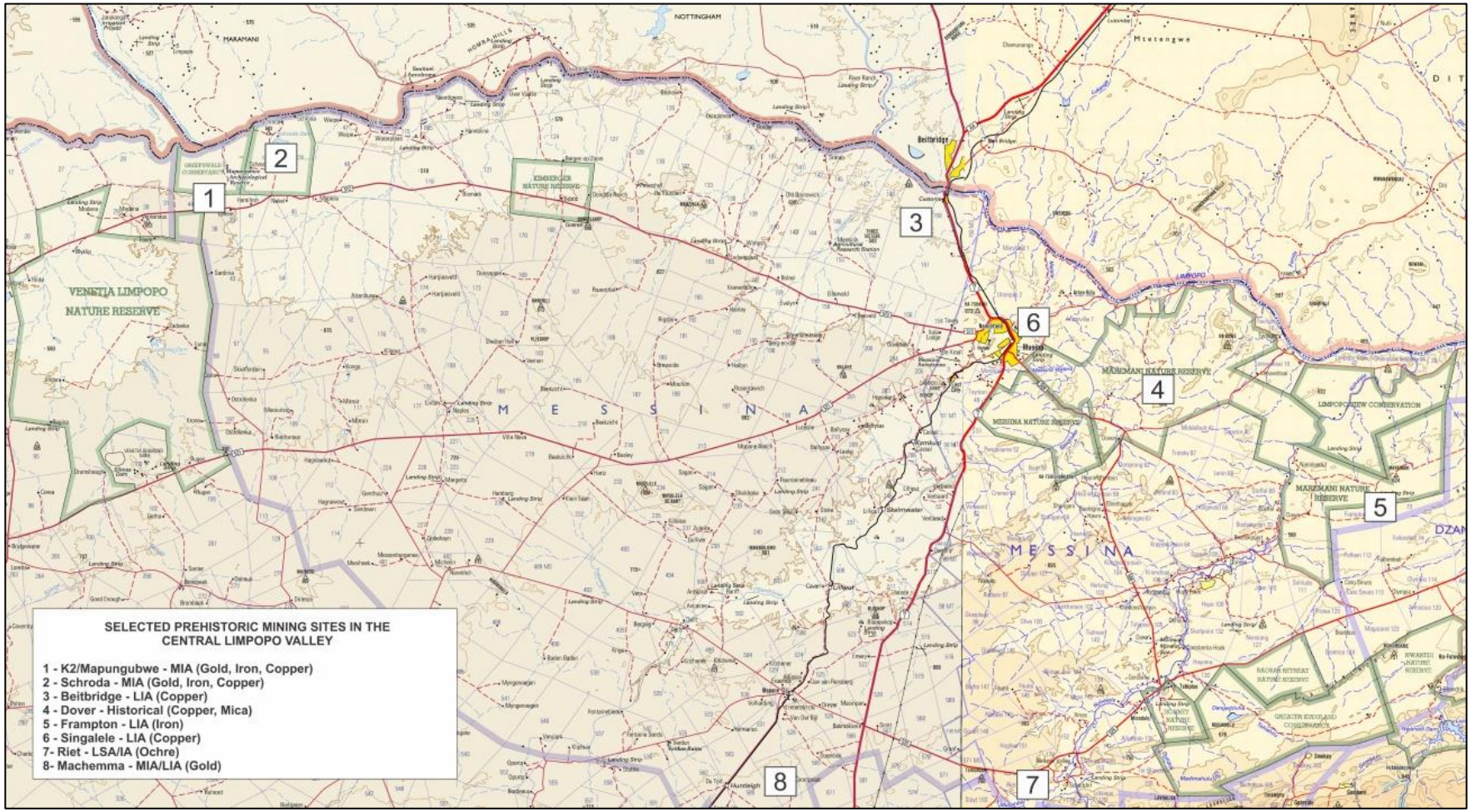


Figure 4-13: Map detailing the movement of traders and explorers in the Limpopo Basin

4.2 Discussion: The Mapungubwe Cultural Landscape

4.2.1 Background

The Mapungubwe Cultural Landscape (MCL) demonstrates the rise and fall of the first indigenous kingdom in Southern Africa between 900 and 1,300 AD. The core area covers nearly 30,000 ha and is supported by a suggested buffer zone of around 100,000 ha. Within the collectively known Zhizo sites are the remains of three capitals - Schroda; Leopard's Kopje; and the final one located around Mapungubwe hill - and their satellite settlements and lands around the confluence of the Limpopo and the Shashe rivers whose fertility supported a large population within the kingdom. Mapungubwe's position at the crossing of the north/south and east/west routes in southern Africa also enabled it to control trade, through the East African ports to India and China, and throughout southern Africa. From its hinterland it harvested gold and ivory - commodities in scarce supply elsewhere – and this brought it great wealth as displayed through imports such as Chinese porcelain and Persian glass beads. This international trade also created a society that was closely linked to ideological adjustments, and changes in architecture and settlement planning. Until its demise at the end of the 13th century AD, Mapungubwe was the most important inland settlement in the African subcontinent and the cultural landscape contains a wealth of information in archaeological sites that records its development. The evidence reveals how trade increased and developed in a pattern influenced by an elite class with a sacred leadership where the king was secluded from the commoners located in the surrounding settlements. Mapungubwe's demise was brought about by climatic change. During its final two millennia, periods of warmer and wetter conditions suitable for agriculture in the Limpopo/Shashe valley were interspersed with cooler and drier pulses. When rainfall decreased after 1300 AD, the land could no longer sustain a high population using traditional farming methods, and the inhabitants were obliged to disperse. Mapungubwe's position as a power base shifted north to Great Zimbabwe and, later, Khami.

4.2.2 Discovery

Mapungubwe was the largest settlement in the subcontinent in the 13th century AD before it was abandoned. Various communities settled in the vicinity over the next 500 years. Legends and rumours about the place were passed on from generation to generation. Karel Moerschell, a local German farmer, knew about the gold by 1911, but it was not until the 1930s that the significance of Mapungubwe became more widely known. On 31 December 1932, a local informant, Mowena, led F.S.J. van Graan, and four others to Greefswald farm on Mapungubwe Hill where they saw stone walls and recovered gold and iron artefacts, pottery and glass beads. The finds, which received wide publicity in the media, were reported to the head of the Department of History at the University of Pretoria, Professor Leo Fouche. As a result of his intervention, the University negotiated with the owner of the property, E.E. Collins. In a legal agreement the University took ownership of the gold and other artefacts and secured an option and contract for excavation rights. The University also successfully requested a postponement of prospecting, mining and related activities on Greefswald. In June 1933, Greefswald was bought by the Government and excavation rights were granted to the University of Pretoria.

4.2.3 Research

After the discovery of Mapungubwe in 1932, the University of Pretoria established an Archaeological Committee, which from 1933 to 1947 oversaw research and excavations. Rev. Neville Jones from Zimbabwe and J.F. Schofield were appointed to undertake the first fieldwork in 1934 and 1935 and they were advised by Professor C van Riet Lowe, Director of the Bureau of Archaeology. Their work focused on Mapungubwe Hill, the southern terrace and the midden there. They briefly surveyed other similar sites in the vicinity. From 1935-1940 six excavation seasons at K2 and Mapungubwe Hill were directed by Guy A. Gardner. The results

of his work were published nearly 25 years later. Meyer (1998) describes the excavations on Greefswald between 1933 and 1940 as 'rapid, large scale excavations resulting in the recovery of valuable artefacts'. Research was hampered by 'the lack of professional archaeologists in South Africa, the lack of full-time supervision of the excavations by efficient, trained staff, the fact that adequate scientific methods for Iron Age research had not yet been developed and that the Iron Age in South Africa was virtually unknown to archaeologists. Consequently, many of the deposits on the sites were removed without the meticulous excavation and recording required. These problems inevitably resulted in a loss of irreplaceable deposits and eventually also of excavated materials [and] a lack of scientific data. The next phase of archaeological investigation, in 1953- 1954 and in 1968-1970, under the direction initially of the Department of Anthropology, and then of Professor J F Eloff who was appointed as Head of the newly-formed Department of Archaeology at the University of Pretoria in 1970, was more systematic and focused mainly on the southern terrace. Over the next 25 years from 1970 to 1995, the Department of Archaeology at the University of Pretoria recognised that their first priority was to establish a firm database by testing, correcting and supplementing the earlier research, and concentrating on reconstructing the way of life of the site inhabitants. Between 1979 and 2002 reports have been published on the human and faunal remains, Chinese porcelain, gold objects, class beads and radiocarbon dating. In addition, sites on neighbouring farms have been investigated by students of the University of Pretoria during the 1970s and 1980s. Greefswald has remained the property of the State since the 1930s. Management of the farm was taken over by the provincial Department of Nature Conservation in 1992, and control was transferred to SANParks in 1999.

Since the 1990s, Wits archaeologists have worked in the Mapungubwe landscape investigating Stone Age, Rock Art and Iron Age sites. They concentrated on the last 2000 years. The systematic survey of the National Park and buffer zone, including Little Muck, Schroda and Venetia, has now recorded some 1000 Iron Age sites. Using this data, various graduate students have investigated ethnic stratification (Calabrese PhD 2005), glass beads and international trade (Wood MA 2005), the ethno-archaeology (Murimbika PhD 2006) and archaeology (Schoeman PhD 2006) of rainmaking, the relationship of settlements to the landscape (du Piesanie MSc 2008), faunal remains (Fatherley MSc 2009), agricultural production (Chandler Honours 2009) and spherulites in cattle dung. Current research includes settlements during the Khami Period (du Piesanie PhD) and herding strategies.

4.2.4 Human Remains

At least twenty-four skeletons were unearthed on Mapungubwe Hill but only eleven were available for analysis, with the rest disintegrating upon touch or as soon as they were exposed to light and air. Most of the skeletal remains were buried with few or no accessories with most adults buried with glass beads. Two adult burials (labeled numbers 10 and 14 by the early excavators) as well as one unlabelled skeleton (referred to as the original gold burial) were associated with gold artefacts and were unearthed from the so-called grave area upon Mapungubwe hill. Recent genetic studies found these first two skeletons to be of Khoi/San decent and thought to be a king and queen of Mapungubwe. Despite this latest information the remains were all buried in the traditional Bantu burial position (sitting with legs drawn to the chest, arms folded round the front of the knees) and they were facing west. The Skeleton numbered 10, a male, was buried with his hand grasping the golden Scepter.

The skeleton labeled number 14 (female) was buried with at least 100 gold wire bangles around her ankles and there were at least one thousand gold beads in her grave. The last gold burial (male), who was most probably the King, was buried with a headrest and three objects made of gold foil tacked on to a wooden core-a bowl, scepter and rhino. At least two more rhino were in the sample, but their association with a specific grave is unknown.

In 2007, the South African Government ordered the return of all human remains excavated from Mapungubwe Hill, to be returned to the site. The remains were claimed by various groups, namely the Vhangona (the aboriginal Vhavenda), the Vhatwanamba, Vhaleya, the San as well as Vhalemba who all claimed to be the rightful descendants of the Mapungubwe people and hence claimed the right to bury their "ancestors" with dignity. The human remains were interred on the hill in on 20 November 2007 in specially constructed stone cairns, placed in old excavation trenches.

4.2.5 UNESCO World Heritage Status

"Cultural landscapes" are culturally significant, boundless areas that cannot be defined by geographical coordinates (UNSECO 1972; Munjeri 2000). This definition is supported by the fact that communities living around World Heritage sites (e.g. Great Zimbabwe) view heritage resources as points on an evolving landscape (Munjeri 2000). According to the South African National Heritage Resources Act of 1999 ''cultural significance'' means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. As such, communities value heritage protection and continued but sustainable consumption of both the heritage and the landscape.

The Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) contains about 400 archaeological sites in the core area, some of which provide evidence for the evolution of the state of Mapungubwe between AD 900 and 1300. The MCL was declared a World Heritage Site in 2003 on the basis of the follwing OUV's:

- Criterion (ii): The Mapungubwe Cultural Landscape contains evidence for an important interchange of human values that led to far-reaching cultural and social changes in Southern Africa between AD 900 and 1300.
- Criterion (iii): The remains in the Mapungubwe Cultural Landscape are a remarkably complete testimony to the growth and subsequent decline of the Mapungubwe State which at its height was the largest kingdom in the African subcontinent.
- Criterion (iv): The establishment of Mapungubwe as a powerful state trading through the East African ports with Arabia and India was a significant stage in the history of the African sub-continent.
- Criterion (v): The remains in the Mapungubwe cultural landscape graphically illustrate the impact of climate change and record the growth and then decline of the Kingdom of Mapungubwe as a clear record of a culture that became vulnerable to irreversible change.

4.2.6 The Mapungubwe Cultural Landscape World Heritage Site Buffer Zone

Over the years, the concept of "buffer zones" has emerged as effective managing tools for effective heritage protection. Principally, a buffer zone is a section of land that lies between the boundaries of heritage resources and other land use activities, i.e. an identified area within which activities (e.g. land use change) have an influence on the resource. Buffer zones are useful for flagging threats to heritage sites - once development is allowed in the buffer, it means that such threats may extend to the listed or protected area. According to the Mapungubwe Cultural Landscape World Heritage Site nomination dossier, a buffer zone was proposed at the time of inscription. The UNESCO WHC Advisory Body Evaluation of 2002 notes the following with regards to such a buffer zone:

"The core site covers nearly 30,000 ha. This is supported by a buffer zone of around 100,000 ha – although this is not marked on the maps supplied. The nominated site contains substantial areas of 'natural' landscape of very high quality – in the north of the area bordering the rivers. To the south the boundary cuts across geometrical citrus farms – which in time will be taken out of agriculture. The proposed boundaries correspond with those of the Vhembe- Dongola National Park, which is currently in the course of being established. No

clear buffer zone is indicated on the maps supplied. The northern boundary of the nominated property is the Limpopo River, which forms the frontier between the Republic of South Africa and the neighbouring states of Botswana and Zimbabwe. A Trilateral Memorandum of Understanding has been drawn up with the objective of establishing the Limpopo-Shashe Transfrontier Conservation Area (TFCA); this very extensive area (5,040 km2), will, when established as a TFCA, constitute a very effective buffer zone. It is intended that each country will concentrate on one facet of protection: cultural heritage in South Africa, wildlife in Botswana, and living cultures in Zimbabwe."

The dossier, which stated that Mapungubwe was declared on the basis of Iron Age sites dating between AD900 and 1300, also acknowledged the presence of sites dating to different periods. When Mapungubwe was inscribed as a World Heritage cultural landscape, the boundaries of the National Park were seen as providing a natural buffer to the main heritage sites of Schroda, Bambandyanalo and Mapungubwe Hill. A buffer zone was subsequently delineated and gazetted along with the core zone in the Government Gazette in January 2009 by the Department of Environmental Affairs. The rationale for including certain areas in the buffer zone has been based on the proposed Limpopo-Shashe TFCA expansion plan where it was assumed that the proposed TFCA would constitute an effective buffer for the world heritage property. Cognisant of the large scope of the then Limpopo-Shashe TFCA (now Greater Mapungubwe TFCA) a decision was taken to adopt a phased approach in the development of this TFCA. Phase one of the South African component of the TFCA as outlined in the draft Integrated Development Plan for Greater Mapungubwe TFCA is comprised of Mapungubwe National Park and World Heritage Site, and Venetia Nature Reserve. However, realizing that the gazetted buffer is of such a significant size and encompasses a multitude of landowners and land tenure, the need to re-assess the extent and alignment of this zone was identified. In addition, the UNESCO World Heritage Committee Decision of September 2010 still refers to the buffer zone as "proposed" and highlights the need for clarity on the exact delineation of the buffer zone. It is therefore clear that the concept of a buffer zone for the Mapungubwe Cultural Landscape World Heritage Site has been conceptualized differently and continues to be an unresolved issue. This buffer challenge is being addressed SANParks' 2013 – 2018 Management Plan for the Mapungubwe National Park in terms of Sections 39 and 41 of the National Environmental Management: Protected Areas Act (Act 57 of 2003) and chapter 4 of the World Heritage Convention Act (Act 49 of 1999), which states that:

"A significant challenge over the next planning horizon is the establishment of a functional buffer zone that can protect the World heritage site from external developments, particularly mining." (Mapungubwe National Park and World Heritage Site Management Plan 2013 – 2018 p.9)

From the above it is clear that, for SANParks development within a Mapungubwe Cultural Landscape World Heritage Site buffer is an uneasy fit which might potentially negatively impact on its mandate to conserve the unique cultural-historical and biodiversity characteristics of the area, and especially the status of the park as a World heritage site and a Transfrontier conservation area (TFCA). In addressing this then, SANParks is proposing the expansion of the footprint of the Mapungubwe National Park and World Heritage Site to cover an area of about 33,000 ha area centred on the confluence of the Limpopo and Shashe Rivers, and bounded by the Pontdrift - Musina regional road in the west and south, and extensive agriculture lands in the Weipe area in the east (Pikirayi 2012).

With the re-examination of the buffer zone SANPARKS aims to finally formalise the Mapungubwe Cultural Landscape World Heritage Site protection buffer in order to more effectively facilitate the strategic engagement with numerous prospecting and mining applications and other development initiatives in the area.

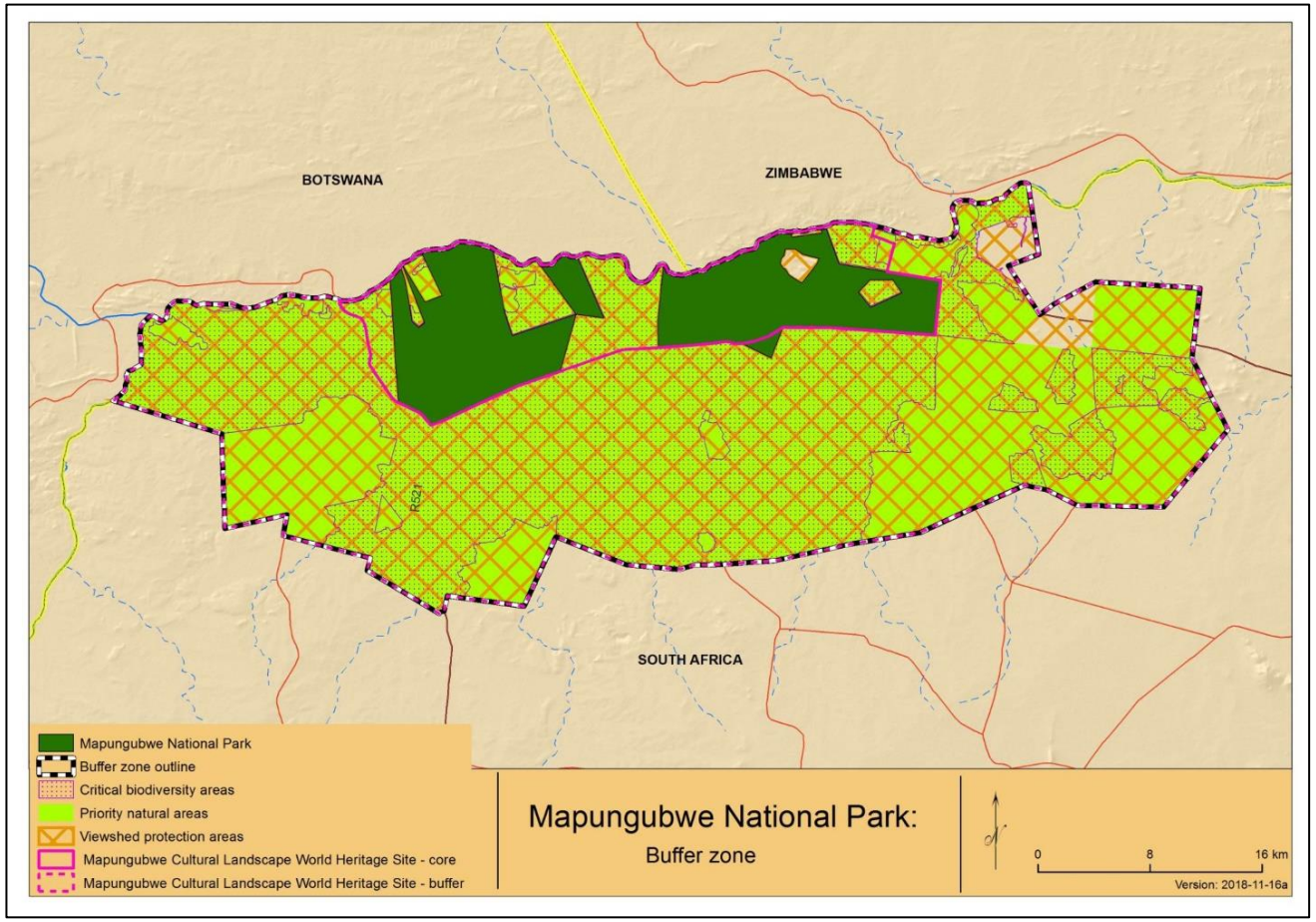


Figure 4-14: The extent of the larger protection area of the Mapungubwe Cultural Landscape World Heritage Site.

5 RESULTS: ARCHAEOLOGICAL SURVEY

5.1 The Off-Site Desktop Survey

In terms of heritage resources, the MCL is pointedly well-known for its Iron Age Farmer archaeology related to State Formation in Iron Age Farmer communities of southern Africa. As a result, the landscape has seen intensive archaeological research over a period of more than 80 years and research, commercial and popular publications on the MCL are ample. The Bismarck project landscape is no exception where a significant Middle Iron Age site on the farm Skutwater formed the focus of an MA dissertation by Van Ewyk in the 1980s'. The Skutwater site, situated no more than 2km north of the Bismarck Iron Age clusters discussed later in this Section, dated to the first half of the 12th century AD and it was composed of a mound of cultural debris which rised to a height of 1.75 meters. The mound covered an area of approximately 1.04 hectares where a centrally located deposit of dung was surrounded by surface scatters of cultural material related to domestic activities. The site follows what is known as the "Central Cattle Pattern" (CCP), representing the relationships between the physical components of a settlement in terms of concepts such as status, life forces and kinship. According to this pattern, the centre of the settlement, the domain of men, encompasses cattle byres where men and other important people are buried, as well as sunken grain pits or raised grain bins for long term storage, a public smithing area, and an assembly area where men resolve disputes and make political decisions. The outer residential zone, the domain of married women, incorporates the households of individual wives with their private sleeping houses, kitchen, grain bins and graves (Huffman 2001). The Skutwater mound contained an abundance of fragmented dung nodules and rich material culture deposits enabling Van Ewyk to conduct detailed ceramic analysis and classification of the site. He also encountered numerous dagha hut floors, stone granary stands and other contextual features reflecting the essentially sedentary nature of the occupation.

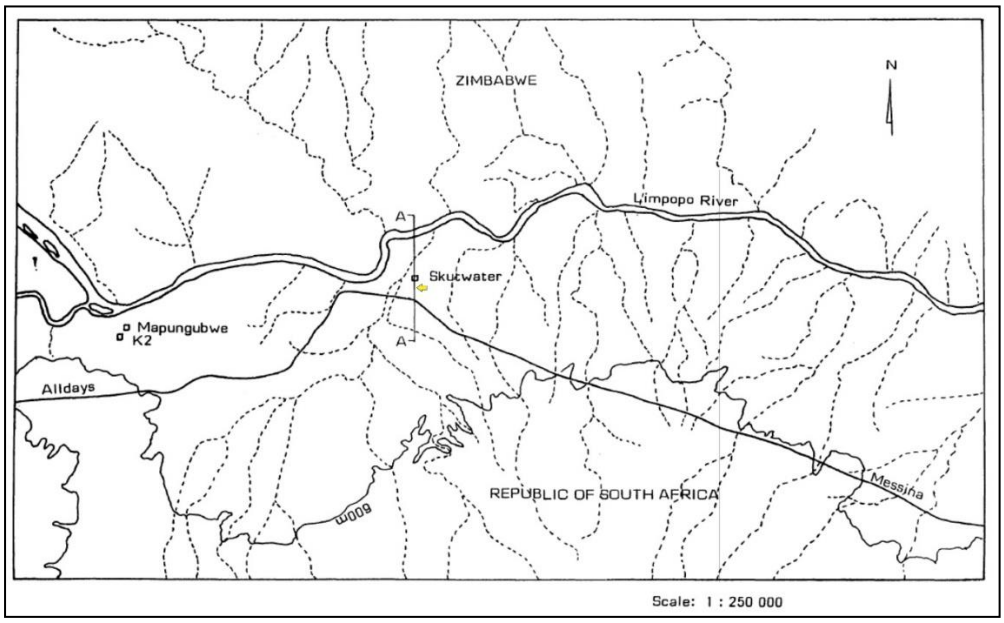


Figure 5-1: Map of the location of the Skutwater site with the Bismarck Iron Age settlements indicated by the yellow arrow (adapted from Van Ewyk 1987).

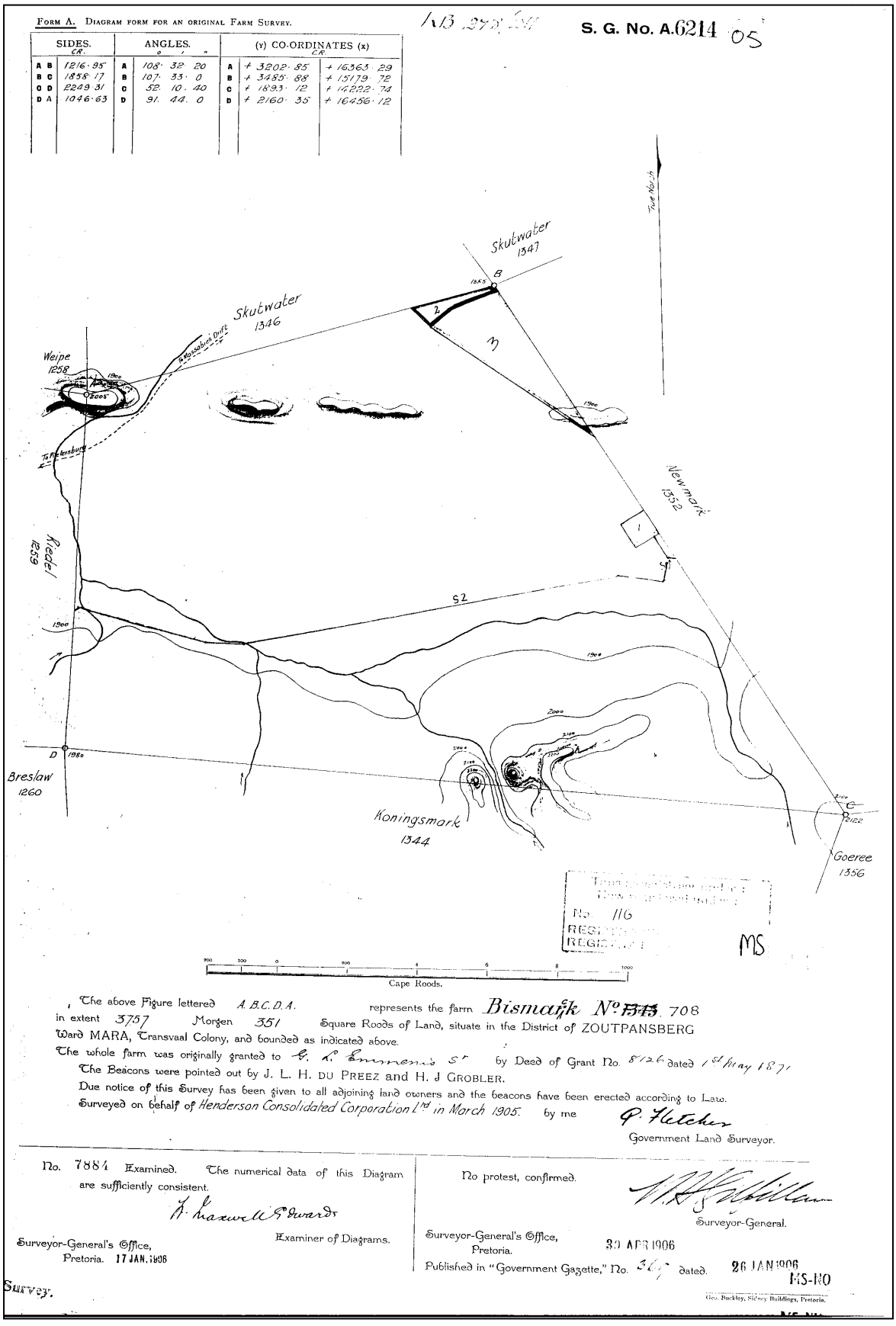
Van Ewyk identified the Skutwater people as a single, homogeneous Iron Age community practicing a mixed farming economy based on agriculture and animal husbandry. These activities were supplemented by hunting and gathering; exploiting wild faunal and floral food resources. They were largely self-sufficient as the only imports identified were metals and glass beads. He indicated that there was a clear social, economic

and political relationship between the Skutwater people and the Mapungubwe phase of the Greefswald sequence. At the time, Van Ewyk noted that a lack of data relating to the pattern of site sizes and distributions in the Skutwater region and contemporaneous with Mapungubwe precluded the identification of a definitive hierarchical structure in the landscape where a sphere of influence and the possible privileges enjoyed by commoner sites and Mapungubwe itself was not clear. However, he illustrated that Skutwater was subject to a degree of control under Mapungubwe at the hand of three aspects: the size of the site; its spatial organisation within the CCP and the ratio of exploitation of domesticated retative to non-domesticated faunal and floral food resources.

As discussed later in this Section, the Skutwater research acts as an effective departure point for the investigation of the Bismarck Iron Age settlements since the Bismarck sites share almost identical features with Skutwater.

An analysis of historical aerial imagery and archive maps of the Bismarck area reveals the following (see Figure 5-2 to Figure 5-6):

- The farms Bismarck, Weipe, Skutwater and Koningsmark are indicated on an early map of the Soutpansberg (Jeppe, 1899) and title deeds for the farms indicate that they were surveyed at the beginning of the 20th century.
- A number of so-called “huts” and the Goedehoop farmstead is indicated on a 1967 map and another farmstead, indicated as “Bismarck” appears on a 1980 topographic map of Goedehoop. These maps indicate vast cultivated fields across the property.
- Aerial imagery dating to 1937 and 1952 indicate a landscape generally devoid of man-made structures and features but vegetation clearings where Iron Age farmer settlements occurred are visible throughout.
- The Bismarck Farmstead appear within the project area on topographic maps dating to 1968 and 1980.



FORM A. DIAGRAM FORM FOR AN ORIGINAL FARM SURVEY.

S. G. No. A.6214 05

SIDES. CR.			ANGLES. ° ′ ″			(y) CO-ORDINATES (x) CR.			
A	B	1216·95	A	108	32	20	A	+ 3202·85	+ 16363·29
B	C	1858·17	B	107	33	0	B	+ 3485·88	+ 15179·72
C	D	2249·31	C	52	10	40	C	+ 1893·12	+ 14222·74
D	A	1046·63	D	91	44	0	D	+ 2160·35	+ 16456·12

Skutwater 1347
Skutwater 1346
Weipe 1258
Road to Potgietersrust
Road 1359
Newmark 1352
S2
Breslaw 1260
Koningsmark 1344
Goeree 1356
Cape Roods.

The above Figure lettered A.B.C.D.A. represents the farm Bismarck No. ~~345~~ 708
in extent 3757 Morgen 351 Square Roods of Land, situate in the District of ZOUTPANSBERG
Ward MARA, Transvaal Colony, and bounded as indicated above.
The whole farm was originally granted to G. L. Emmens &c. by Deed of Grant No. 8126 dated 1st May 1871
The Beacons were pointed out by J. L. H. DU PREEZ and H. J GROBLER.
Due notice of this Survey has been given to all adjoining land owners and the beacons have been erected according to Law.
Surveyed on behalf of Henderson Consolidated Corporation Ltd in March 1905. by me P. Fletcher
Government Land Surveyor.

No. 7884 Examined. The numerical data of this Diagram are sufficiently consistent.
A. Maxwell Edwards
Examiner of Diagrams.
Surveyor-General's Office, Pretoria. 17 JAN. 1906

No protest, confirmed.
Surveyor-General.
Surveyor-General's Office, Pretoria. 30 APR 1906
Published in "Government Gazette," No. 34[illegible] dated. 26 JAN 1906

Survey.

MS-NO

Geo. Buckley, Sidney Buildings, Pretoria.

Figure 5-2: Title Deed for the farm Bismarck dating to 1905.

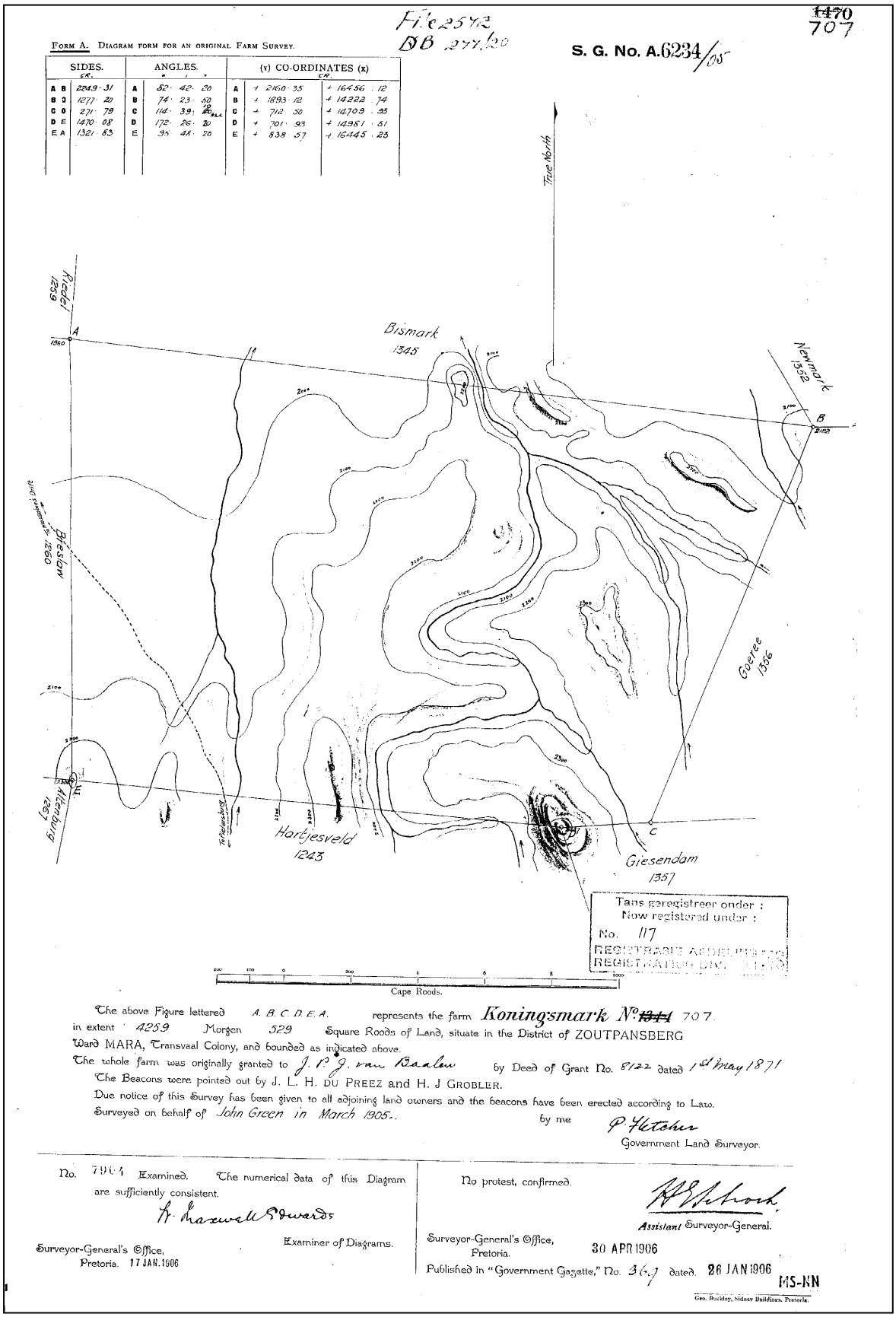
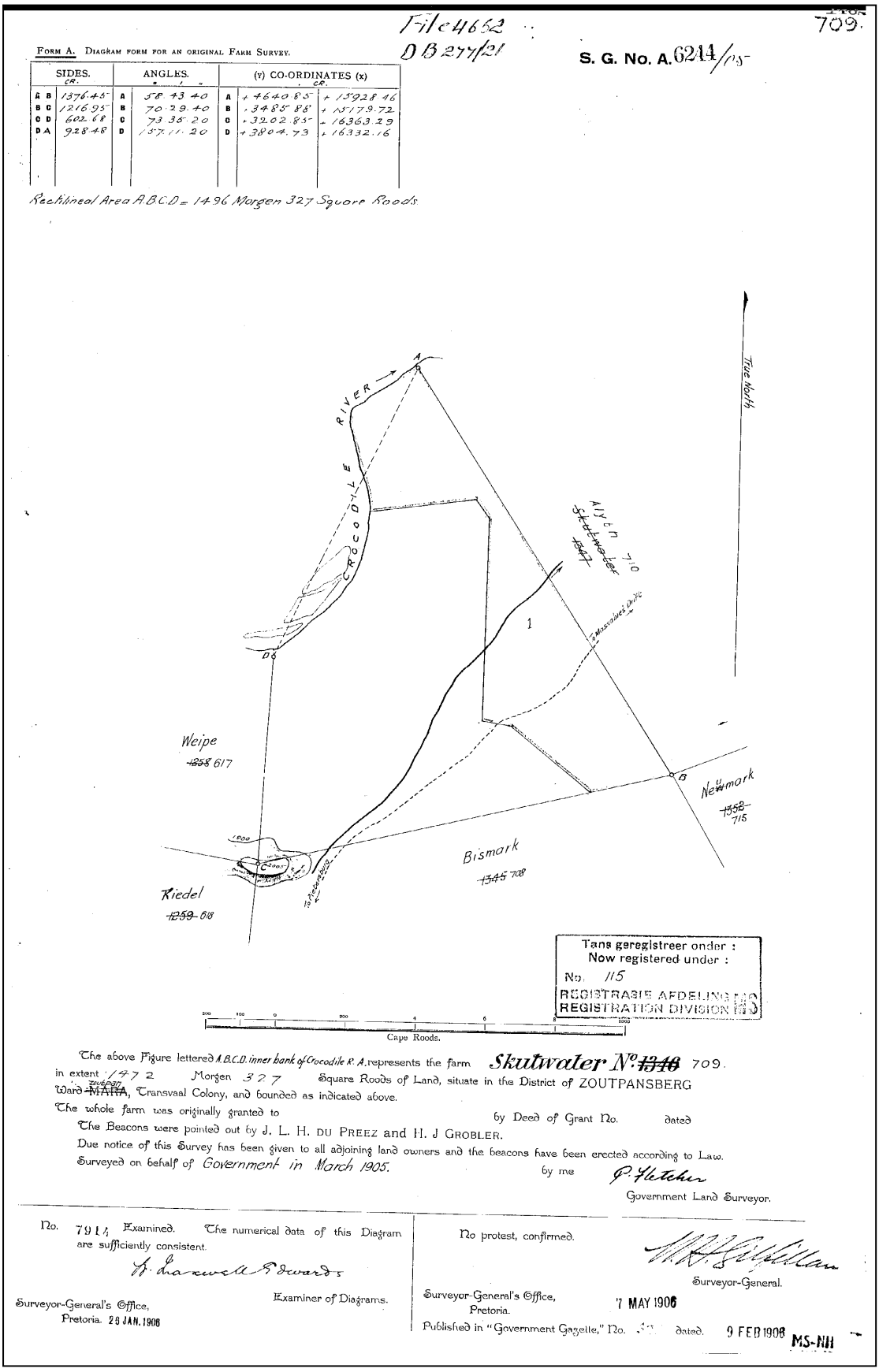


Figure 5-3: Title Deed for the farm Koningsmark dating to 1906.



File 4652
DB 277/21
709.

FORM A. DIAGRAM FORM FOR AN ORIGINAL FARM SURVEY.

S. G. No. A. 6244/05

SIDES.		ANGLES.		(y) CO-ORDINATES (x)		
	CR.	° ' "		CR.	
A B	1376.45	A 58 43 40	A	+ 46408.5	+ 13928.46
B C	1216.95	B 70 29 40	B	+ 3485.88	+ 15179.72
C D	602.68	C 73 35 20	C	+ 3202.85	+ 16363.29
D A	928.48	D 157 11 20	D	+ 3804.73	+ 16332.16

Rectilineal Area A.B.C.D = 1496 Morgen 327 Square Roods

Tans geregistreer onder :
Now registered under :
No. 115
REGISTRASIE AFDELING NS
REGISTRATION DIVISION NS

The above Figure lettered A.B.C.D. inner bank of Crocodile R. A. represents the farm **Skutwater No. ~~1346~~ 709**
in extent 1472 Morgen 327 Square Roods of Land, situate in the District of ZOUTPANSBERG
Ward ~~MARA~~ Zoutpan, Transvaal Colony, and bounded as indicated above.
The whole farm was originally granted to by Deed of Grant No. dated
The Beacons were pointed out by J. L. H. DU PREEZ and H. J GROBLER.
Due notice of this Survey has been given to all adjoining land owners and the beacons have been erected according to Law.
Surveyed on behalf of Government in March 1905. by me P. Fletcher
Government Land Surveyor.

No. 7914 Examined. The numerical data of this Diagram are sufficiently consistent.
H. Maxwell Edwards
Examiner of Diagrams.
Surveyor-General's Office, Pretoria. 28 JAN. 1908

No protest, confirmed.
Surveyor-General.
Surveyor-General's Office, Pretoria. 7 MAY 1908
Published in "Government Gazette," No. ... dated 9 FEB 1908 MS-NH

Figure 5-4: Title Deed for the farm Skutwater dating to 1906.

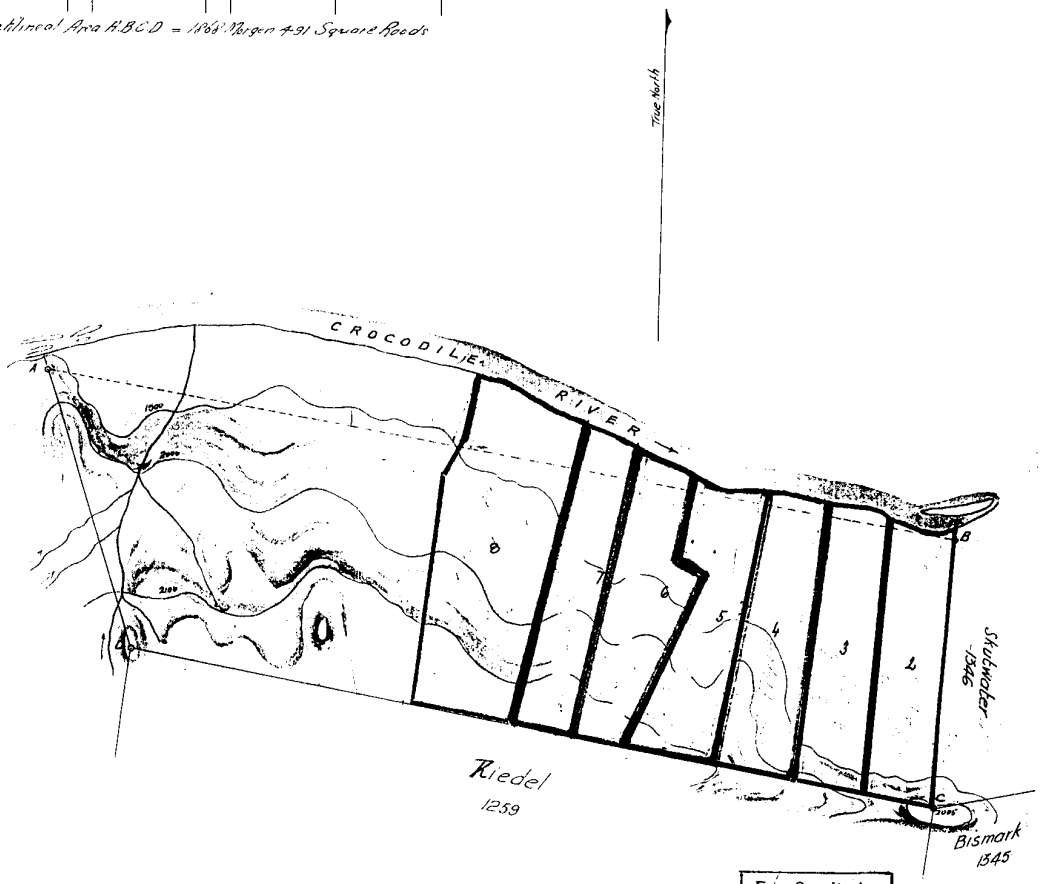
File 2527
DB 277/19

FORM A. DIAGRAM FORM FOR AN ORIGINAL FARM SURVEY.

S. G. No. A. 6248/08

SIDES.		ANGLES.		(y) CO-ORDINATES (x)		
A B	2041.21	A	62 - 32 0	A	+ 4111.63	+ 18348.70
B C	602.68	B	95 - 46 30	B	+ 3804.73	+ 16332.16
C D	1806.29	C	83 - 15 30	C	+ 3202.85	+ 16963.29
D A	641.30	D	118 - 26 10	D	+ 3507.30	+ 18114.34

Rectilineal Area A.B.C.D = 1866 Morgen 4.91 Square Roods



For Servitudes Deductions and Endorsements See Over.

Tans geregistreer onder : Now registered under :
No. 47
REGISTRASIE AFDELING
REGISTRATION DIVISION MS

Cape Roods.

The above Figure lettered A. inner bank of Crocodile R. B.C.D.A. represents the farm Weipe No. ~~1258~~ 617.
in extent 2227 Morgen 29 Square Roods of Land, situate in the District of ZOUTPANSBERG
Ward MARA, Transvaal Colony, and bounded as indicated above.
The whole farm was originally granted to J.C. Roen by Deed of Grant No. 6322 dated 16th Nov 1870
The Beacons were pointed out by J. L. H. DU PREEZ and H. J GROBLER.
Due notice of this Survey has been given to all adjoining land owners and the beacons have been erected according to Law.
Surveyed on behalf of ~~Henderson Consolidated Corporation Ltd~~ Henderson Transvaal Estates Ltd in March 1905. by me P. Fletcher
Government Land Surveyor.

P.F

No. 7919 Examined. The numerical data of this Diagram are sufficiently consistent.
R. Maxwell Edwards
Examiner of Diagrams.
Surveyor-General's Office, Pretoria. 27 JAN. 1906

No protest, confirmed.
Surveyor-General.
Surveyor-General's Office, Pretoria. 7 MAY 1906
Published in "Government Gazette," No. 371 dated 19 FEB 1906

Figure 5-5: Title Deed for the farm Weipe dating to 1906.

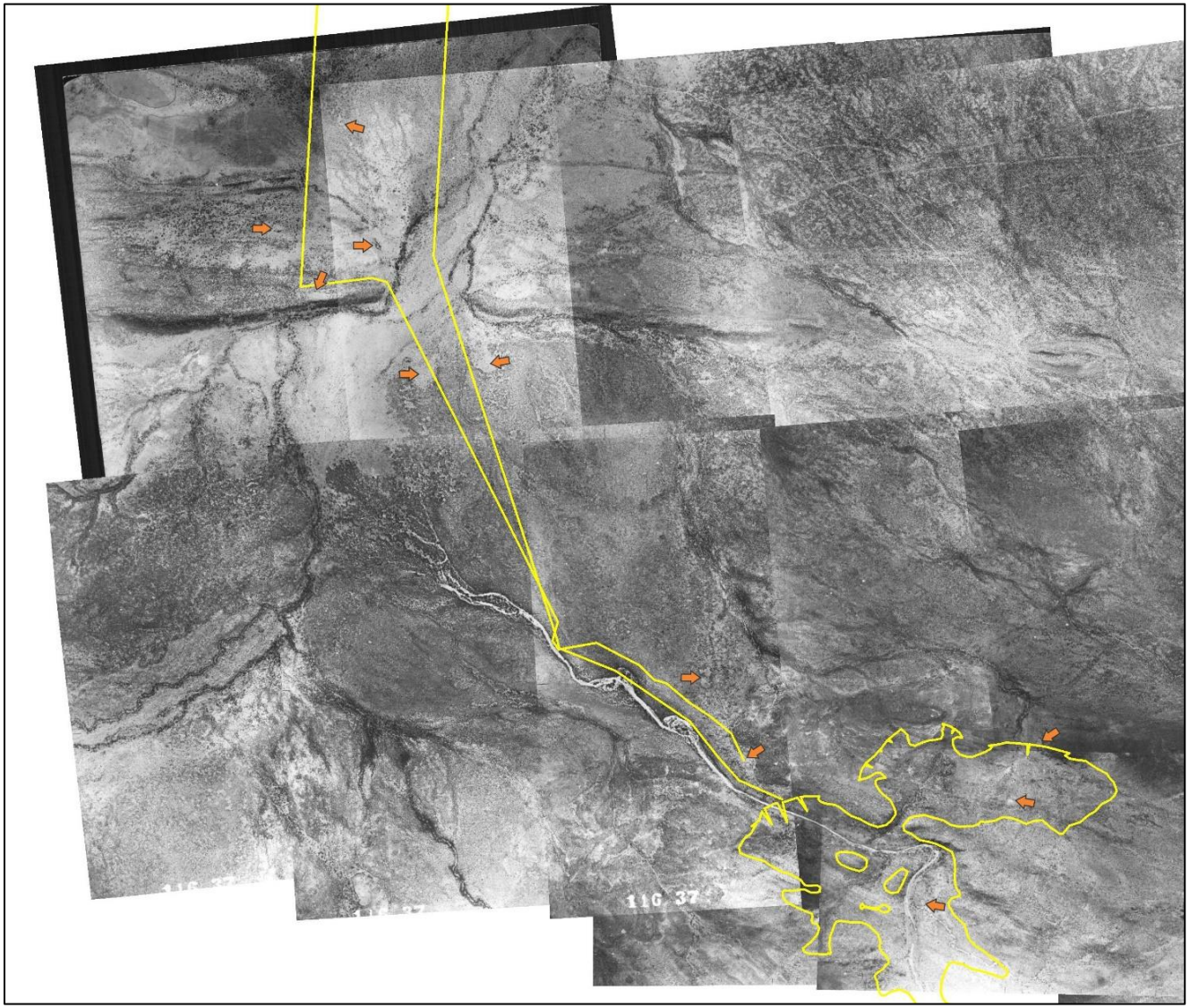


Figure 5-6: An aerial image of the project components dating to 1938 (yellow outline) indicating the presence of potential man-made structures or features (orange arrows).

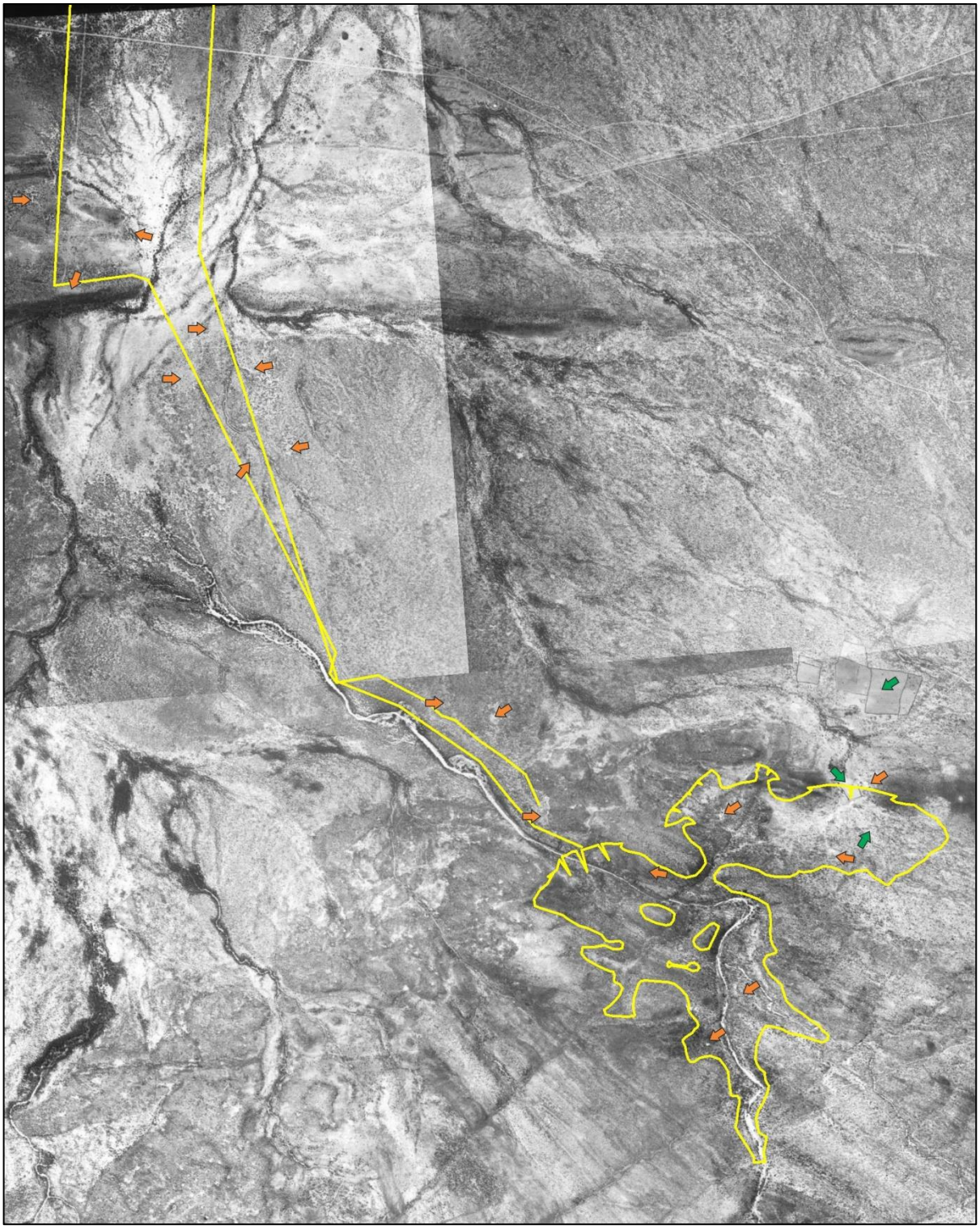


Figure 5-7: An aerial image of the project components dating to 1952 (yellow outline) indicating the presence of potential man-made structures or features (orange arrows) and agricultural fields (green arrows).

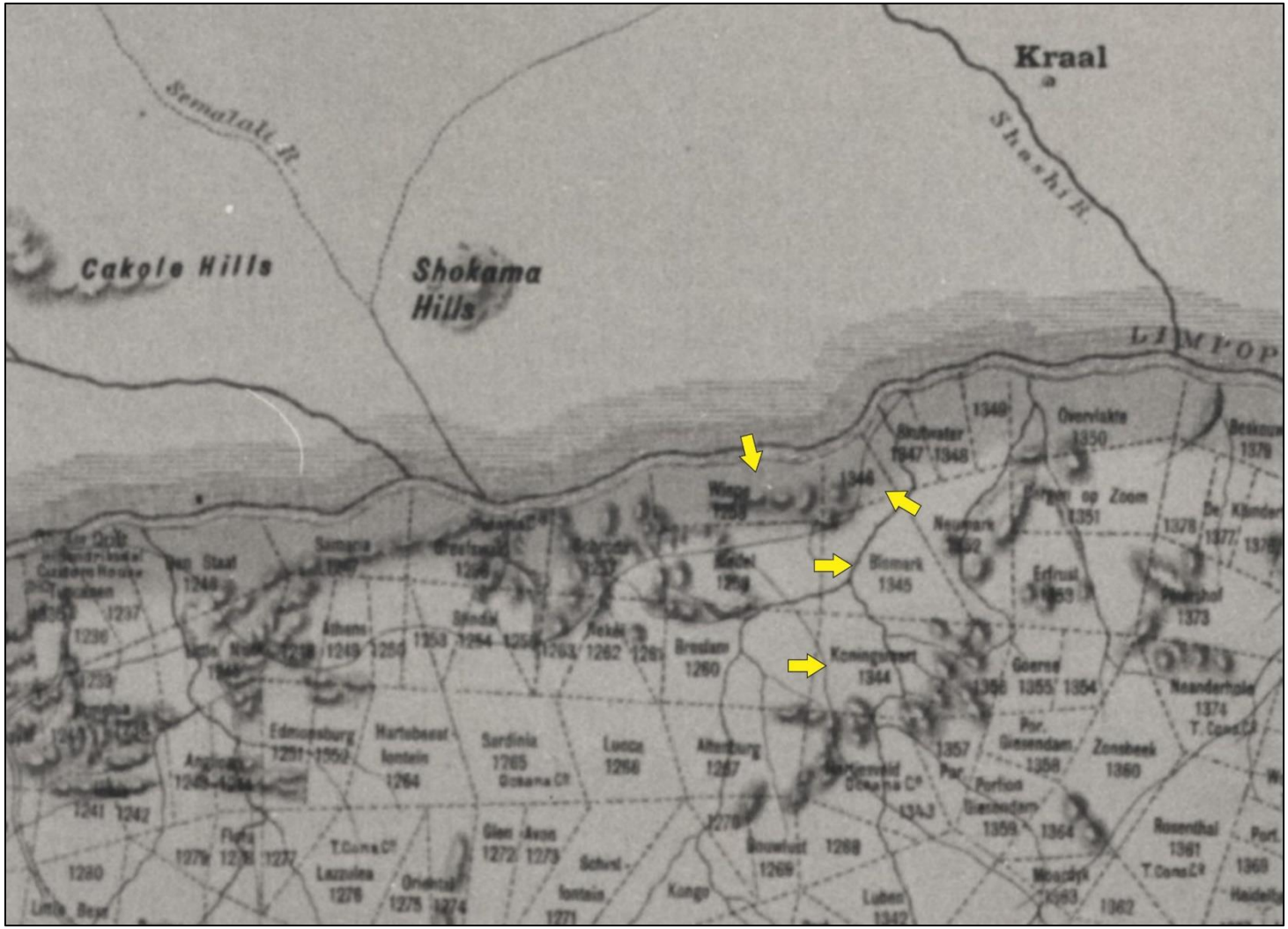


Figure 5-8: Historical map of the southern Soutpansberg dating to 1899 (Jeppe) indicating the presence of the project properies.

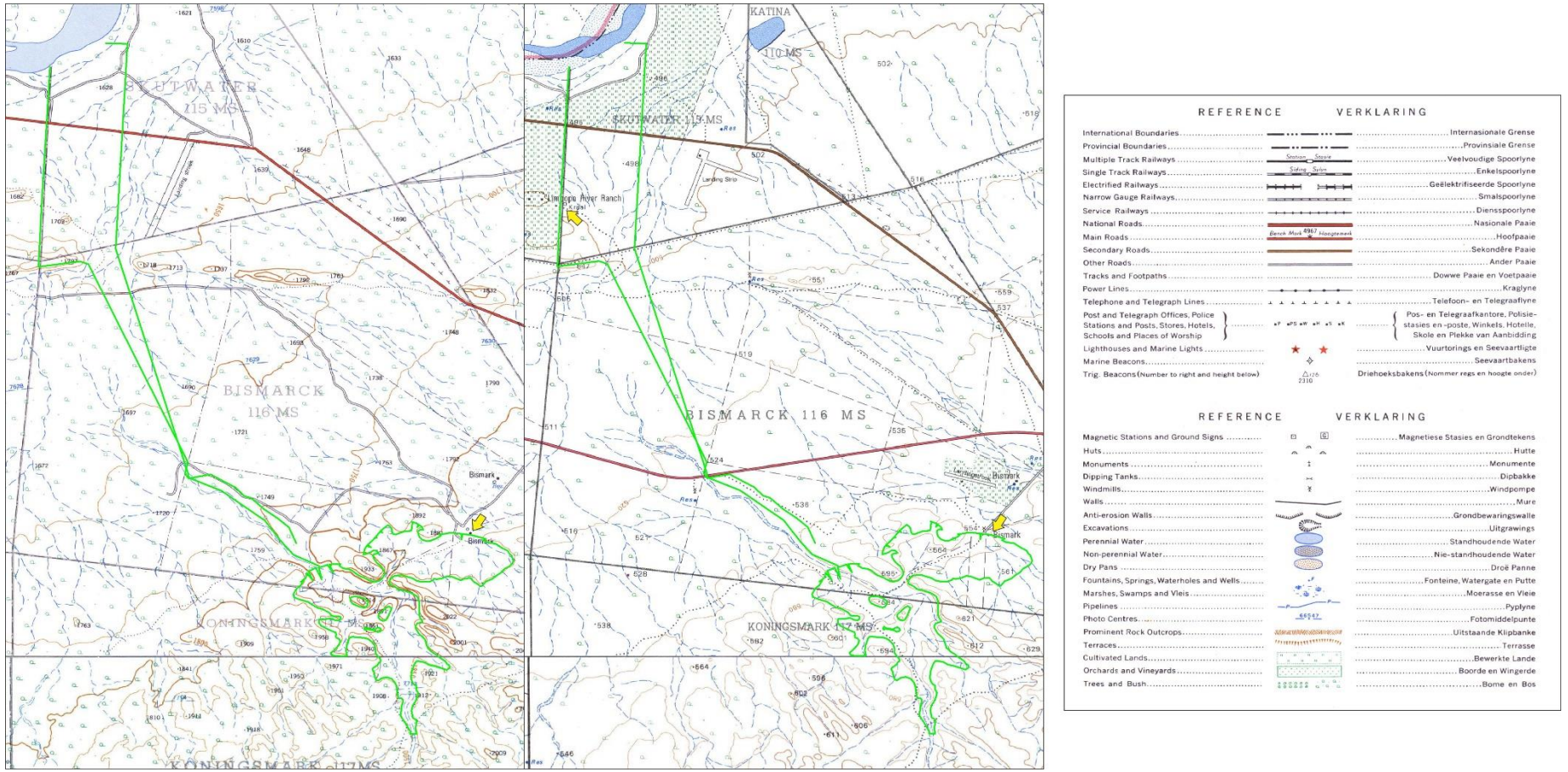


Figure 5-9: Historical topographic maps of the project area dating to 1967 (left) and 1980 (right) indicating the location of the project area (green outline) in the past decades. Man-made features are indicated by yellow arrows.

5.2 The Archaeological Site Survey

The field assessment subject to this study identified Middle and Later Stone Age localities, wide-spread Iron Age Farmer, Historical Period remnants as well as burial sites. The following observations were made during the site survey:

5.2.1 Stone Age Localities

Stone Age remains occur abundantly in the Limpopo landscape where locally available raw material for the manufacture of stone tools is available in the geological setting. Similar, the field assessment located Stone Age archaeological material in project areas. In all instances, the density of the material scatters was arbitrarily estimated by placing a one-meter drawing frame, sub-divided into quadrants, on a randomly-selected area displaying higher amounts of surface lithics. By plotting the counts of all lithic elements present in the 1x1 metre square relative density per m^2 was established and rated on a scale of low (<10), medium (10-20) and high (>20). This method has been adapted as expedient and non-invasive sampling technique that is particularly useful in value assessment of lithic occurrences during Phase 1 AIA's (see Van Der Ryst 2012).

- **Exigo-BIS-S1 MSA Scatter**
  Farms Bismarck: S22.23837° E29.57587°
  Field Rating: 3. Medium significance

A wide-spread scatter of Stone Age artefacts was observed in medium densities along a drainage channel and eroded surfaces in the proposed Bismarck Dam footprint. Most of the artefacts are probably Middle Stone Age lithics such as blades and scrapers but possible Later Stone Age (LSA) microlithic tools were noted. Artefacts observed in this area include both residue and debris, and formal MSA tools such as scrapers, points, blades, prepared cores, awls and residue flakes. Various degrees of weathering and patination on the surface of the lithics indicate that they have been transported by water and have lain on the surface of the landscape for varying lengths of time. The tools were manufactured from, amongst others, banded iron stone, hornfels, fine-grained dolerite as well as Cryptocrystalline Silicas (CCS) including quartzes, chalcedony and mudstones. The lithics seem to be largely surface occurrences and mixing of artefacts caused by the erosion of the drainage lines probably compromised the context of artefacts. The large numbers of diagnostic artefacts mean that these archaeological remains have been assigned a medium archaeological significance. Mitigation of the site is required during early stages of the project.

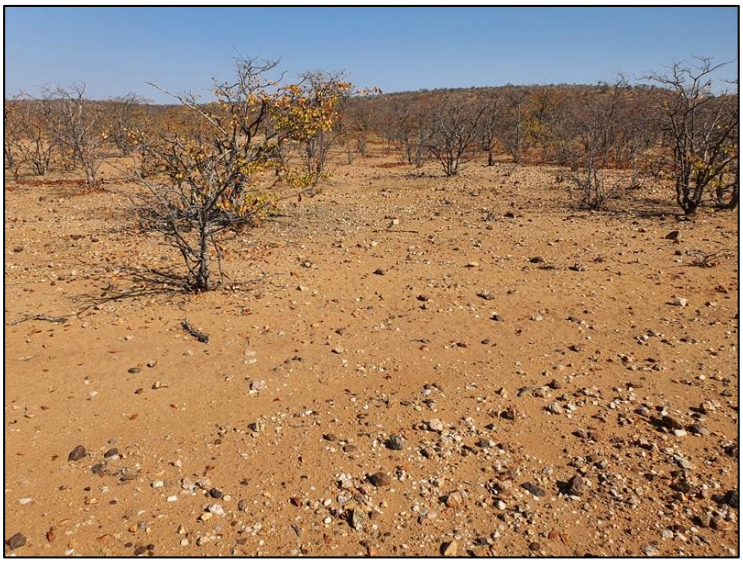


Figure 5-10: View of Site EXIGO-BIS-S1.

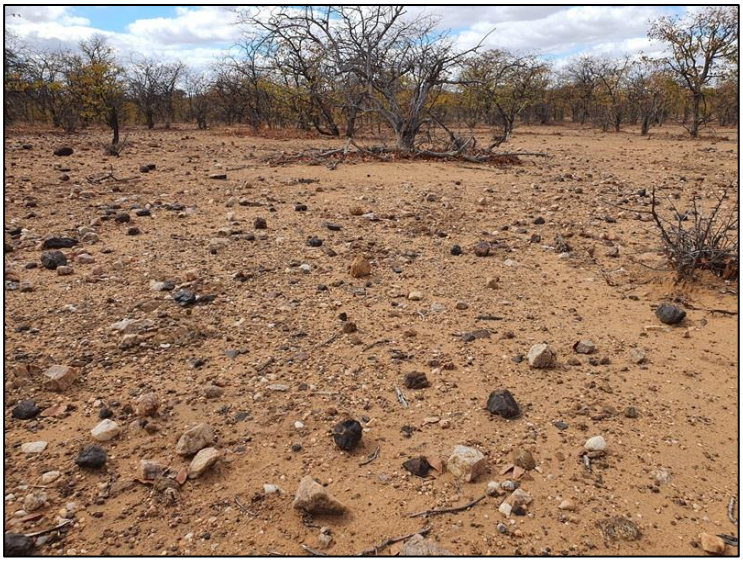


Figure 5-11: View of surfaces where lithics were found at Site EXIGO-BIS-S1.

Figure 5-12: MSA lithics from Site EXIGO-BIS-S1.

Figure 5-13: An awl (left) and a blade from Site EXIGO-BIS-S1.

Figure 5-14: MSA lithics from Site EXIGO-BIS-S1.

Figure 5-15: MSA lithics from Site EXIGO-BIS-S1.

Figure 5-16: MSA lithics from Site EXIGO-BIS-S1.

Figure 5-17: MSA points from Site EXIGO-BIS-S1.

Figure 5-18: View of MSA lithics from Site EXIGO-BIS-S1.

- **Exigo-BIS-S2 MSA Scatter**
  Farms Bismarck: S22.25013° E29.57223°
  Field Rating: 3. Medium significance

Another medium density Stone Age artefact scatter was observed in along a drainage channel in the proposed Bismarck Dam footprint. The artefacts display MSA characteristics and possible Later Stone Age (LSA) microlithic tools were noted. Artefacts documented here include both residue and debris, and formal MSA tools such as scrapers, points, blades, prepared cores and residue flakes. A large quantity of awls was noted in this surface assemblage. Various degrees of weathering and patination on the surface of the lithics indicate that they have been transported by water and have lain on the surface of the landscape for varying lengths of time. The tools were manufactured from, amongst others, banded iron stone, hornfels, fine-grained dolerite as well as Cryptocrystalline Silicas (CCS) including quartzes, chalcedony and mudstones. The lithics seem to be largely surface occurrences and mixing of artefacts caused by the erosion of the drainage lines probably compromised the context of artefacts. The large numbers of diagnostic artefacts mean that these archaeological remains have been assigned a medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-19: View of a drainage line at Site EXIGO-BIS-S2.

Figure 5-20: MSA lithics from Site EXIGO-BIS-S2.

Figure 5-21: MSA lithics from Site EXIGO-BIS-S2.

Figure 5-22: Highly weather MSA point from Site EXIGO-BIS-S2.

Figure 5-23: A selection of MSA lithics from Site EXIGO-BIS-S2.

Figure 5-24: A selection of MSA awls from Site EXIGO-BIS-S2.

Figure 5-25: A selection of broken MSA points from Site EXIGO-BIS-S2.

Figure 5-26: A selection of MSA lithics from Site EXIGO-BIS-S2.

Figure 5-27: MSA scarpers from Site EXIGO-BIS-S2.

5.2.2 Iron Age Farmer Representations

The study identified wide-spread Iron Age Farmer settlement remains representative of the Transitional K2 (TK2), K2 and Khami periods.

- **Exigo-BIS-C1 Iron Age Farmer Settlement Cluster**
  Farm Bismarck: S22.24106° E29.57891°
  Field Rating: 3. Medium significance

An Iron Age Farmer occupation area was located in the proposed Bismarck Dam footprint. At the core of the occupation area is the remains a cattle kraal measuring approximately 35m x 30m which contains vitrified cattle dung, potsherds and faunal remains on the surface. A number of stone granary stands surround the cattle kraal and a large circular stone foundation structure occurs directly east of the kraal. Single stone foundation features link this circular structure to smaller stone circles. Two elongated stone cairns, possible graves (**Site Exigo-BIS-B2**) occur within the context of these stone features. A number of shallow ash deposits

and ash lenses containing domestic refuse such as potsherds and faunal remains are scattered across areas surrounding the cattle kraal. There is a high probability that unmarked graves might being present at this site. This settlement probably dates to the either the terminal stages of the Middle Iron Age, or the early parts of the Later Iron Age at around 1400 AD, known as the Khami Period. This temporal interpretation is based on the following observations:

- Stone walling: The Khami Period is characterised by an increased use of stone wall building to demarcate space and to fulfill various site fuiunctions. When compared to earlier TK2 and K2 sites noted in the project area, Site Exigo-BIS-C1 appears to be distinctly different where stone walling is mostly absent from the TK2 and K2 sites.
- The regional context: Considering the location of the site on the Limpopo River in the larger archaeological landscape, the site was probably occupied by early Shona speakers after the demise of the Mapungubwe Kingdom.
- Diagnostic pottery: Pottery fragments recovered from surface areas display similarities to Khami ceramics**.** The potsherds generally display decoration motives such as punctuated, stabbed and incised decorations and exterior surfaces have also been coloured using ochre and graphite composites. These motives are similar to that of the Khami Ceramic tradition, dating to the 14th – 15th century AD (see Section 4.2.2 iv.).

The occurrence is significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-28: View of a cattle kraal area at EXIGO-BIS-C1.

Figure 5-29: View of a stone feature at EXIGO-BIS-C1.

Figure 5-30: View of a large circular stone feature at EXIGO-BIS-C1.

Figure 5-31: Ceramic shards from EXIGO-BIS-C1.

Figure 5-32: A selection of possible Khami decorated pottery from EXIGO-BIS-C9.

Figure 5-33: A broken lower grindstone from EXIGO-BIS-C1.

- **Exigo-BDP-C2 Iron Age Farmer Settlement Cluster**
  Farm Bismarck: S22.23562° E29.57882°
  Field Rating: 3. Medium significance

An Iron Age Farmer occupation area occurs near a large drainage line in the proposed Bismarck Dam footprint. The occupation area consists out of a centrally located deposit of vitrified cattle dung measuring approximately 80m x 65m which contains potsherds and faunal remains on the surface. At the site, burnt hut remains containing clearly defined imprints of wooden poles, burnt granary remains and a large number of stone granary stands were noted surrounding the cattle kraal. A large ash midden containing domestic waste occurs at the site. The Bismarck farmstead (**Site Exigo-BIS-H1**) was constructed over a part of the ash midden and the cattle kraal during the past century. There is a high probability that unmarked graves might be present at this site. This settlement probably dates to the TK2 Period dating to circa AD 1200 during the Middle Iron Age where fragments of recurved jars with hatched triangles in the neck, hatched bands and upright incised triangles in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. The presence of burnt granary floors / walls at this site might point to a unique cultural response to drought conditions during the Middle Iron Age, where burnt daga structures are said to be the result of cleansing rituals for drought as part of a larger rain making belief system among K2/ Mapungubwe communities (Huffman 2009). The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-34: View of a cattle kraal area at EXIGO-BIS-C2.

Figure 5-35: View of a large midden at EXIGO-BIS-C2.

Figure 5-36: View of ashy soil at the midden at EXIGO-BIS-C2.

Figure 5-37: Ceramic shards from EXIGO-BIS-C2.

Figure 5-38: Decorated ceramic shards from EXIGO-BIS-C2.

Figure 5-39: Ceramic shards from EXIGO-BIS-C2.

Figure 5-40: A selection of TK2-type decorated pottery from EXIGO-BIS-C2.

Figure 5-41: View of vitrified cattle dung at EXIGO-BIS-C2.

Figure 5-42: Burnt hut remains at EXIGO-BIS-C2.

- **Exigo-BDP-C3 Iron Age Farmer Settlement Cluster**
  Farm Bismarck: S22.23724° E29.55825°
  Field Rating: 3. Medium significance

Another Iron Age Farmer occupation area occurs directly east of the Kongoloop tributary along the proposed Bismarck Dam pipeline alignment. The occupation area consists out of central vitrified cattle dung deposit measuring approximately 60m x 65m which contains potsherds and faunal remains on the surface. At the site, burnt hut remains, burnt granary remains and a large number of stone granary stands were noted surrounding the cattle kraal. A number of smaller ash middens and as lenses containing domestic waste occuuirs at the site. There is a high probability that unmarked graves might be present at this site. This

settlement probably dates to the TK2 Period dating to circa AD 1200 during the Middle Iron Age where fragments of recurved jars and beakers with hatched triangles in the neck, hatched bands and upright incised triangles in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites with a frequent use of a highly visible course gravel temper in the walls of the shards. A fragment of a beaker indicates decorations along the base of the potsherd. As noted previously, the presence of burnt granary floors / walls at this site might point to a cultural response to drought conditions during the Middle Iron Age, where burnt daga structures are said to be the result of cleansing rituals for drought as part of a larger rain making belief system among K2/ Mapungubwe communities. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-43: View of a cattle kraal area at EXIGO-BIS-C3.

Figure 5-44: View of a stone granary stand structure at EXIGO-BIS-C3.

Figure 5-45: View of a stone granary stand structure at EXIGO-BIS-C3.

Figure 5-46: Burnt granary wall remains at EXIGO-BIS-C3.

Figure 5-47: View of a stone feature at EXIGO-BIS-C3.

Figure 5-48: Ceramic shards from EXIGO-BIS-C3.

Figure 5-49: A ceramic beaker decorated along its base from EXIGO-BIS-C3.

Figure 5-50: View temper on a potsherd from EXIGO-BIS-C3.

Figure 5-51: A selection of TK2-type decorated pottery from EXIGO-BIS-C3.

- **Exigo-BDP-C4 Iron Age Farmer Settlement Cluster**
  Farm Bismarck: S22.23137° E29.55520°
  Field Rating: 3. Medium significance

Another large Iron Age Farmer occupation area occurs directly east of the Kongoloop tributary along the proposed Bismarck Dam pipeline alignment. The site is composed of three ash mounds where the largest, rises to a height of approximately 2 meters above the flat sandy plain in the general surroundings. The largest of the mounds is more or less circular in plan and has an average diameter of 90 meters. A trench has been excavated into the mound in recent years extracting large quantities of pottery and animal bone from subsurface deposits. Cattle dung and cultural material related to domestic activities occur at the other mounds and in the general landscape and stone granary stands occur across the site. This settlement probably dates to the K2 Period dating to circa AD 1000/1030 where fragments of recurved jars and beakers with hatched triangles in the neck, hatched bands and upright incised triangles and comb stamps in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-52: View of a large midden at EXIGO-BIS-C4.

Figure 5-53: View of a trench that was excavated into the large midden at EXIGO-BIS-C4.

Figure 5-54: View of ash and cultural material from the large midden at EXIGO-BIS-C4.

Figure 5-55: Ceramic shards from EXIGO-BIS-C4.

Figure 5-56: A selection of TK2-type decorated pottery from EXIGO-BIS-C4.

Figure 5-57: View of a stone granary stand structure at EXIGO-BIS-C4.

- **Exigo-BDP-C5 Iron Age Farmer Cattle Kraal Cluster**
  Farm BismarckS22.21974° E29.54557°
  Field Rating: 3. Medium significance

A cluster of a cattle kraals occur in Mopani Veld east of the Kongoloop tributary along the proposed Bismarck Dam pipeline alignment. These areas are characterized by wide-spread vitrified cattle dung deposits within vegetation clearings with the occurrence of irregular stone features and occasional material culture such as potsherds. The cattle kraals undoubtedly form part of the larger Iron Age settlement system in the immediate and larger landscape. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-58: View of a cattle kraal area at EXIGO-BIS-C5, note irregular stone features.

Figure 5-59: View of a cattle kraal area at EXIGO-BIS-C5.

Figure 5-60: View of a cattle kraal area at EXIGO-BIS-C5.

Figure 5-61: Ceramic shards from EXIGO-BIS-C5.

Figure 5-62: View of vitrified cattle dung from EXIGO-BIS-C5.

- **Exigo-BDP-C6 Iron Age Farmer Cattle Kraal Cluster**
  Farm Bismarck: S22.21332° E29.54171°
  Field Rating: 3. Medium significance

An Iron Age Farmer occupation area occurs east of the Kongoloop tributary along the proposed Bismarck Dam pipeline alignment. The site is composed of two prominent ash mounds where the largest rises to a height of approximately 1.5 meters above the Mopane Veld in the general surroundings. The largest of the mounds is more or less circular with an average diameter of 60 meters. Animal burrowing at the site has exposed large quantities of pottery, ostrich eggshell beads (OES) and animal bone from subsurface deposits. Cattle dung and cultural material related to domestic activities occur at the mounds and in the general landscape and stone granary stands occur across the site. This settlement probably dates to the TK2 Period dating to circa AD 1200 where fragments of recurved jars and beakers with hatched triangles in the neck, hatched bands and upright incised triangles and comb stamps in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-63: View of a cattle kraal area at EXIGO-BIS-C6.

Figure 5-64: View of a large midden at EXIGO-BIS-C6.

Figure 5-65: A ceramic shard on the surface at EXIGO-BIS-C6.

Figure 5-66: A selection of TK2-type decorated pottery and an OES bead from EXIGO-BIS-C6.

Figure 5-67: A selection of TK2-type decorated pottery from EXIGO-BIS-C6.

Figure 5-68: TK2-type decorated pottery and an OES bead from EXIGO-BIS-C6.

Figure 5-69: A selection of TK2-type decorated pottery from EXIGO-BIS-C6.

Figure 5-70: View of stone granary stand structures at EXIGO-BIS-C6.

- **Exigo-BDP-C7 Iron Age Farmer Cattle Kraal Cluster**
  Farm Bismarck: S22.20830° E29.53494°
  Field Rating: 3. Medium significance

An extensive Iron Age Farmer occupation area occurs along the floodplains of the Kongoloop tributary along the proposed Bismarck Dam pipeline alignment. The site stretches over an area of approximately 6ha where prominent ash mounds, cattle dung deposits and stone grain bin stands occur across the site. The largest of the mounds measures approximately 30m x 40m with a depositional depth of approximately 1.5m. Animal burrowing at the site has exposed large quantities of pottery, ostrich eggshell beads (OES) and animal bone from subsurface deposits. This settlement probably dates to the TK2 Period dating to circa AD 1200 where fragments of recurved jars and beakers with hatched triangles in the neck, hatched bands and upright incised triangles and comb stamps in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-71: View of a large midden at EXIGO-BIS-C7.

Figure 5-72: View of a large midden at EXIGO-BIS-C7.

Figure 5-73: Ceramic shards and an iron object from EXIGO-BIS-C7.

Figure 5-74: View of stone granary stand structures at EXIGO-BIS-C7.

Figure 5-75: A selection of TK2-type decorated pottery from EXIGO-BIS-C7.

- **Exigo-BDP-C8 Iron Age Farmer Cattle Kraal Cluster**
  Farm Bismarck: S22.20795° E29.53930°
  Field Rating: 3. Medium significance

Another large Iron Age Farmer occupation area occurs along the norther border of Bismarck along the proposed Bismarck Dam pipeline alignment. The site stretches over an area of approximately 4ha where prominent ash mounds, cattle dung deposits and stone grain bin stands occur across the site. The largest of the mounds measures approximately 50m x 50m with a depositional depth of approximately 1.5m. Extensive animal burrowing at the site has exposed large quantities of pottery, ostrich eggshell beads (OES) and animal bone from subsurface deposits. A number of upper grindstones were also noted at this site This settlement probably dates to the TK2 Period dating to circa AD 1200 where fragments of recurved jars and beakers with hatched triangles in the neck, hatched bands and upright incised triangles and comb stamps in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-76: View of a large midden at EXIGO-BIS-C8.

Figure 5-77: View of animal burrowing activity in the midden at EXIGO-BIS-C8.

Figure 5-78: View of a large midden at EXIGO-BIS-C8.

Figure 5-79: View of a cattle kraal area at EXIGO-BIS-C8.

Figure 5-80: View of stone granary stand structures at EXIGO-BIS-C8.

Figure 5-81: A selection of TK2-type decorated pottery from EXIGO-BIS-C8.

Figure 5-82: View of upper grindstones from EXIGO-BIS-C8.

- **Exigo-BDP-C9 Iron Age Farmer Settlement Cluster**
  Farm Bismarck: S22.20325° E29.52798°
  Field Rating: 3. Medium significance

A large Iron Age Period hilltop settlement occurs on a high ridge on the border of Bismarck and Skutwater along the proposed Bismarck Dam pipeline alignment. The site, measuring approximately 200m x 100m displays a dense surface scatter of cultural material such as decorated pottery, faunal remains, OES beads, metal objects and upper grind stones. In addition, large quantities of stone granary stands, stone platforms and stone cairns litter the site. Cupules and grinding hollows were noted in bedrock and large stones at the site. The entire western section of the site is deposited with vitrified cattle dung and a number of ash middens and lenses occur along the outer periphery of the site. This settlement probably dates to the TK2 Period dating to circa AD 1200 where fragments of recurved jars, bowls and beakers with hatched triangles in the neck, hatched bands and upright incised triangles and comb stamps in the neck were noted. Some of the potsherds have been coloured using ochre and graphite composites. Hilltop locations are typically elite residences and the size and location of the site suggests it to be the site of a regional headman, likely tied to the political dynasty of Mapungubwe. The occurrence if significant in terms of its cultural and archaeological representation within the MCL and it is of medium archaeological significance. Mitigation of the site is required during early stages of the project.

Figure 5-83: View of a cattle kraal area at EXIGO-BIS-C9.

Figure 5-84: View of a large midden at EXIGO-BIS-C9.

Figure 5-85: View of cupules on a stone at EXIGO-BIS-C9.

Figure 5-86: A TK2-type decorated potsherd and an OES bead from EXIGO-BIS-C9.

Figure 5-87: A selection of TK2-type decorated pottery from EXIGO-BIS-C9.

Figure 5-88: A selection of TK2-type decorated pottery from EXIGO-BIS-C9.

Figure 5-89: TK2-type decorated potsherds from EXIGO-BIS-C9.

Figure 5-90: A selection of TK2-type decorated pottery from EXIGO-BIS-C9.

Figure 5-91: A selection of TK2-type decorated pottery from EXIGO-BIS-C9.

- **Discussion: Bismarck Middle Iron Age Farmer Settlement**

Chronologically, the Bismarck sites date to the Middle Iron Age period and available evidence suggests that the sites have definite political, economic, and ritual links to Mapungubwe. The ceramic material from the sites suggest that the sites date to the Transitional K2 (TK2). This period is regionally significant since it coincides with the early phases of the occupation of Mapungubwe Hill (c. AD 1160 to 1230) and therefore the establishment of the Mapungubwe Kingdom. This period is intricately linked to the expansion of long-distance trade between the Indian Ocean networks and communities along the Limpopo. Outside the Shashi-Limpopo confluence area, very few TK2 sites have been excavated and to date, the Skutwater site (discussed earlier) situated immediately to the north of the Bismarck sites, remains one of the largest TK2 sites excavated outside the confluence area. The number of sites on Bismarck, however, clearly provides a new perspective on not only the Skutwater site, but also on the socio-political organisation of the region. It shows that Skutwater was neither isolated nor unique as is sometimes assumed, but instead, is one site of a complex settlement system. The distribution of material on the northern portions of Bismarck, suggests a spatially contiguous agricultural settlement along the edges of the alluvial fans. These fans were likely the

locations of dryland agricultural fields (probably sorghum and millets). These contrast to the sites on the Mopaneveld as one moves south, where there are several large 'kraal sites' – likely cattle posts. However, these kraal sites are not spatial isolates. Instead, they are part of a larger settlement system where complementary systems of stock keeping and agriculture form part of the whole. On a socio-political level, these sites are tied together by the large hilltop site on the north eastern corner of Bismarck. Hilltop locations are typically elite residences and the size and location of the site on Bismarck suggests it to be the site of a regional headman, likely tied to the political dynasty of Mapungubwe. The agricultural and cattle sites therefore likely form the "commoner" element with a ruling elite located on the hilltop site. As such, Bismarck is representative of populated landscape consisting out different segments of the same community with certain political, economic, and ritual links to Mapungubwe.

Many of the processes seen in the Shashi-Limpopo confluence around Mapungubwe are also evident on Bismarck. Huffman (2008), for example, identified a similar agricultural settlement arrangement around the wetland, which forms where the Kolope enters the Limpopo. Intensive exploitation of these agricultural areas is crucial to the development of the Mapungubwe kingdom. Extended to a regional scale, the Bismarck sites therefore likely fulfil a similar role in the larger socio-political process of state formation. Another important aspect of some of the sites is the presence of burnt down clay granaries. These likely relate to a phenomenon at other TK2 sites around Mapungubwe where granaries were purposefully set alight. The widely accepted hypothesis is that these events relate to cleansing rituals associated with severe droughts in the twelfth and thirteenth centuries occurrence of these features on Bismarck shows that this practice extended over a large region and demonstrates the clear ritual links within Mapungubwe society.

While it is widely acknowledged that state formation at Mapungubwe is linked to agricultural intensification, the land-use system itself remains poorly understood. The Bismarck sites occupy a key spatial position in the geopolitical world of thirteenth century Limpopo Valley, since they straddle the zone of interaction between the wider hinterland and the Mapungubwe heartland.

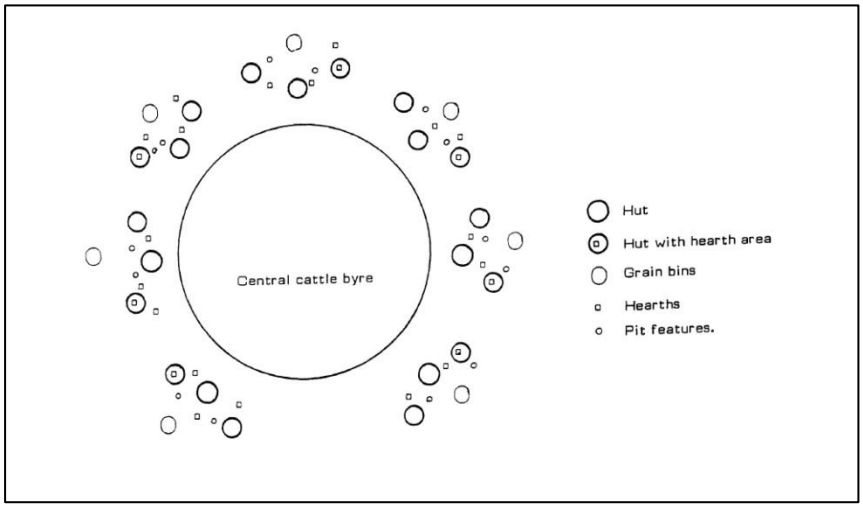


Figure 5-92: The CCP as described by Van Ewyk at Skutwater (Van Ewyk 1987).

5.2.3 Iron Age Farmer Representations (Other)

- **Exigo-BDP-T1 Bismarck Farmstead Remains**
  Farm Koningsmark: S22.24374° E29.56028°
  Field Rating: 2a. Low significance

A number of small stone terraces were documented on the northern slopes of a small ridge on the Farm Koningsmark line in the proposed Bismarck dam footprint area. The poorly preserved stone structures follow the slopes along contours to form a series of terraces and they probably indicate a Later Iron Age Farmer Period occupation / activity area. Preservation of the features is generally poor and associated Iron Age farmer Period material culture and other features are absent from this site. The site might be significant in terms of its regional and local representation in the Iron Age Farmer Period landscape of the area but it is rated as of low significance. The site is located within the demarcated footprint for the dam and mitigation of the site is required during early stages of the project.

Figure 5-93: View of poorly preserved stone terracing at EXIGO-BIS-Tq.

5.2.4 Historical Period Sites

- **Exigo-BDP-H1 Bismarck Farmstead Remains**
  Farm Bismarck: S22.23562° E29.57882°
  Field Rating: 2a. Low significance

The concrete foundation remains of a rectangular building, cement dam foundation, an ash midden as well as livestock feeding troughs were noted near a large drainage line in the proposed Bismarck dam footprint area. The site and its features occur within an Iron Age Farmer occupation site (**Site Exigo-BIS-C2**) and this has impacted prehistorical deposits and features at the site. An absolute temporal context for the farmstead of the could not be ascertained but it appears on an archive aerial photographs (1937, 1952) and it is indicted as “Bismarck” on a later topographical map (1967). The site is older than 60 years - and generally protected under the National Heritage Resource Act (NHRA 1999) but structures and features are poorly preserved and no notable heritage or historical association could be established. As such, the site is rated as of medium-low significate but its position within the sensitive medium significance Iron Age site Exigo-BIS-C2 should be noted. Mitigation of the site is required during early stages of the project.

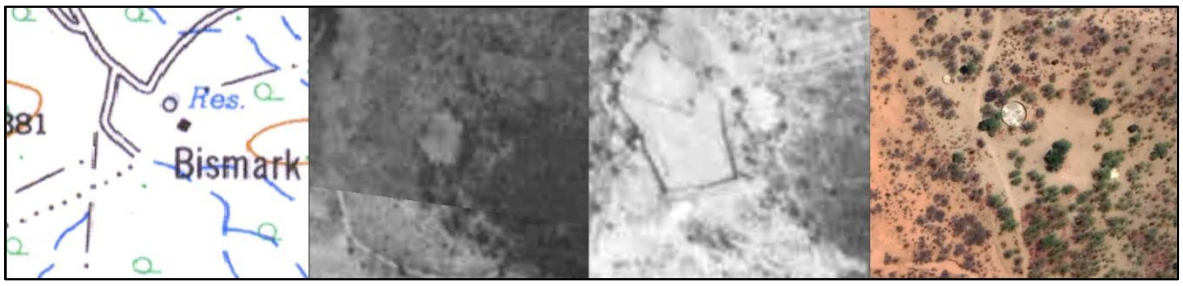


Figure 5-94: The Bismarck farmstead indicated on a topographic map dating to 1968 (left) and indicated on an historical aerial image dating to 1938 and 1952 (center). The remains of the site appear on the 2018 aerial image to the right.

Figure 5-95: View of the poorly preserved building foundation at Site Exigo-BIS-HP01.

Figure 5-96: A dam foundation at Site Exigo-BIS-HP01.

Figure 5-97: A glass fragment from a midden at Site Exigo-BIS-HP01.

5.2.5 Burial Sites

- **Exigo-BIS-B1 Burial Site**
  Farm Bismarck: S22.24261° E29.56414°
  Field Rating: 4b. High significance

A burial site holding a single grave was noted along the southern border of Bismack in the proposed Bismarck Dam footprint area. The grave is dressed with a flat marble tombstone bearing the following inscription:

Van Noordwyk
Johannes Gerhardus
Geb. 1931-02-01
Oorl. 1995-06-05
In liefdevolle herinnering aan ons Vader wat vir ons deur die krag van Jesus Christus vir 64 jaar gespaar was.

A now-dilapidated canopy was constructed to cover the grave and it is enclosed in a fence. The burial site, which is of high heritage significance, occurs within the project area and the site will require mitigation measures (see Section 6).

Figure 5-98: View of the burial site at Site Exigo-BIS-BP01.

Figure 5-99: View of the tombstone inscription at Site Exigo-BIS-BP01.

- **Exigo-BIS-B2 Burial Site**
  Farm Bismarck: S22.24100° E29.57895°
- **Field Rating: 4b. High significance**

Two possible burial sites were noted in association with an Iron Age settlement area in the proposed Bismarck Dam footprint area. The structures consist of two stone heaps placed in a rough rectangle and an oval. No material culture was noted in association with the structure. Temporal and cultural contexts for the features are not known but the features occur at the Iron Age Settlement (Site Exigo-BIS-C01) and it might be contextually linked to the site. The burial site, which is of high heritage significance, occurs within the project area and the site will require mitigation measures (see Section 6).

Figure 5-100: View of the potential burial sites at Site Exigo-BIS-BP02.

- **Exigo-BIS-B3 Burial Site**
  Farm Koningsmark: S22.24654° E29.57148°
  Field Rating: 4b. High significance
- **Exigo-BIS-B4 Burial Site**
  Farm Koningsmark: S22.24698° E29.57099°
  Field Rating: 4b. High significance
- **Exigo-BIS-B5 Burial Site**
  Farm Koningsmark: S22.24736° E29.57156°
  Field Rating: 4b. High significance

Three rectangular / oval stone cairn structures were noted on the farm Koningsmark in the proposed Bismarck Dam footprint area. The structures consist of quartzite stone cairns situated in close proximity of each other. No material culture was noted in association with the structures. The burial sites, which are of high heritage significance, occur in the project area and the site will require mitigation measures (see Section 6).

Figure 5-101: View of the grave at Site Exigo-BIS-BP03.

Figure 5-102: View of the burial site at Site Exigo-BIS-BP04.

Figure 5-103: View of the burial site at Site Exigo-BIS-BP05.

- **Exigo-BIS-B6 Burial Site**
  Farm Bismarck: S22.21335° E29.54523°
  Field Rating: 4b. High significance

At least 5 graves were noted in association with Iron Age settlement areas along the proposed Bismarck Dam pipeline alignment. The structures consist of irregular stone heaps placed in a rough rectangle and an oval shapes. No material culture was noted in association with the structure. Temporal and cultural contexts for the features are not known but the features occur in close proximity of Iron Age Settlement (Site Exigo-BIS-C06) and it might be contextually linked to the site. The burial site, which is of high heritage significance, occurs within the project area and the site will require mitigation measures (see Section 6).

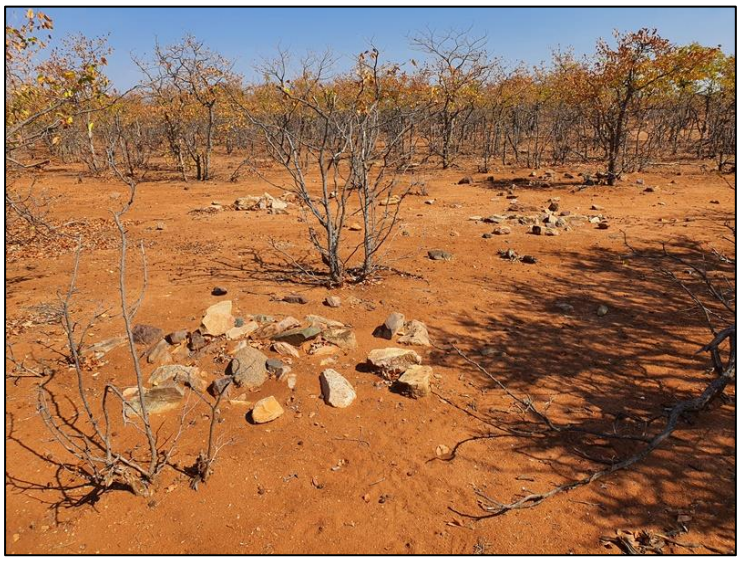


Figure 5-104: View of the burial sites at Site Exigo-BIS-BP06.

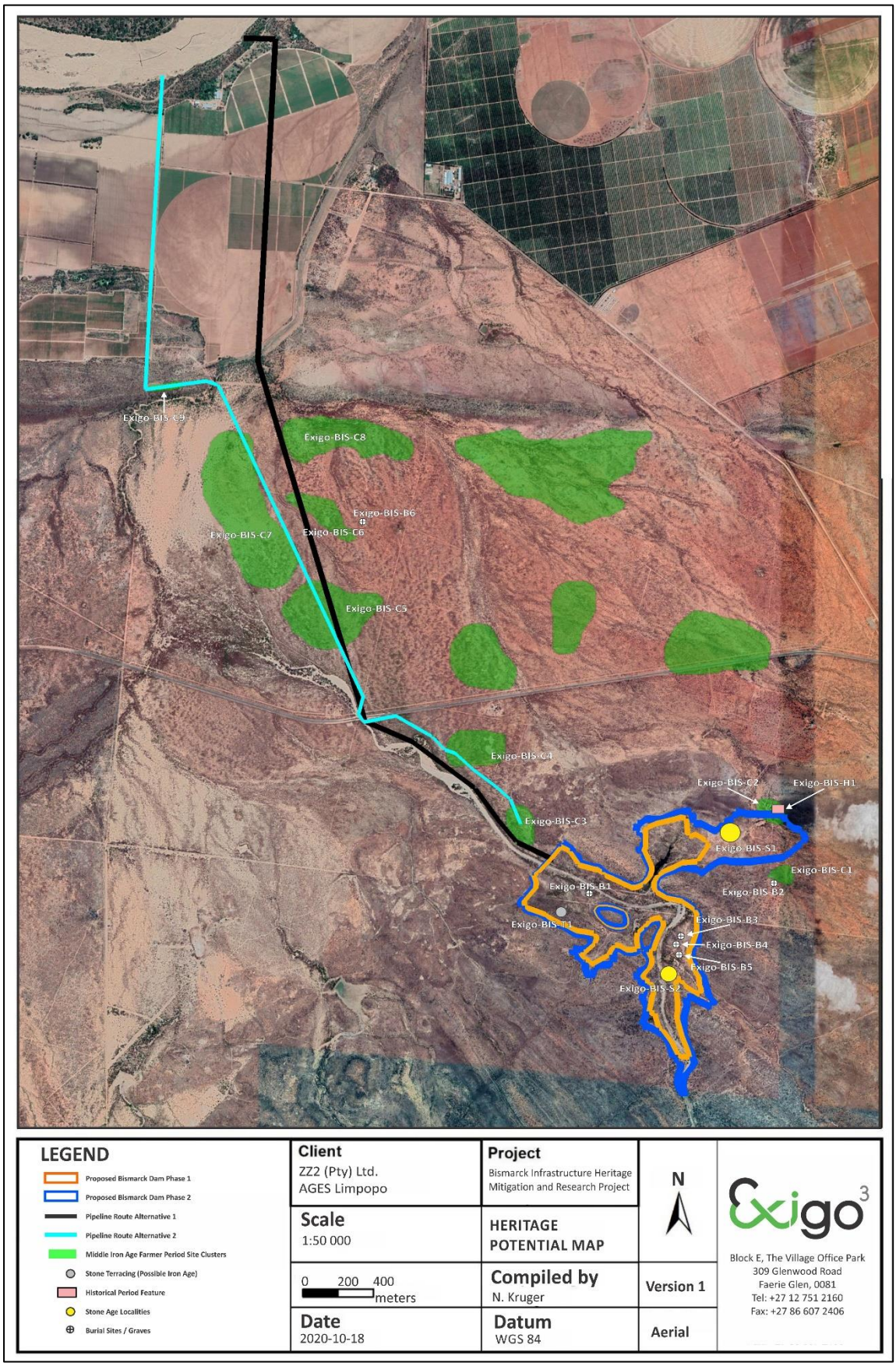


Figure 5-105: Aerial image indicating the location of heritage occurrences and landscape features discussed in the text

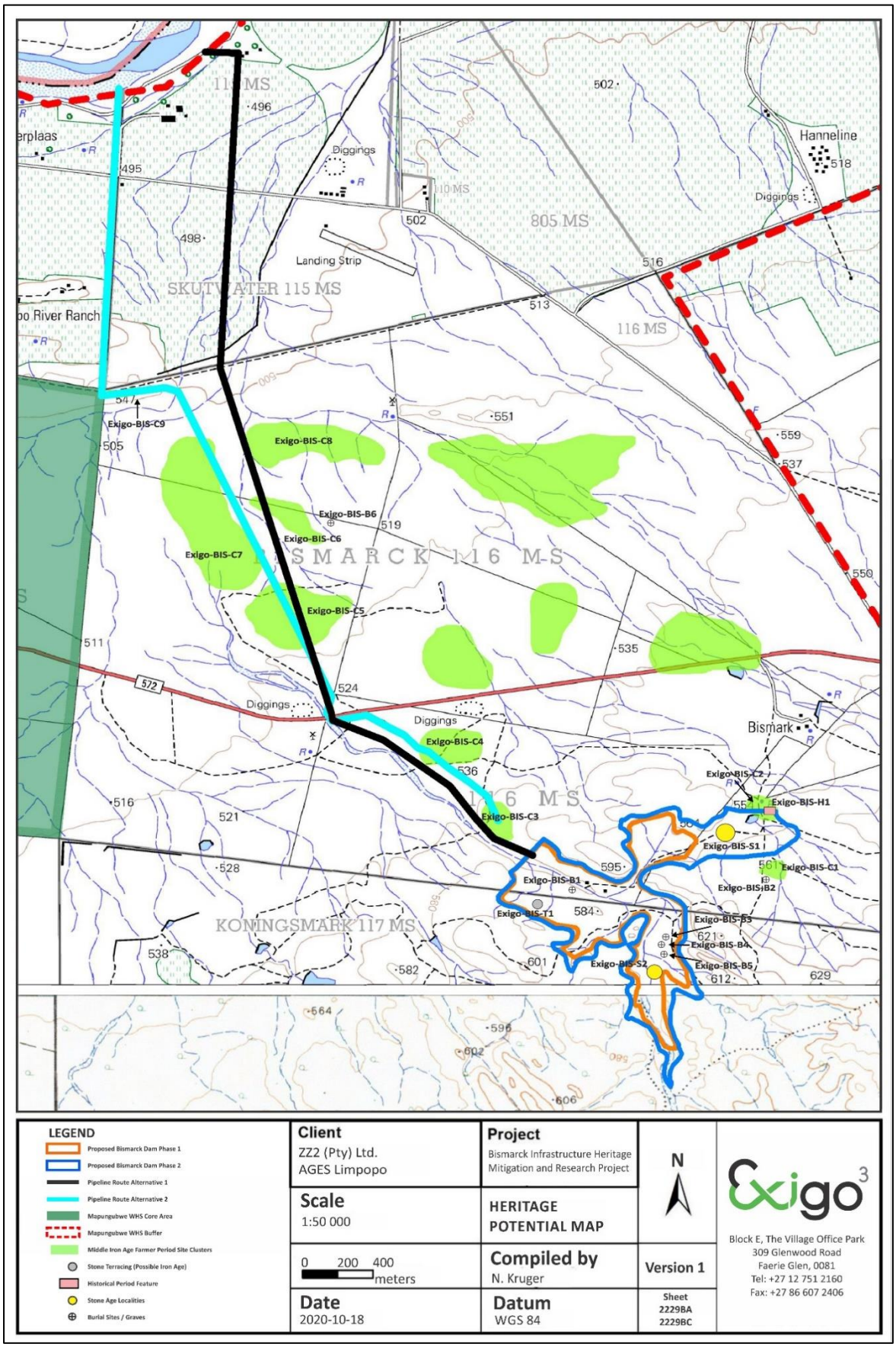


Figure 5-106: Topographic map indicating the location of heritage occurrences and landscape features discussed in the text

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings[2]

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of Addendum 3.

6.1.1 General assessment of impacts on resources

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, of any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

6.1.2 Direct impact rating

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access (refer to Section 10.3 in the Addendum for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected). The significances of the impacts were determined through a synthesis of the criteria below:

Probability: This describes the likelihood of the impact actually occurring.	
Improbable:	The possibility of the impact occurring is very low, due to the circumstances, design or experience.
Probable:	There is a probability that the impact will occur to the extent that provision must be made therefore.
Highly Probable	It is most likely that the impact will occur at some stage of the development.
Definite:	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.
Duration: The lifetime of the impact	
Short term:	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
Medium term:	The impact will last up to the end of the phases, where after it will be negated.
Long term:	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent:	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.
Scale: The physical and spatial size of the impact	

[2] Based on: W inter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

Local:	The impacted area extends only as far as the activity, e.g. footprint
Site:	The impact could affect the whole, or a measurable portion of the above mentioned properties.
Regional:	The impact could affect the area including the neighbouring residential areas.
Magnitude/ Severity: Does the impact destroy the environment, or alter its function.	
Low:	The impact alters the affected environment in such a way that natural processes are not affected.
Medium:	The affected environment is altered, but functions and processes continue in a modified way.
High:	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.	
Negligible:	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
Low:	The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
Moderate:	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High:	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights were assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	**Sum (Duration, Scale, Magnitude) x Probability**	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

The significance of each activity is rated without mitigation measures and with mitigation measures for both construction and operational phases of the development.

The following table summarizes impacts to heritage sites and receptors in the proposed Bismarck Dam & Pipelines EIA Project area:

Nr	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Probability		Duration		Scale		Magnitude/ Severity		Significance		Mitigtion Measures	Mitigation Effect	Residual Impact
				Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Score	Magnitude			
Heritage Impact Assessment																
Planning Phase																
1	EXIGO-BIS-S1, EXIGO-BIS-S2 (Stone Age) impacted by Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible			No
		WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Apply for excavation / destruction permitting.	N/A	No
2	EXIGO-BIS-C1 - EXIGO-BIS-C9 (Middle Iron Age) impacted Bismarck Dam and pipelines	**WOM**	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible			No
		WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Apply for excavation / destruction permitting. Public participation, stakeholder engagement.	N/A	No
3	EXIGO-BIS-T1 (Later Iron Age) impacted by impacted Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Local	1	Medium	6	8	Negligible			No
		WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Apply for excavation / destruction permitting. Public participation, stakeholder engagement.	N/A	No
4	EXIGO-BIS-H1 (Historical Period) impacted by impacted Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible			No
		WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Apply for excavation / destruction permitting. Public participation, stakeholder engagement.	N/A	No

5	EXIGO-BIS-B1 - EXIGO-BIS-B6 (Burials) impacted by impacted Bismarck Dam and pipelines	**WOM**	Negative	Improbable	1	Short term	1	Local	1	High	8	10	Negligible	Plan a heritage conservation buffer of at least 50around the graves Apply for excavation / destruction permitting. Public participation, stakeholder engagement.r.	N/A	No
		WM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible			No
Construction Phase																
6	EXIGO-BIS-S1, EXIGO-BIS-S2 (Stone Age) impacted by Bismarck Dam	**WOM**	Negative	Definite	5	Permanent	5	Regional	3	Medium	6	70	High	Full Phase 2 Specialist Assessment of sites and apply for destruction permits if impacted upon.		Yes
		WM	Positive	Improbable	1	Short term	1	Regional	3	Medium	6	10	Negligible	General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
7	EXIGO-BIS-C1 - EXIGO-BIS-C9 (Middle Iron Age) impacted Bismarck Dam and pipelines	**WOM**	Negative	Definite	5	Permanent	5	Regional	3	Medium	6	70	High	Full Phase 2 Specialist Assessment of sites and apply for destruction permits if impacted upon.		Yes
		WM	Positive	Improbable	1	Medium term	3	Regional	3	Medium	6	12	Negligible	General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
8	EXIGO-BIS-T1 (Later Iron Age) impacted by impacted Bismarck Dam	**WOM**	Negative	Definite	5	Permanent	5	Regional	3	Low	2	50	Moderate	Full Phase 2 Specialist Assessment of sites and apply for destruction permits if impacted upon.		Yes
		WM	Positive	Improbable	1	Medium term	3	Regional	3	Low	2	8	Negligible	General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
9	EXIGO-BIS-H1 (Historical Period) impacted by impacted Bismarck Dam	**WOM**	Negative	Definite	5	Permanent	5	Regional	3	Low	2	50	Moderate			Yes
		WM	Positive	Improbable	1	Short term	1	Regional	3	Low	2	6	Negligible	Apply for destruction permits if impacted upon. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
10	EXIGO-BIS-B1 - EXIGO-BIS-B6 (Burials) impacted by impacted Bismarck Dam and pipelines	**WOM**	Negative	Definite	5	Permanent	5	Regional	3	High	8	80	High	Implement a heritage conservation buffer of at least 100m around the grave. Erect a fence around the burial site and apply access control with signage to indicate visitation contacts. implementation of a site management plan detailing site management conservation	Can be avoided, managed or mitigated	Yes

		WM	Positive	Improbable	1	Medium term	3	Regional	3	Low	2	8	Negligible	measures. Strict and continuous monitoring of the heritage site during construction. Grave relocation subject to permitting if impacted upon. General site monitoring by informed ECO.		No
Operational Phase																
	EXIGO-BIS-S1, EXIGO-BIS-S2 (Stone Age) impacted by Bismarck Dam	**WOM**	Negative	Highly Probable	4	Permanent	5	Site	2	Low	2	36	Low			No
11		**WM**	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible	No mitigation. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
	EXIGO-BIS-C1 - EXIGO-BIS-C9 (Middle Iron Age) impacted Bismarck Dam and pipelines	**WOM**	Negative	Highly Probable	4	Permanent	5	Site	2	Low	2	36	Low			No
12		**WM**	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible	No mitigation. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
	EXIGO-BIS-T1 (Later Iron Age) impacted by impacted Bismarck Dam	**WOM**	Negative	Highly Probable	4	Permanent	5	Site	2	Medium	6	52	Moderate			Yes
13		**WM**	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible	No mitigation. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
	EXIGO-BIS-H1 (Historical Period) impacted by impacted Bismarck Dam	**WOM**	Negative	Highly Probable	4	Permanent	5	Site	2	Low	2	36	Low			No
14		**WM**	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible	No mitigation. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	No
15	EXIGO-BIS-B1 - EXIGO-BIS-B6 (Burials) impacted by impacted Bismarck Dam and pipelines	**WOM**	Negative	Highly Probable	4	Permanent	5	Regional	3	High	8	64	High	No mitigation. General site monitoring by informed ECO.	Can be avoided, managed or mitigated	Yes

		WM	Negative	Probable	2	Long term	4	Site	2	Low	2	16	Negligible			No
Decommissioning and Rehabilitation Phase																
	EXIGO-BIS-S1, EXIGO-BIS-S2 (Stone Age) impacted by Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible			No
16		**WM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	No mitigation. General site monitoring by informed ECO.	N/A	No
	EXIGO-BIS-C1 - EXIGO-BIS-C9 (Middle Iron Age) impacted Bismarck Dam and pipelines	**WOM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible			No
17		**WM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	No mitigation. General site monitoring by informed ECO.	N/A	No
	EXIGO-BIS-T1 (Later Iron Age) impacted by impacted Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Site	2	Medium	6	9	Negligible			No
18		**WM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	No mitigation. General site monitoring by informed ECO.	N/A	No
	EXIGO-BIS-H1 (Historical Period) impacted by impacted Bismarck Dam	**WOM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible			No
19		**WM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	No mitigation. General site monitoring by informed ECO.	N/A	No
	EXIGO-BIS-B1 - EXIGO-BIS-B6 (Burials) impacted by impacted Bismarck Dam and pipelines	**WOM**	Negative	Improbable	1	Short term	1	Site	2	High	8	11	Negligible			No
20		**WM**	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	No mitigation. General site monitoring by informed ECO.	N/A	No

6.2 Evaluation of Significance and Impact

In terms of heritage resources, the MCL is pointedly well-known for its Iron Age Farmer archaeology related to State Formation in Iron Age Farmer communities of southern Africa. The Bismarck project landscape is no exception where a number of significant Middle Iron Age sites, including the Skutwater site, are a testimony to the earliest known state society in Southern Africa (AD 900-1300).

6.2.1 Archaeology

This assessment identified Middle and Later Stone Age localities, wide-spread Iron Age Farmer, Historical Period remnants as well as possible archaeological burial sites in the proposed project area. MSA and LSA scatters contain formal tools and these sites are of medium significance. Wide-spread Iron Age Farmer settlement remains representative of the Transitional K2 (TK2), K2 and Khami periods occur in the project area and the universal significance of these sites within the context of the Mapungubwe World Heritage landscape cannot be underestimated. As a result, impacts to these sites will have important implications in terms of the MCL and the WHS, cognizant of the following:

- The Bismarck sites have definite political, economic, and ritual links to Mapungubwe and the location of the sites presents an opportunity to investigate the reach and influence of the Mapungubwe rulers over the wider middle Limpopo Valley. For example, research further south and east suggests that Mapungubwe likely did not exercise direct forms of overt rule, but instead relied on economic interdependence and cooperation with its larger hinterland. In the confluence area, trade, craft production and some ritual rites are monopolised by the Mapungubwe elite, but this decreases as one moves outside this heartland. Because the Bismarck sites straddles the hinterland and core, they present an ideal test of political and economic organisation of the Mapungubwe world.
- There are quite clear indications that the sites offer a unique opportunity to understand the way ceramics were used and traded locally as well as regionally. While the ceramics are stylistically classified as TK2, micro distribution patters are evident from the surface finds. For example, it seems that the cattle post sites display a very distinctive calcite temper, largely absent from the agricultural sites. Understanding how ceramic style at once unites a regional cultural phenomenon, but also articulates distinct local identities, is important. In addition, establishing regional links through geochemical fingerprinting with TK2 period sites in and around Mapungubwe, and sites to the west, remains a priority for understanding this period. The geographical position of the Bismarck sites marks them as crucial to inform on these regional links.
- While it is widely acknowledged that state formation at Mapungubwe is linked to agricultural intensification, the land-use system itself remains poorly understood. The pristine nature of the sites and alluvial fans on Bismarck presents a unique opportunity to conduct a geoarchaeological study on land use and landscape change. This could be complemented by archaeobotanical studies such as pollen and phytoliths, to understand crop regimes and paleoclimate of the period.
- Many of the key research questions leading to the build-up of socio-political complexity at Mapungubwe is also at play at Bismarck. Therefore, it seems that the Bismarck sites can act as an independent test for many of the observations evident in the confluence area (climate change and human response, agricultural systems etc.), and also expand our understanding of these processes that lead to state formation at Mapungubwe and how areas outside the confluence core play into it.

The Bismarck Middle Iron Age settlements undoubtedly integrate in hugely important ways with the MCL at regional level and the heritage landscape as a whole risks significant impact from the project. The potential impact on the Bismarck Middle Iron Age settlements is regarded as HIGH but this impact rating can be limited

to a LOW impact by the implementation of mitigation measures (avoidance, robust research-based mitigation, site management, site monitoring) for the sites, if / when required

6.2.2 Built Environment

The study noted the remains of the poorly preserved Bismarck farmstead but no notable heritage or historical association to the structure could not be established and the site is of low heritage significance. As such, no impact on the built environment features of significance is anticipated. As for the rest of the project area, the general landscape holds varied significance in terms of the built environment as the area comprises historical farming remnants within the MCL and the MCLWHS buffer area.

6.2.3 Cultural Landscape and the OUVs of the MCL

The Bismarck sites occupy a key spatial position in the geopolitical world of the Middle Iron Age Limpopo Valley, since they straddle the zone of interaction between the wider hinterland and the Mapungubwe heartland. As a consequence, the project lies within the Buffer Zone of the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) and developments within the MCLWHS buffer may have implications for the World Heritage Site status and/or its Outstanding Universal Values (OUVs) which are:

- The Mapungubwe Cultural Landscape contains evidence for an important interchange of human values that led to far-reaching cultural and social changes in Southern Africa between AD 900 and 1300.
- The remains in the Mapungubwe Cultural Landscape are a remarkably complete testimony to the growth and subsequent decline of the Mapungubwe State which at its height was the largest kingdom in the African subcontinent.
- The establishment of Mapungubwe as a powerful state trading through the East African ports with Arabia and India was a significant stage in the history of the African sub-continent.
- The remains in the Mapungubwe cultural landscape graphically illustrate the impact of climate change and record the growth and then decline of the Kingdom of Mapungubwe as a clear record of a culture that became vulnerable to irreversible change.

Many of the processes seen in the Shashi-Limpopo confluence around Mapungubwe which forms the basis of the OUVs of the WGS are evident within the Bismarck site context. Extended to a regional scale, the Bismarck sites therefore likely fulfil a similar role in the larger socio-political process of state formation at Mapungubwe and how areas outside the confluence core play into it. As such, Bismarck is representative of populated landscape consisting out different segments of the same community with certain political, economic, and ritual links to Mapungubwe. As a consequence, impact to the Bismarck Iron Age horizon will impact the OUVs of the MCL and the WHS. The Bismarck Middle Iron Age settlements undoubtedly integrate in hugely important ways with the MCL at regional level and any impact and resulting mitigation must take cognisance of the fact that the sites are part of an integrated landscape-wide settlement system, where impact on one part of the system affects the whole. As such, the potential impact on the MCL UOVs is regarded as HIGH but this impact rating can be limited to a LOW impact by the implementation of mitigation measures (stakeholder engagement, robust research-based mitigation, site management, site monitoring) for the sites, if / when required.

6.2.4 Graves / Human Burials Sites

At least 6 human burial sites were located within the project area. The receptors range in age from probable archaeological graves to more recent burials. The features are of high significance in terms of heritage, social and cultural value. The potential impact on the resources is regarded as HIGH but this impact rating can be

limited to a NEGLIBLE impact by the implementation of mitigation measures (avoidance, site management, site monitoring / grave relocation) for the sites, if / when required. In the rural areas of the Limpopo Province, graves and cemeteries often occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met

6.3 Management actions

Recommendations for relevant heritage resource management actions are vital to the conservation of heritage resources. A general guideline for recommended management actions is included in Section 10.4 of Addendum 3.

OBJECTIVE: ensure conservation of heritage resources of significance, prevent unnecessary disturbance and/or destruction of previously undetected heritage receptors.

*For the Stone Age localities of medium heritage significance (**EXIGO-BIS-S1, EXIGO-BIS-S2**) within the project area the following are required in terms of heritage management and mitigation:*

PROJECT COMPONENT/S	Pre-construction, all phases of construction and operation.		
POTENTIAL IMPACT	Damage/destruction of sites, loss of OUVs of the MCL.		
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface. Flooding of sites by rising dam water.		
MITIGATION: TARGET/OBJECTIVE	To conserve the historical fabric of the sites and to locate undetected heritage remains as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL		**RESPONSIBILITY**	**TIMEFRAME**
Primary Mitigation Procedure			
Site Mitigation: Mitigation of each of the sites prior to destruction, including: - A detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the archaeology of the region to be conducted. - A mitigation methodology to be developed based on an understanding of the archaeology and history of the broader region. - The process should include the recording surface and subsurface sampling of Stone Age localities in the project area. - This phase should include the analysis and processing of all excavated artefacts and the curation of material according to conventional professional archaeological collections management principles which include the accessioning, packing and inventorying of		STONE AGE SPECIALIST	Site mitigation should be concluded prior to development site impacts.

material. - This measure should culminate in the publication of research findings. This measure should be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage authorities.		
Secondary Mitigation Procedure		
Site Monitoring: Regular examination of trenches and excavations.	HERITAGE ASSESSMENT PRACTITIONER	Prior to the commencement of construction and earth-moving.

PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.
MONITORING	Successful location of sites by person/s monitoring.

*For the Historical Period remnants of low significance **(Exigo-BIS-H1)** within the project area the following are required in terms of heritage management and mitigation:*

PROJECT COMPONENT/S	Pre-construction, all phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.	
MITIGATION: TARGET/OBJECTIVE	To locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Primary Mitigation Procedure		
Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors. **Permitting:** Obtain necessary destruction permits from the relevant Heritage Resources Authorities prior to site impact and destruction.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible. Prior to the commencement of construction and earth-moving.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

*For the Iron Age terracing of medium significance **(Exigo-BIS-T1)** within the project area the following are required in terms of heritage management and mitigation:*

PROJECT COMPONENT/S	Pre-construction, all phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites, loss of OUVs of the MCL.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface. Flooding of sites by rising dam water	
MITIGATION: TARGET/OBJECTIVE	To locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Primary Mitigation Procedure		
Site Mitigation: Documentation of sites if features are to be impacted on by development (mapping, desktop study Phase 2 site sampling). Permitting if and when required. **Permitting:** Obtain necessary destruction permits from the relevant Heritage Resources Authorities prior to site impact and destruction.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible. Prior to the commencement of construction and earth-moving.
Secondary Mitigation Procedure		

Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors.		
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

*For the Iron Age site clusters of medium heritage significance **(Exigo-BIS-C1 - Exigo-BIS-C9)** within the project area the following are required in terms of heritage management and mitigation:*

- **Site EXIGO-MCRU-IA01**

PROJECT COMPONENT/S	Pre-construction, all phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites, loss of OUVs of the MCL.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface. Flooding of sites by rising dam water	
MITIGATION: TARGET/OBJECTIVE	To conserve the historical fabric of the sites and to locate undetected heritage remains as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Primary Mitigation Procedure		
Site Mitigation: Mitigation of each of the clusters prior to destruction by means of a comprehensive research-driven heritage mitigation plan which need to inform a robust research framework in order to: (1) determine the extent of the Iron Age archaeological horizon on Bismarck and in the project area, (2) investigate the nature, stratigraphy, extent and cultural context of the Iron Age Farmer landscape, (3) provide an interpretation of the Bismarck Iron Age horizon within the context of the MCL landscape. (4) preserve the historical fabric of the Bismarck Iron Age horizon in terms of the MCLWGS OUVs and in particular, development areas for the purposes of future research in the Mapungubwe World Heritage landscape. This measure should include: - A detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the MCL. - A research driven mitigation methodology based on current research themes within the MCL. - The recording of all clusters by means of systematic surveys and site mapping. - Extensive surface and subsurface sampling of selected zones within Clusters in order to generate material for analysis and preservation. - The analysis of all excavated material by means of Ceramic, Fauna, Geoarchaeology, Archaeobotany, Isotope and Bioarchaeology analysis as well as Radiocarbon Dating of samples representative of all Clusters. - The processing and curation of material according to conventional professional archaeological collections management principles which include the accessioning, packing and inventorying of material. It is essential that this measure should culminate in the publication of research findings. This measure will be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage	HERITAGE ASSESSMENT PRACTITIONER TERTIARY RESEARCH INSTITUTION SUBJECT SPECIALISTS SOCIAL SCIENTIST CURATING BODIES	Prior to the commencement of construction and earth-moving.

authorities. **This mitigation measure should include a comprehensive Public Participation and Social Engagement process, preferably conducted by a Social Specialist whereby all relevant stakeholders are adequately consulted.**		
Secondary Mitigation Procedure		
Site Monitoring: Regular examination of trenches and excavations.	ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

*For the highly significant single burial sites (**Site Exigo-BIS-B1 - Site Exigo-BIS-B6**) occurring within the proposed Bismarck Dam & Pipelines EIA Project the following are required in terms of heritage management and mitigation:*

PROJECT COMPONENT/S	All phases of construction and operation.	
POTENTIAL IMPACT	Damage/destruction of sites, loss of OUVs of the MCL.	
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface. Flooding of sites by rising dam water	
MITIGATION: TARGET/OBJECTIVE	To locate human burials as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.	
MITIGATION: ACTION/CONTROL	**RESPONSIBILITY**	**TIMEFRAME**
Primary Mitigation Procedure		
Avoidance: Implement a heritage conservation buffer of at least 0m around the burial sites, redesign project infostructure to avoid the heritage resource and the proposed conservation buffer. Erect fences around the burial sites and apply access control with signage to indicate visitation contacts. Weekly monitoring during initial site clearing and earth moving activities by an ECO familiar with the sensitivity of receptors, or the Heritage Consultant. Monthly monitoring of the burial sites is recommended during subsequent stages of development. Implementation of a site management plan detailing site management conservation measures. **Grave relocation:** relocation of the burial to the nearby cemetery, documentation of site, full social consultation with affected parties, possible conservation management and protection measures. subject to authorisations and relevant permitting from heritage authorities and affected parties.	DEVELOPER QUALIFIED HERITAGE SPECIALIST	Site mitigation should be concluded prior to development site impacts.
Secondary Mitigation Procedure		
Site Monitoring: Regular examination of trenches and excavations in this area in order to avoid the destruction of previously undetected burials or heritage remains.	ECO	Monitor as frequently as practically possible.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.	
MONITORING	Successful location of sites by person/s monitoring.	

7 RECOMMENDATIONS

In terms of heritage resources, the MCL is universally significant for its Iron Age Farmer archaeology relating to State Formation in Iron Age Farmer communities of southern Africa. The Bismarck project landscape is no exception where a number of significant Middle Iron Age sites, including the Skutwater site, are a testimony to the earliest known state society in Southern Africa (AD 900-1300). The Bismarck sites occupy a key spatial position in the geopolitical world of the Middle Iron Age Limpopo Valley, since they straddle the zone of interaction between the wider hinterland and the Mapungubwe heartland. As a consequence, the project lies within the Buffer Zone of the Mapungubwe Cultural Landscape World Heritage Site (MCLWHS) and developments within the MCLWHS buffer may have implications for the World Heritage Site status and the Outstanding Universal Values (OUVs) of the MCLWHS. Cognisant thereof, the following recommendations are made based on general observations in the proposed Bismarck Dam & Pipelines EIA Project area:

- Stone Age remains occur abundantly in the Limpopo landscape and the field assessment located 2 predominantly Middle Stone Age (MSA) localities (**EXIGO-BIS-S1, EXIGO-BIS-S2**) in project area. These localities are of medium significance and the sites should be mitigated prior to impact, including a detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the archaeology of the region. A mitigation methodology should be developed based on an understanding of the archaeology and history of the broader region and this should be followed by the recording and surface and subsurface sampling of the Stone Age localities by a qualified Stone Age Specialist. Artefact samples should be analysed and it is essential that this measure culminate in the publication of research findings. Mitigation of these localities should be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage authorities. Generally, the sites should be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains.
- The remains of the Bismarck farmstead dating to the Historical Period (**Exigo-BIS-H1**) are poorly preserved and the site holds limited heritage potential. The occurrence is rated as low significate but its position within the sensitive medium significance Iron Age site (Exigo-BIS-C2) should be noted and observed. The farmstead remains occur within the project area and it is recommended that the necessary destruction permits be obtained from the relevant Heritage Resources Authorities prior to site impact and destructions they are older than 60 years and generally protected under heritage legislation.
- A number of small stone terraces (**Exigo-BIS-T1)** occur in the proposed Bismarck dam footprint area. The poorly preserved stone structures probably indicate a Later Iron Age Farmer Period occupation and the site might be significant in terms of its regional and local representation in the Iron Age Farmer Period landscape of the area. It is rated as low significance and the documentation of the features (mapping, desktop study, possible Phase 2 site sampling) is recommended. The necessary destruction permits should be obtained from the relevant Heritage Resources Authorities prior to site impact and destruction.
- Wide-spread Iron Age Farmer settlement remains representative of the Transitional K2 (TK2), K2 and Khami periods (**Exigo-BIS-C1 - Exigo-BIS-C9)** occur in clusters the project area and the universal significance of these clusters within the context of the MCL and the MCLWHS landscape is apparent. The mitigation of each of the clusters prior to destruction is essential where a comprehensive research-driven heritage mitigation plan is required to need to inform a robust research framework. The framework should (1) determine the extent of the Iron Age archaeological horizon on Bismarck and in the project area, (2) investigate the nature, stratigraphy, extent and cultural context of the Iron Age Farmer landscape, (3) provide an interpretation of the Bismarck Iron Age horizon within the context of the MCL landscape and it's OUVs, and (4) aim to preserve the historical fabric of the

Bismarck Iron Age horizon in terms of the MCLWHS OUVs and in particular, development areas for the purposes of future research in the MCL landscape. Mitigation of the clusters should include a detailed desktop assessment, reappraisal of previous publications and a literature study of sources on the MCL whereby a robust research driven mitigation methodology based on current research themes within the MCL is formulated. All clusters should be documented by means of systematic surveys and site mapping and extensive surface and subsurface sampling of selected zones within clusters should be conducted in order to generate material for analysis and preservation. The analysis of all excavated material by means of Ceramic, Fauna, Geoarchaeology, Archaeobotany, sotope and Bioarchaeology analysis as well as Radiocarbon Dating of samples representative of all Clusters, will be required. It is essential that recovered material is processed and curated according to conventional professional archaeological collections management principles which include the accessioning, packing and inventorying of material. This heritage mitigation plan should culminate in the publication of research findings. This mitigation plan should be undertaken subject to relevant and required excavation/ destruction permitting from the relevant heritage authorities and the process should include a comprehensive Public Participation and Social Engagement process, preferably conducted by a Social Specialist whereby all relevant stakeholders are adequately consulted. Generally, the sites and the general landscape should be monitored by an informed ECO in order to avoid the destruction of previously undetected heritage remains. It should be stressed that any future mitigation must take cognisance of the fact that the Bismarck Iron Age clusters are part of an integrated landscape-wide settlement system, where impact on one part of the system affects the whole.

- Six burial sites occurring within the Bismarck Dam & Pipelines EIA Project (**Exigo-BIS-BP1 - Site Exigo-BIS-B6**) are of high significance and the sites will be impacted on by site development. It is primarily recommended that the burial sites be conserved *in situ* and that conservation buffers of at least 50m be implemented around the heritage receptors. Each of the sites should be fenced and access gates should provide controlled access to the sites. A distance of at least 2m should be maintained between the graves and fences which should be at least 1,8m high. Clear signboards should be erected indicating the heritage sensitivity of the sites and contact details for visitation of the graves should be provided. The sites should be monitored on a weekly basis during initial site clearing and earth moving activities by an ECO familiar with the sensitivity of receptors, or the Heritage Consultant in order to detect any impact at the earliest opportunity. Further monthly monitoring of the burial sites is recommended during subsequent stages of development. A Site Management Plan (SMP) should be implemented detailing these conservation measures and indicating responsible parties in this regard. The developer should carefully liaise with the heritage specialist and the SAHRA Burial Ground and Graves (BGG) Unit with regards to these recommended management measures. Should impact on the resources prove inevitable, the graves should be relocated by a qualified archaeologist, and in accordance with relevant legislation, permitting, statutory permissions and subject to any local and regional provisions and laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials (see Addendum 1). Generally, it is recommended that the EIA public participation and social consultative process address the possibility of further graves occurring in the project area.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

- It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the project landscape at archeological sites, along water sources and drainage lines, fountains and pans would often have attracted human activity in the past. Also, since Stone Age material seems to originate from below present soil surfaces in eroded areas, the larger landscape should be regarded as potentially sensitive in terms of possible subsurface deposits. Burials and historically significant structures dating to the Colonial Period occur on farms in the area and these resources should be avoided during all phases of construction and development, including the operational phases of the development.

In addition to these site-specific recommendations, careful cognizance should be taken of the following:

- As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.
- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material occur in the larger landscape, such resources should be regarded as potentially sensitive in terms of possible subsurface deposits.

8 GENERAL COMMENTS AND CONDITIONS

This AIA report serves to confirm the extent and significance of the heritage landscape of the proposed Bismarck Dam & Pipelines EIA Project area. The larger heritage horizon encompasses rich and diverse archaeological landscapes and cognisance should be taken of heritage resources and archaeological material that might be present in surface and sub-surface deposits. If, during construction, any possible archaeological material culture discoveries are made, the operations must be stopped and a qualified archaeologist be contacted for an assessment of the find. Such material culture might include:

- Formal Earlier Stone Age stone tools.
- Formal MSA stone tools.
- Formal LSA stone tools.
- Potsherds
- Iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- Faunal remains.
- Human remains/graves.
- Stone walling or any sub-surface structures.
- Historical glass, tin or ceramics.
- Fossils.

If such sites were to be encountered or impacted by any proposed developments, recommendations contained in this report, as well as endorsement of mitigation measures as set out by AMAFA, SAHRA, the National Resources Act and the CRM section of ASAPA will be required. It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, represent the area's complete archaeological legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)). It must also be clear that Archaeological Specialist Reports will be assessed by the relevant heritage resources authority (SAHRA).

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10 ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND

10.1 CRM: Legislation, Conservation and Heritage Management

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

10.1.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

d. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as the "60-years clause". Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(d) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(e) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(f) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(g) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(h) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(i) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority;

(j) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

e. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

10.1.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

***"38.** (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a*

development categorised as:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site:

(i) exceeding 5 000 m^2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."

And:

"The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(k) The identification and mapping of all heritage resources in the area affected;

(l) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(m) an assessment of the impact of the development on such heritage resources;

(n) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(o) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(p) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(q) plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64)."

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Archaeological Impact Assessments (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60

years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects. Heritage resources management and conservation.

10.2 Assessing the Significance of Heritage Resources

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable.* Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

- Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA (MP-PHRA).
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 60 years.
- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally
ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
2.2 Field Register Rating			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			
Specific community			

10.3 Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

Significance of the heritage resource

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective, it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. site-specific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Intensity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major

influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts
of very high significance should be a central factor in decision-making.

10.4 Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

	TYPE OF DEVELOPMENT			
HERITAGE CONTEXT	**CATEGORY A**	**CATEGORY B**	**CATEGORY C**	**CATEGORY D**
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected

NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.

HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT
Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources **Context 2:** Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources. **Context 3:** Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources **Context 4:** Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.	**Category A: Minimal intensity development** - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. **Category B: Low-key intensity development** - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2 - Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). **Category C: Moderate intensity development** - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) **Category D: High intensity development** - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)

10.5 Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

No further action / Monitoring

Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.

Avoidance

This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.

Mitigation

This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.

Compensation

Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.

Rehabilitation

Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource.

Enhancement