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SA FLUORITE (PTY) LTD & SOUTHERN PALACE 398 (PTY) LTD: PROPOSED DOORNHOEK FLUORSPAR MINE PROJECT, NGAKA MODIRI MOLEMA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

Archaeological Impact Assessment

A 3D rendering of a globe with water splashing over it, set against a white background with a reflection below.

Innovation in Sustainability

The logo for EOH, consisting of the letters 'EOH' in a bold, white, sans-serif font with a small triangle above the 'O'.

Prepared for: SA Fluorite (Pty) Ltd & Southern Palace 398 (Pty) Ltd

Prepared by: Exigo Sustainability

ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF DEMARCTED AREAS ON THE FARMS RHENOSTERFONTEIN 304JP AND FARM 306JP FOR THE PROPOSED DOORNHOEK FLUORSPAR MINE PROJECT, NGAKA MODIRI MOLEMA DISTRICT MUNICIPALITY, NORTH WEST PROVINCE

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Exigo Sustainability promotes the conservation of sensitive archaeological and heritage resources and therefore uncompromisingly adheres to 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). In order to ensure best practices and ethics in the examination, conservation and mitigation of archaeological and heritage resources, Exigo Sustainability follows the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment as set out by the South African Heritage Resources Agency (SAHRA) and the CRM section of the Association for South African Professional Archaeologists (ASAPA).

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 Doornhoek Fluorspar Mine 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: 16 June 2016

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study on the farms Rhenosterfontein 304JP and Farm 306JP, subject to an Environmental Impact Assessment (EIA) process for the proposed Doornhoek Fluorspar Mine Project near Zeerust, Ngaka Modiri Molema District Municipality, North West Province. The project entails the mining of fluorspar over an area of approximately **280ha**, as well as related infrastructure (waste rock dumps, minerals processing plant, tailings facility, haul roads and offices, water supply pipelines, electrical reticulation and sub-stations) over areas in excess of **200ha**. 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.

A large number of archaeological and historical studies have been conducted in the North West Province and many of these studies infer a varied and rich heritage landscape. These studies infer an immensely rich and diverse cultural landscape, primary of which is the Kaditshwene Cultural Landscape and National Heritage Site, 50km north of the project area. The Kaditshwene Cultural Landscape does not only constitute the site of Kaditshwene but rather a vast distribution of sites in the North West Province. In addition to this nationally important cultural landscape the Doornhoek Fluorspar Project is situated in a rich and sensitive heritage area. As such, material from the earlier, middle and later Stone Age occur widely across the North West Province and such sites are likely to occur along drainage lines and at sources of water on the Project properties. Moving into recent history, farms appeared around the town of Zeerust in the 19th century and related infrastructure emerged. Most of the farms in the Project Area were proclaimed in the 19th century and beginning of the 20th century and a number of historical structures occur around Doornhoek. The most prominent colonial remnants in the Mafikeng area can be attributed to the South African War or the Anglo-Boer War (1899-1902). The various battles and skirmishes resulting from this influential conflict left a legacy of heritage sites scattered across the South African interior, especially the historical Boer Republics north of the Vaal River where fortifications, war cemeteries and battlefields still remain.

Similarly, a number of heritage occurrences and features were noted in the Doornhoek Fluorspar Mine Project area.

- Traces of more recent artisanal fluorspar mining (**Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04**) occurring within the proposed Doornhoek Fluorspar Mine Project areas is of low heritage significance. No further action is required in terms of mitigation of the sites and occurrences.
- Two small Iron Age settlement and Iron Smelting sites (**Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03**) are of significance in terms of its regional representation in the Iron Age farmer period landscape of the Kaditshwene Cultural Landscape. The sites are located in close proximity of Doornhoek Fluorspar Mine Project areas and it is recommended that a careful watching brief monitoring process be implemented whereby an informed ECO inspect the construction sites on regular basis in order to monitor possible impact on existing and previously undetected heritage resources. A heritage conservation buffer of at least 100m around the heritage receptor should be implemented and maintained. Should the sites be impacted on by development in any way it should be adequately documented and sampled by means of a Phase 2 Specialist study and the necessary permits should be obtained from the relevant Heritage Resources Authorities.
- A large Iron Age occupation at **Site EXIGO-DFM-IA01** is of high significance in terms of its regional

representation in the Iron Age farmer period landscape of the area. The site is located within Doornhoek Fluorspar Mine Project areas and it is primarily recommended that proposed development be planned as to avoid impact on the heritage resource, and a heritage conservation buffer of at least 100m around the heritage receptor be implemented. If this measure proves unachievable it is recommended that the historical fabric of the sites be conserved by means of a Phase 2 Specialist study (mapping, site sampling and possible conservation management and protection) and the necessary permits should be obtained from the relevant Heritage Resources Authorities.

- 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 is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area 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 development.

A Palaeontological Impact Assessment should be considered where bedrock is to be impacted on and, should fossil remains such as fossil fish, reptiles or vitrified wood be exposed during construction, these objects should be carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.

Heritage resources of significance occur within and in close proximity of areas proposed for the Doornhoek Fluorspar Mine Project. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed Doornhoek Fluorspar Mine Project on Rhenosterfontein 304JP and Farm 306JP may proceed from a culture resources management perspective, provided that mitigation measures are implemented if and when required.

It is essential that cognisance be taken of the larger archaeological landscape of the North West Province and the Zeerust region in order to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage resources be exposed or uncovered during construction phases of the proposed project, these should immediately be reported to SAHRA. Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process

should occur in conjunction with the mitigation of cemeteries and burials.

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.

Archaeology:

The study of the human past through its material remains.

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.

¹⁴C or radiocarbon dating:

The ¹⁴C method determines the absolute age of organic material by studying the radioactivity of carbon. It is reliable for objects not older than 70 000 years by means of isotopic enrichment. The method becomes increasingly inaccurate for samples younger than ±250 years.

Ceramic Facies:

In terms of the cultural representation of ceramics, a facies is denoted by a specific branch of a larger ceramic tradition. A number of ceramic facies thus constitute a ceramic tradition.

Ceramic Tradition:

In terms of the cultural representation of ceramics, a series of ceramic units constitutes as ceramic tradition.

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.

Culture:

A contested term, "culture" could minimally be defined as the learned and shared things that people have, do and think.

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.

Ecofact:

Non artefactual material remains that has cultural relevance which provides information about past human activities. Examples would include remains or evidence of domesticated animals or plant species.

Excavation:

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and the other material covering and accompanying it.

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

GIS:

Geographic Information Systems are computer software that allows layering of various types of data to produce complex maps; useful for predicting site location and for representing the analysis of collected data within sites and across regions.

Historical archaeology:

Primarily that aspect of archaeology which is complementary to history based on the study of written sources. In the South African context it concerns the recovery and interpretation of relics left in the ground in the course of Europe's discovery of South Africa, as well as the movements of the indigenous groups during, and after the "Great Scattering" of Bantu-speaking groups – known as the *mfecane* or *difaqane*.

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.

Iron Age:

Also known as "Farmer Period", the "Iron Age" is an archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture.

Lithic:

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

Management / Management Actions:

Actions – including planning and design changes - that enhance benefits associated with a proposed development, or that avoid, mitigate, restore, rehabilitate or compensate for the negative impacts.

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.

Megalith:

A large stone, often found in association with others and forming an alignment or monument, such as large stone statues.

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.

Oral Histories:

The historical narratives, stories and traditions passed from generation to generation by word of mouth.

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.

Prehistoric archaeology:

That aspect of archaeology which concerns itself with the development of humans and their culture before the invention of writing. In South Africa, prehistoric archaeology comprises the study of the Early Stone Age, the Middle Stone Age and the greater part of the Later Stone Age and the Iron Age.

Probabilistic Sampling:

A sampling strategy that is not biased by any person's judgment or opinion. Also known as statistical sampling, it includes systematic, random and stratified sampling strategies.

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.

Relative dating:

The process whereby the relative antiquity of sites and objects are determined by putting them in sequential order but not assigning specific dates.

Remote Sensing:

The small or large-scale acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s) that is not in physical or intimate contact with the object (such as by way of aircraft, spacecraft or satellite). Here, ground-based geophysical methods such as Ground Penetrating Radar and Magnetometry are often used for archaeological imaging.

Rock Art Research:

Rock art can be "decoded" in order to inform about cultural attributes of prehistoric societies, such as dress-code, hunting and food gathering, social behaviour, religious practice, gender issues and political issues.

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.

Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

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,

Slag:

The material residue of smelting processes from metalworking.

Stone Age:

An archaeological term used to define a period of stone tool use and manufacture.

Stratigraphy:

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

Stratified Sampling:

A probabilistic sampling strategy whereby a study area is divided into appropriate zones – often based on the probable location of archaeological areas, after which each zone is sampled at random.

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.

Tradition:

Artefact types, assemblages of tools, architectural styles, economic practices or art styles that last longer than a phase and even a horizon are describe by the term *tradition*. A common example of this is the early Iron Age tradition of Southern Africa that originated ± 200 AD and came to an end at about 900 AD.

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.

Tuyère:

A ceramic blow-tube used in the process of iron smelting / reduction.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
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
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
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

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1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability was commissioned by SA Fluorite (Pty) Ltd & Southern Palace 398 (Pty) Ltd for an Archaeological Impact Assessment (AIA) study on the farms Rhenosterfontein 304JP and Farm 306JP, subject to an Environmental Impact Assessment (EIA) process for the proposed Doornhoek Fluorspar Mine Project in the Ngaka Modiri Molema District Municipality, North West 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 Sustainability'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

The Doornhoek Project has the potential to contain in excess of 50 million tonnes of fluorspar and is believed to be one of the world's largest fluorspar deposits. The underground ore body has grades more than double that of the adjoining Sallies Witkop Mine and resources sufficient to justify an initial life of mine in excess of 20 years. The Doornhoek Project is currently in exploration phase and based on a request from the Department of Mineral Resources to quantify the groundwater use and potential exploration impacts on the groundwater resources. The planned infra-structure for the mining operations is as follows:

- Opencast mining to depths of 90m;
- Waste rock dumps;
- Minerals processing plant;
- Tailings facility;
- Haul roads and offices;
- Water supply pipelines;
- Electrical reticulation and sub-stations.

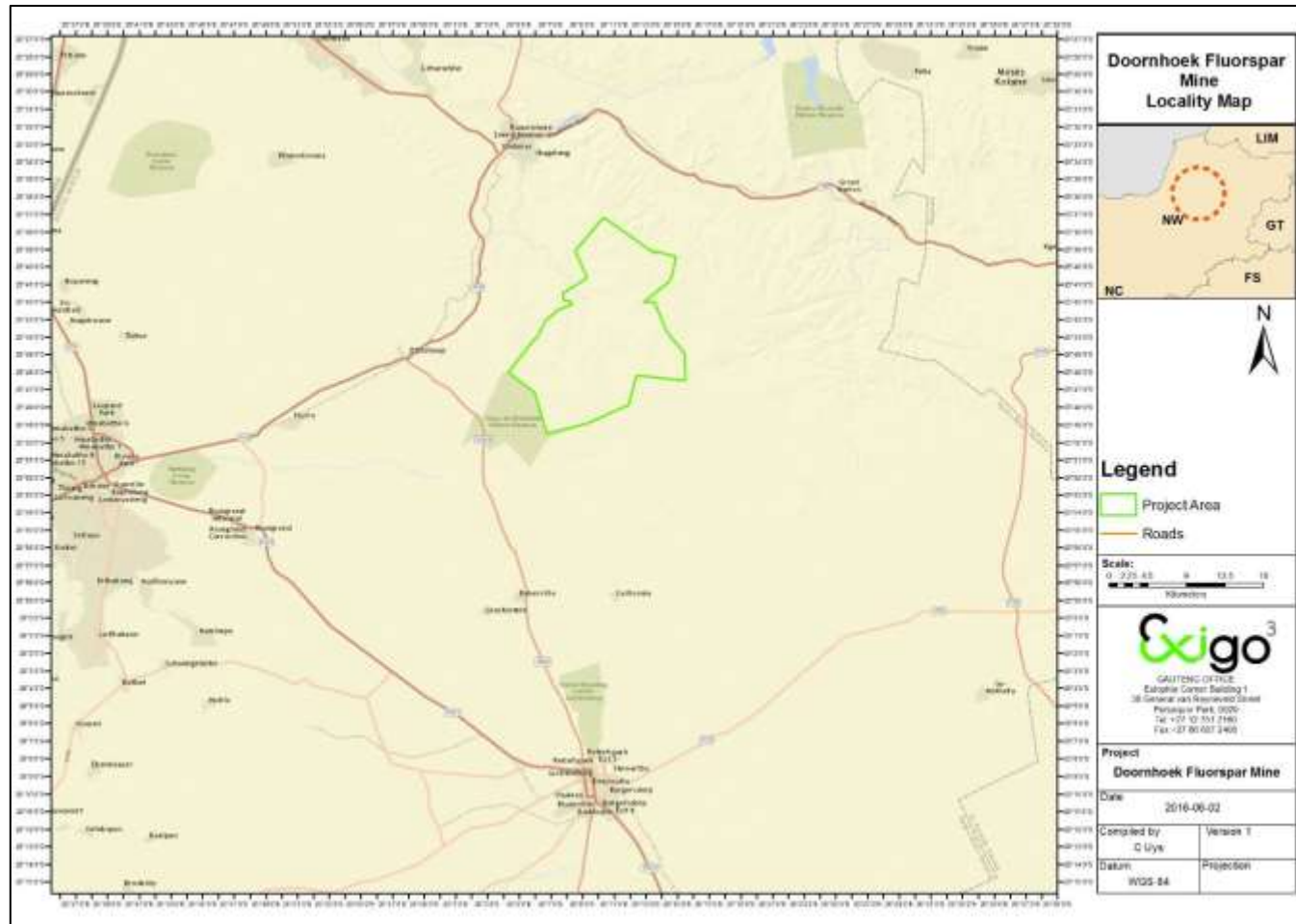


Figure 1-1: General locality of the Doornhoek Fluorspar Mine Project.

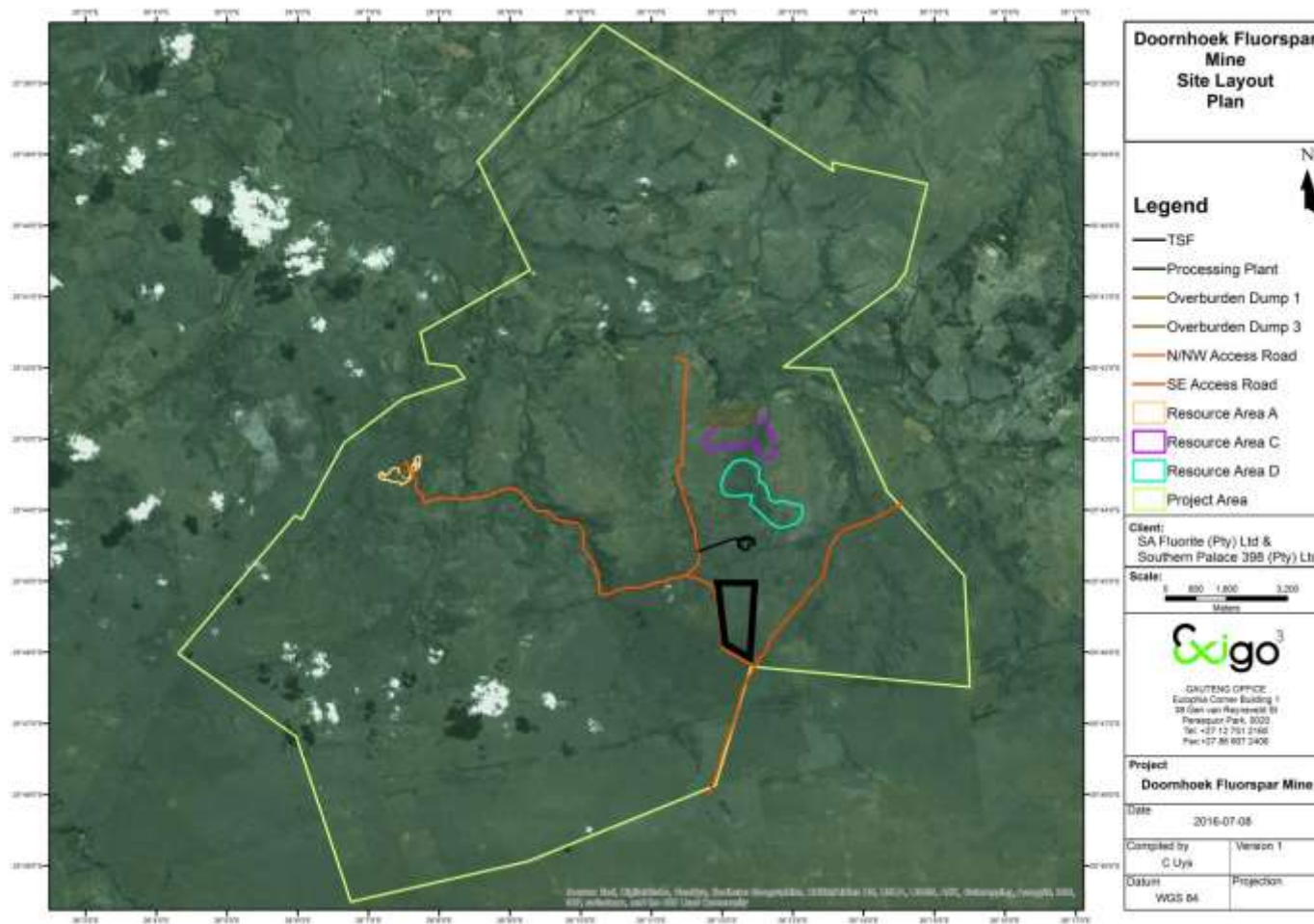


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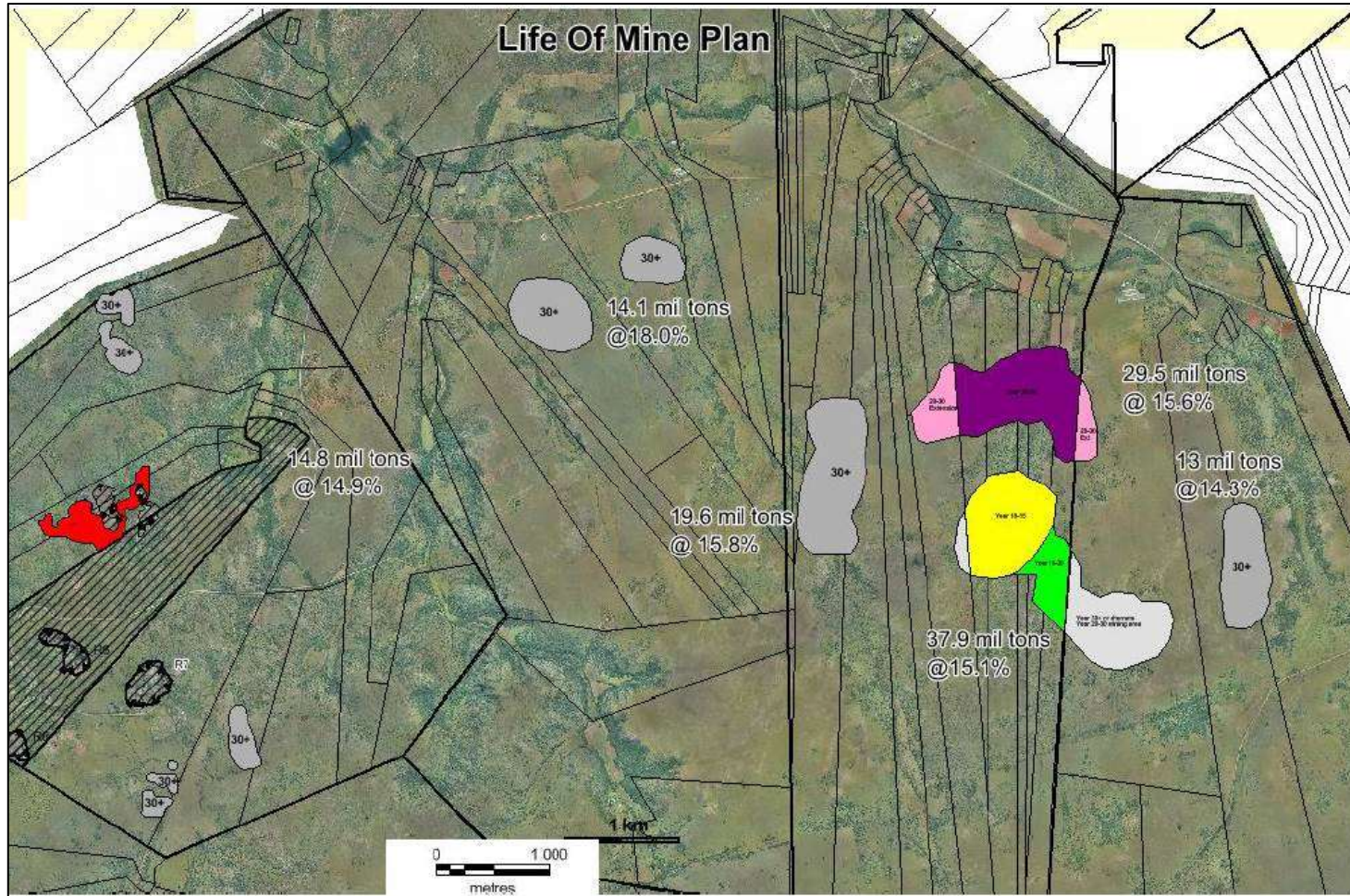


Figure 1-3: Open Pit Mining Schedule for the Doornhoek Fluorspar Mine Project.

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. Heritage specialist input in EIA processes can play a positive role in the development process by enriching an understanding of the past and its contribution to the present. It is also a legal requirement for certain development categories which may have an impact on heritage resources (Refer to Section 2.5.2).

Thus, EIAs should always include an assessment of Heritage Resources. 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)** and the **KwaZulu-Natal Heritage Act (KZNHRA - Act of 2008)**. In addition, the NHRA and the KZNHRA 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. Based hereon, this project functioned according to the following **terms of reference** for heritage specialist input:

- *Provide detailed updated description of all additional archaeological artefacts, structures (including graves) and settlements which may be affected, if any.*
- *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 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.*
- *Obtain a comment from the EC-PHRA.*

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 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.

a. 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-

- (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 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.

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.

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 m² 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 m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,*

must at the very earliest stages of initiating such a development, notify the responsible heritage resources

authority and furnish it with details regarding the location, nature and extent of the proposed development.”

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:

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) 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;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) 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;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) 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

1.6 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

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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 (EC-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 70 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, augering), 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 reinterment [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.

A fundamental aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information, which would otherwise be lost.

2 REGIONAL CONTEXT

2.1 Area Location

The Doornhoek Fluorspar Study area is located on Rhenosterfontein 304JP and Farm 306JP in the Ngaka Modiri Molema District Municipality area, generally at **S25.743828° E26.207856°**The study area appears on 1:50 000 Map Sheet 2531BD. It is located approximately 20km south of the town of Zeerust in the North West Province. The site is accessed via the P172-2 regional road (see Figure 2-1).

2.2 Area Description: Receiving Environment

The development site 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

vegetation and landscape features are usually fairly flat plains with open tree savanna. The project area is characterised by slightly to flat plains and lowlands with the Klein Marico River located to the south of the site. The topography across the site is slightly undulating to flat. Drainage occurs as sheet-wash and seepage towards the major rivers.

2.3 Site Description

The project footprint is located on Rhenosterfontein 304JP and Farm 306JP. The project area is defined as hills and lowlands (ENPAT, 2000). The topography of the area is a mixture of terrains, ranging from flat to moderately undulating plains, outcrops, bottomlands (drainage channels) and slightly undulating hills. The major land use in the area is game and cattle farming.

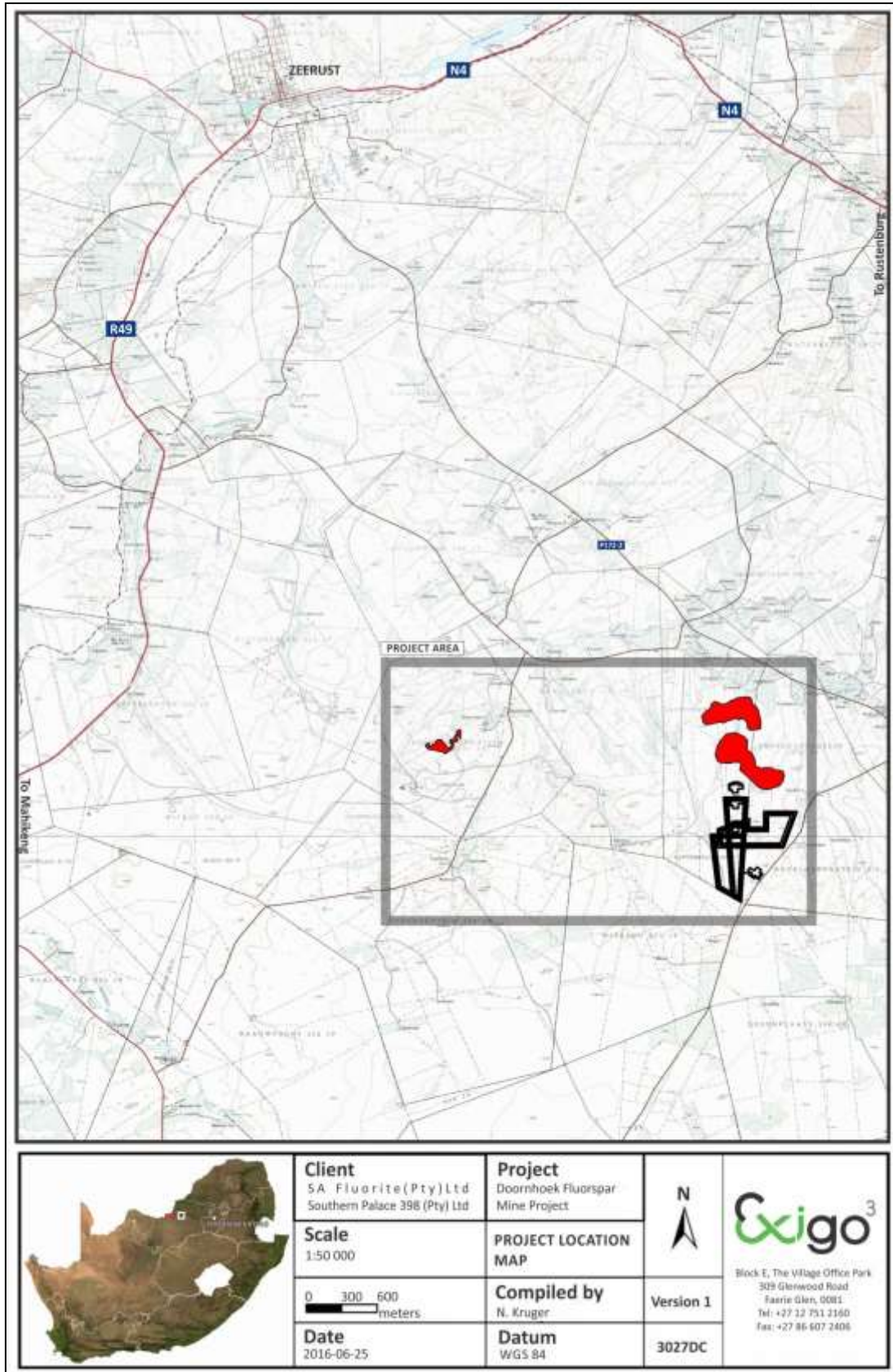


Figure 2-1: 1:50 00 Map representation of the location of the proposed Doornhoek Fluorspar Mine Project (sheet 2531BD).

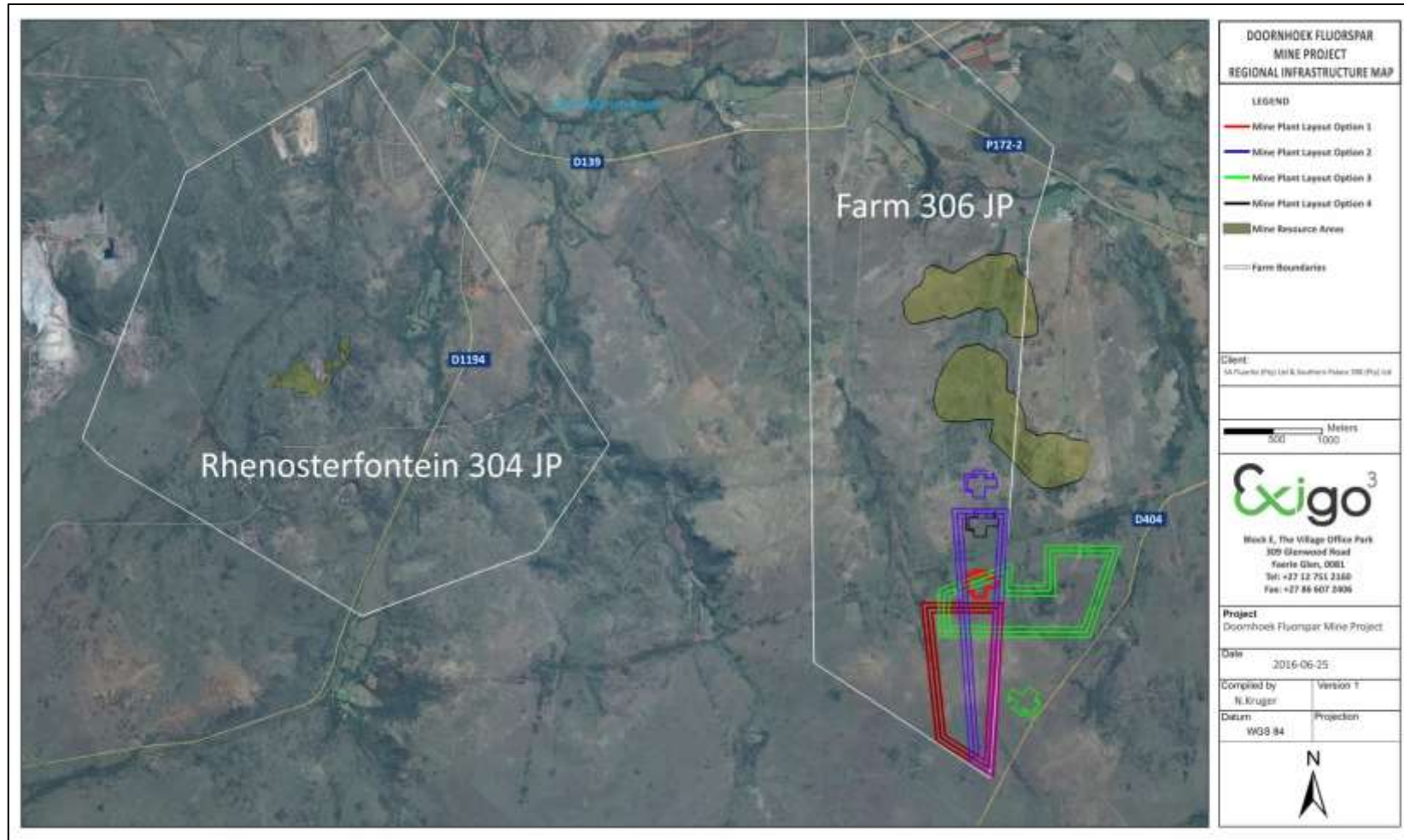


Figure 2-2: Aerial representation of the regional setting for the proposed Doornhoek Fluorspar Mine Project.



Figure 2-3: Panorama view of the general surroundings in the Doornhoek Fluorspar Mine 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

A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the Lowveld area and the larger landscape of this section of the North West Province. The desktop study examined a number of archaeological and historical impact assessments conducted in the Zeerust region. These included, amongst others:

- I. **Previous Research**
 - ***Historical Accounts and Research***

The North West Province was first formally documented by early travellers, explorer and missionaries that moved through areas surrounding the Marico River. Possibly the most valuable historical sources of information on the 18th century Marico are notes, maps and drawings, such as those compiled by John Campbell, a director of the London Missionary Society who frequented the area in 1820 and 1822.

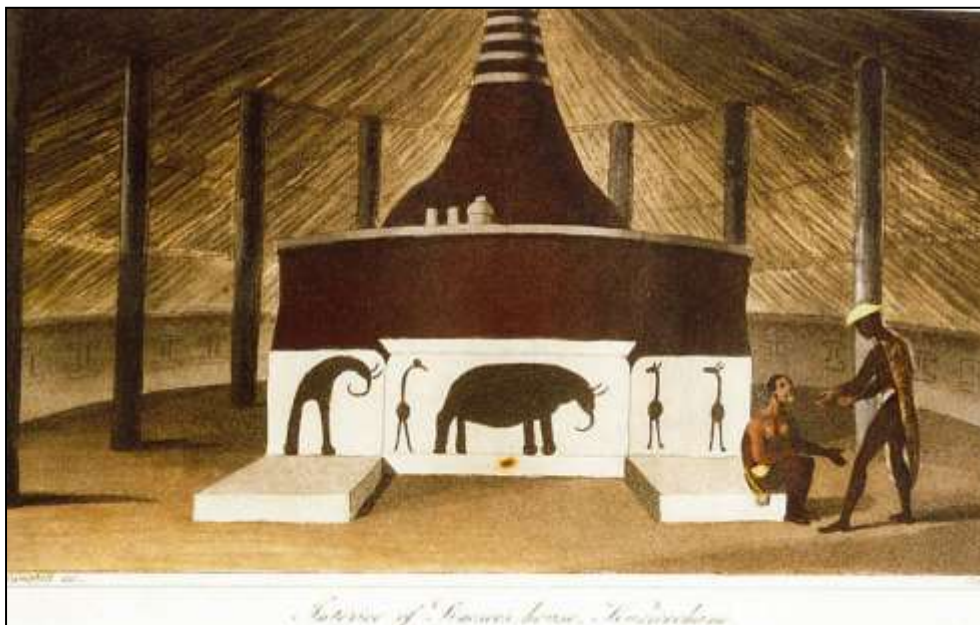


Figure 3-1: Interior of a hut, sketched by John Campbell during his journey to Kaditshwene in 1822.

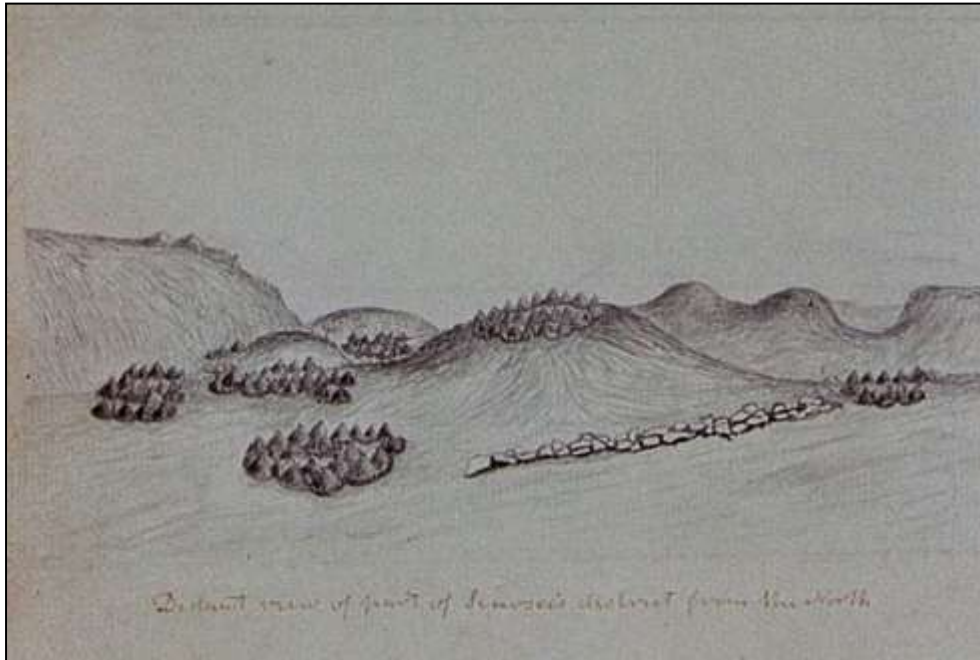


Figure 3-2: A sketch of the district of Senosi, Tswana headman.

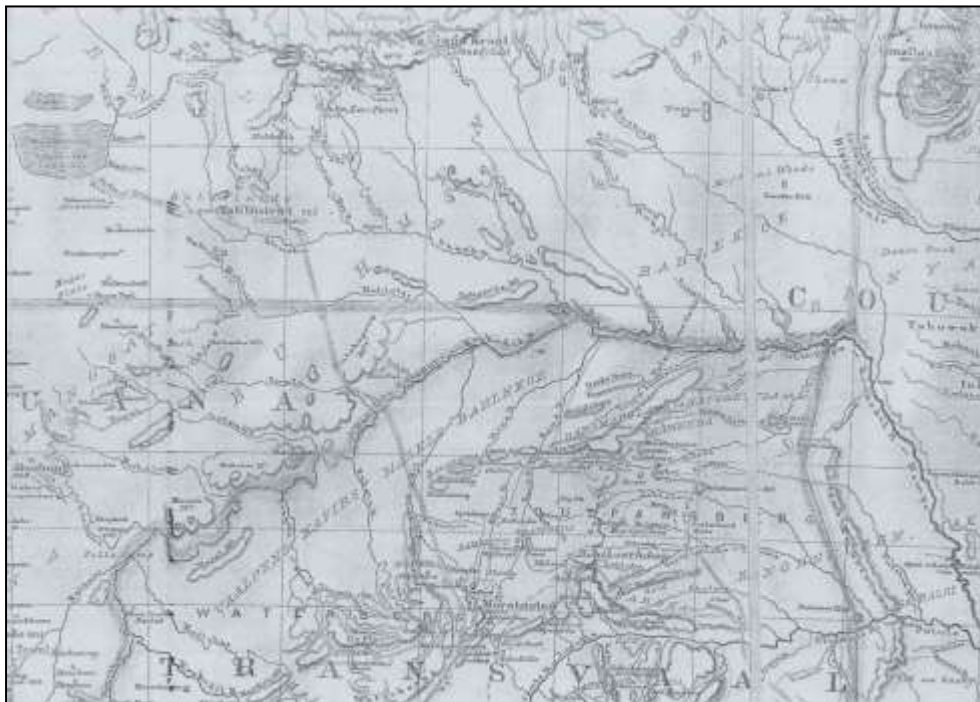


Figure 3-3: "Map of the Transvaal", compiled by Alexander Merensky c.1880.

Later research in the area includes important work by Government Ethnologist N.J van Warmelo in the first part of the 20th century as well as work by ethnographers such as P Breutz and Izaak Schapera. In recent years, the North West Province cultural landscape has been the subject of frequent archaeological and historical studies. Middle and Later Stone Age occurrences dating to the last two millennia, particularly Rock Art and stone implements have been extensively investigated by Maria Van Der Ryst, Bronwyn Van Doornum and Sven Ouzman. TM Evers, Revil Mason, Simon Hall, Jan Boeyens and Tom Huffman, amongst others informed on the history of Iron Age farming communities and the significant Tswana towns during the first and early second millennia AD in their research.

- **Heritage and Archaeological impact Assessment Reports**

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

- A Cultural Heritage Survey of the PPC Slurry Operation near Zeerust by F Coetzee in 2008.
- A Heritage Scoping for a proposed development on Portion 32 of the Farm Klaarstroom 267 J near Zeerust, by W. Fourie in 2008.
- The Kameeldoorn Archaeological Survey, near Zeerust by T.N Huffman in 2008.
- A Cultural Heritage Resources Impact Assessment of Proposed Resort Development in Poesedumane in Zeerust, by U Kusel in 2007.
- An Archaeological and Historical Investigation and Exhumation of Three Graves on Plot 1242 in Zeerust, by A Pelsler, in 2008.
- A Report on the Preliminary Investigation of Two Historical Graves on Plot 1242 in Zeerust, by A Pelsler, in 2007.
- A Phase 1 Heritage Impact Assessment study for a proposed photovoltaic solar power installation (solar plant) at Harmony's Kalgold mine south-west of Mahikeng, by J Pistorius in 2011.
- Reconnaissance of Remaining Cultural Resources in the Bakerville Diamond Fields by J Van Schalkwyk, R de Jong & S Smith in 1995.

3.1.2 Aerial Representations and Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied intensively to aid the pedestrian and vehicular survey of the Doornhoek Fluorspar Mine Project area, where contour lines of elevations, depressions, variation in vegetation, soil marks and landmarks were examined. 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 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.

By superimposing high frequency aerial photographs and LiDAR digital terrain models (DTM) with images generated with Google Earth, potential sensitive areas were subsequently identified, geo-referenced and transferred to a handheld GPS device. In addition, based on existing knowledge of the local heritage landscape, the areas subject to the site inspections were divided into smaller survey zones centred around areas of higher site catchment probability (where human activity was likely to occur in prehistoric and historic times e.g. around water sources, near soils fit for agriculture, on ridges). These survey zones were then transferred to a handheld GPS device. These areas served as referenced points from where further vehicular and pedestrian surveys were carried out.

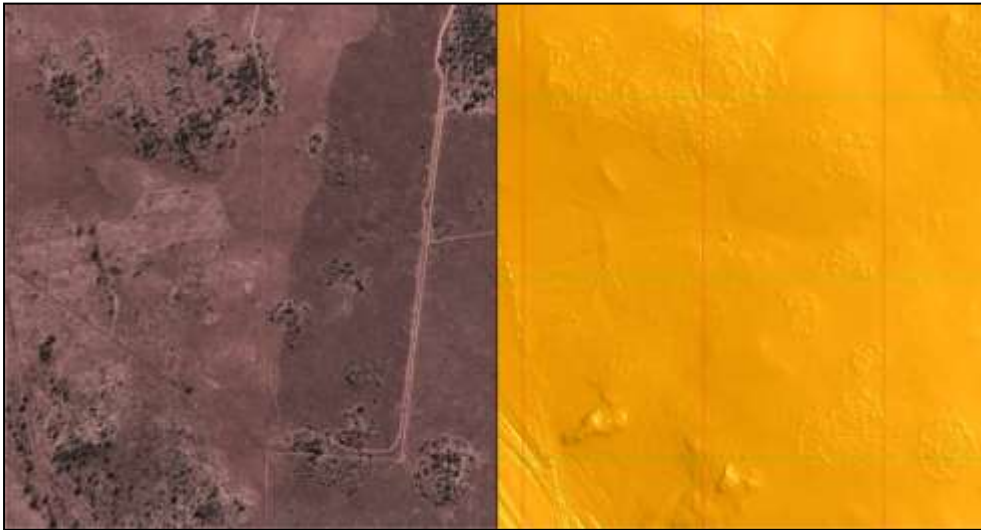


Figure 3-4: Aerial and LiDAR imagery of stone walled settlements (Cluster 2) in the study area.

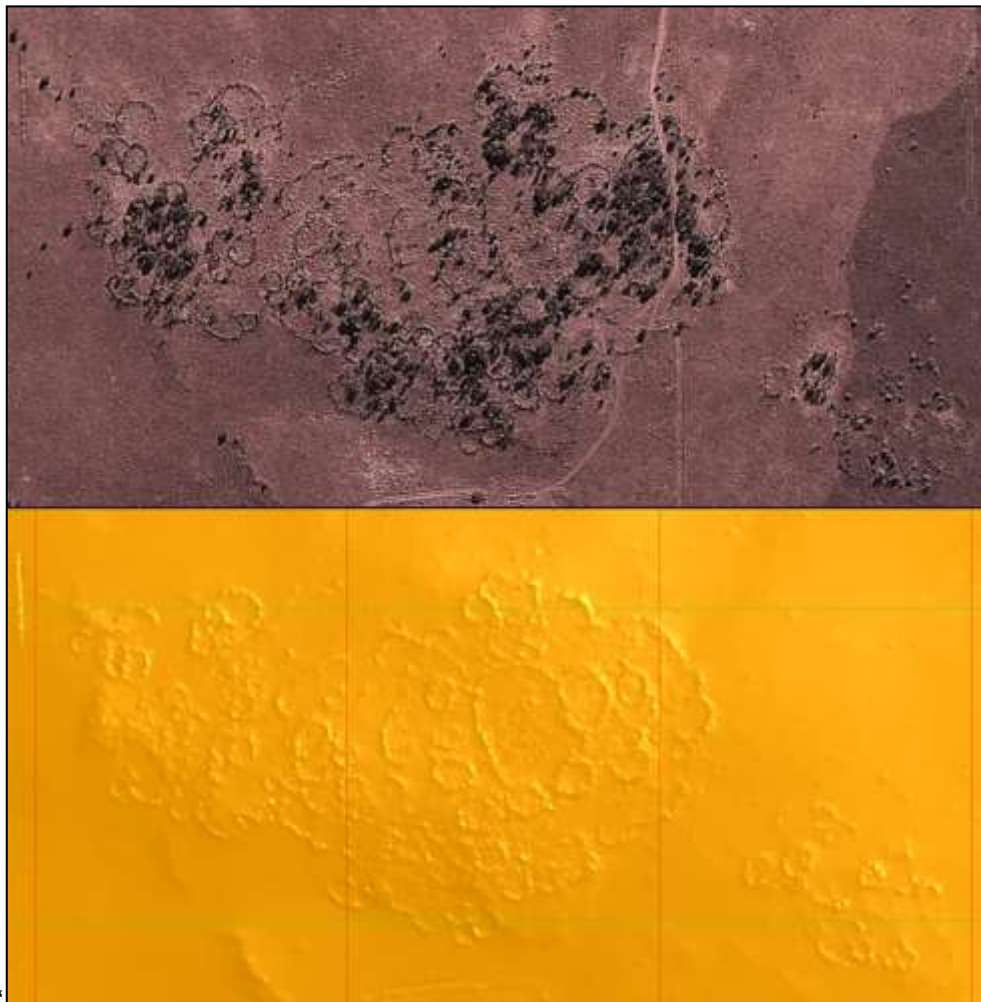


Figure 3-5: Detailed aerial and LiDAR imagery of a large stone walled settlement in the study area.

3.1.3 Mapping out of Sites

By merging data generated during the desktop study and the aerial survey areas of heritage potential were plotted on 1:50 000 topographic maps of the Zeerust area using ArcGIS 9.3. These maps were then superimposed on high definition aerial and LiDAR representations in order to graphically demonstrate the geographical locations and distribution of sensitive areas. Information on areas with dense clusters of heritage sites were expanded in the text employing academic and research based literature.

3.1.4 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the footprint area proposed for the Doornhoek Fluorspar Mine Project was conducted in June 2016. The process encompassed a systematic field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to sample surface areas systematically and to ensure a high probability of site recording, the project areas were systematically surveyed on foot by means of a transect survey. GPS reference points identified during the aerial survey were also visited and random spot checks were made (see detail in previous section). Using a Garmin E-trex Legend GPS objects and structures of archaeological / heritage value were recorded and photographed with a Canon 450D 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.

3.1.5 General Public Liaison

In a number of instances, consultation with local residents and farmers provided information on the general history of the area, possible locations of heritage resources and brief commentaries on the recent history of the area.

3.2 Limitations

3.2.1 Access

The project site for the Doornhoek Fluorspar Mine Project is accessed from the P172-2 regional road as well as a number of smaller dirt roads. Access control is applied to the properties subject to this study but no restrictions were encountered during the site visit.

3.2.2 Visibility

The surrounding vegetation in the study area is mostly comprised out of mixed grasslands and scattered trees as well as pioneering species in disturbed areas. As such, the general visibility at the time of the AIA survey (June 2016) was moderate due to surface vegetation and obstruction (see Figures 3-6 to 3-19). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.



Figure 3-6: View of general surroundings on a high ridge on the Farm Rhenosterfontein in demarcated resource areas.



Figure 3-7: View of general surroundings on the Farm Rhenosterfontein, looking east towards an old quarry.



Figure 3-8: View of general surroundings on the Farm Rhenosterfontein in demarcated resource areas.



Figure 3-9: General surroundings on Farm 306 JP in demarcated resource areas.



Figure 3-10: General surroundings on Farm 306 JP in demarcated resource areas.



Figure 3-11: A small ridge along the eastern boundary of Farm 306 JP in demarcated resource areas.



Figure 3-12: Cleared surfaces on Farm 306 JP in demarcated resource areas.



Figure 3-13: View of the eastern periphery of Farm 306 JP in demarcated resource areas..



Figure 3-14: View of general surrounding along the southern boundary of Farm 306 JP in areas proposed for the mine plant.



Figure 3-15: View of general surrounding along the southern boundary of Farm 306 JP in areas proposed for the mine plant.



Figure 3-16: View of general surrounding along the southern boundary of Farm 306 JP in areas proposed for the mine plant.



Figure 3-17: View of the south-eastern boundary of Farm 306 JP in an alternative area proposed for the mine plant.



Figure 3-18: View of a small hill in the south-eastern sector of Farm 306 JP in an alternative area proposed for the mine plant.



Figure 3-19: View of the eastern boundary of Farm 306 JP in an alternative area proposed for the mine plant.

3.2.3 Limitations and Constraints

The pedestrian site survey for the Doornhoek Fluorspar Mine Project Project AIA primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment. The following constraints were encountered:

- **Survey Time and Extent:** Survey time proved to be a constraint due to the relatively large surface extent of the footprint area. Therefore, pedestrian site surveys focused around areas tentatively identified as sensitive (i.e. along drainage lines and those noted during the aerial survey) during aerial surveys.
- **Visibility:** Visibility proved to be somewhat of a constraint in areas with denser surface cover, as well as portions where vegetation is more pristine.

Thus, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Doornhoek Fluorspar Mine Project, 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 Plomp¹ impact assessment matrix scale supplied by Exigo. According to this matrix scale, each heritage receptor in the study area is given an impact assessment. A cumulative assessment for the proposed project is also included.

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

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: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens sapiens</i> 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	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	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	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.
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.

¹ Plomp, H.,2004

4.1.1 The Stone Ages

- The Earlier Stone Age (ESA)

The Earlier Stone Age from between 1.5 million and 250 000 years ago refers to the earliest that *Homo sapiens sapiens* predecessors began making stone tools. The earliest stone tool industry was referred to as the Olduvai Industry originating from stone artefacts recorded at Olduvai Gorge, Tanzania. The Acheulian Industry, the predominant Southern African Early Stone Age Industry, replaced the Olduvai Industry approximately 1.5 million years ago, is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. Bifaces emerged in East Africa more than 1.5 million years ago but have been reported from a wide range of areas, from South Africa to northern Europe and from India to the Iberian coast. Earlier Stone Age deposits typically occur on the flood-plains of perennial rivers. These ESA open sites sometimes contain stone tool scatters and manufacturing debris ranging from pebble tool choppers to core tools such as handaxes and cleavers. These groups seldom actively hunted and relied heavily on the opportunistic scavenging of meat from carnivore kill sites. The most well-known Early Stone Age site in Southern Africa is Amanzi Springs, situated about 10km north-east of Uitenhage, near Port Elizabeth (Deacon 1970). In a series of spring deposits a large number of stone tools were found in situ to a depth of 3-4m. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old.

- The Middle Stone Age (MSA)

The Middle Stone Age (MSA) spans a period from 250 000-30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism. Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across Southern Africa dating within the last 120 000 years (Thompson & Marean 2008). The large handaxes and cleavers were replaced by smaller stone artefacts called the MSA flake and blade industries. Surface scatters of these flake and blade industries occur widespread across Southern Africa although rarely with any associated botanical and faunal remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may in rare cases be associated with MSA occurrences (Gess 1969). These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material. The MSA is distinguished from the ESA by the smaller-sized and distinctly different stone artefacts and chaîne opératoire (method) used in manufacture, the introduction of other types of artefacts and evidence of symbolic behaviour. The prepared core technique was used for the manufacture of the stone artefacts which display a characteristic faceted striking platform and includes mainly unifacial and bifacial flake blades and points. The Howiesons Poort Industry (80 000-55 000 years ago) is distinguished from the other MSA stone artefacts: the size of tools are generally smaller, the range of raw materials include finer-grained rocks such as silcrete, chalcedony, chert and hornfels, and include segments, backed blades and trapezoids in the stone toolkit which were sometimes hafted (set or glued) onto handles. In addition to stone artefacts, bone was worked into points, possibly hafted, and used as tools for hunting (Deacon & Deacon 1999). Other types of artefacts that have been encountered in archaeological excavations include tick shell beads, the rim pieces of ostrich eggshell (OES) water flasks, ochre-stained pieces of ostrich eggshell and engraved and scratched ochre pieces, as well as the collection of materials for purely aesthetic reasons. The majority of MSA sites occur on flood plains and sometimes in caves and rock shelters. Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as

those used in hafting, seldom remain preserved in the archaeological record. Limited drive-hunting activities are associated with the MSA.

- **The Later Stone Age (LSA)**

The Later Stone Age (LSA) spans the period from about 20 000 years ago until the colonial era, although some communities continue making stone tools today. The period between 30 000 and 20 000 years ago is referred to as the transition from the MSA to LSA; although there is a lack of crucial sites and evidence that represent this change. By the time of the Later Stone Age the genus *Homo*, in southern Africa, had developed into *Homo sapiens sapiens*, and in Europe, had already replaced *Homo neanderthalensis*. The LSA is marked by a series of technological innovations, new tools and artefacts, the development of economic, political and social systems, and core symbolic beliefs and rituals. The stone toolkits changed over time according to time-specific needs and raw material availability, from smaller microlithic Robberg, Wilton Industries and in between, the larger Albany/Oakhurst and the Kabeljous Industries. Bored stones used as part of digging sticks, grooved stones for sharpening and grinding and stone tools fixed to handles with mastic also become more common. Fishing equipment such as hooks, gorges and sinkers also appear within archaeological excavations. Polished bone tools such as eyed needles, awls, linkshafts and arrowheads also become a more common occurrence. Most importantly bows and arrows revolutionized the hunting economy. It was only within the last 2000 years that earthenware pottery was introduced, before then tortoiseshell bowls were used for cooking and ostrich eggshell (OES) flasks were used for storing water. Decorative items like ostrich eggshell and marine/fresh water shell beads and pendants were made. Hunting and gathering made up the economic way of life of these communities; therefore, they are normally referred to as hunter-gatherers. Hunter-gatherers hunted both small and large game and gathered edible plant foods from the veld. For those that lived at or close the coast, marine shellfish and seals and other edible marine resources were available for the gathering. The political system was mainly egalitarian, and socially, hunter-gatherers lived in bands of up to twenty people during the scarce resource availability dispersal seasons and aggregated according to kinship relations during the abundant resource availability seasons. Symbolic beliefs and rituals are evidenced by the deliberate burial of the dead and in the rock art paintings and engravings scattered across the Southern African landscape. Sites dating to the LSA are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

4.1.2 The Iron Age Farmer Period

- **Early Iron Age (Early Farming Communities)**

The Early Iron Age (also Early Farmer Period) marks the movement of Bantu speaking farming communities into South Africa at around 200 A.D. These groups were agro-pastoralists that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Artefact evidence from Early Farmer Period sites is mostly found in the form of ceramic assemblages and the origins and archaeological identities of this period are largely based upon ceramic typologies and sequences, where diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. Early Farmer Period ceramic traditions are classified by some scholars into different “streams” or trends in pot types and decoration that, over time emerged in Southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the Kalundu Branch (west). More specifically, in the northern regions of South Africa at least three settlement phases have been distinguished for prehistoric Bantu-speaking agro-pastoralists. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by

herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. Early Farmer Period ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. The Early Iron Age continued up to the end of the first millennium AD.

- **Middle Iron Age / K2 Mapungubwe Period (early Later Farming Communities)**

The onset of the middle Iron Age dates back to ±900 AD, a period more commonly known as the Mapungubwe / K2 phase. These names refer to the well-known archaeological sites that are today the pinnacle of South Africa's Iron Age heritage. The inhabitants of K2 and Mapungubwe, situated on the banks of the Limpopo, were agriculturalists and pastoralists and were engaged in extensive trade activities with local and foreign traders. Although the identity of this Bantu-speaking group remains a point of contestation, the Mapungubwe people were the first state-organized society Southern Africa has known. A considerable amount of golden objects, ivory, beads (glass and gold), trade goods and clay figurines as well as large amounts of potsherds were found at these sites and also appear in sites dating back to this phase of the Iron Age. Ceramics of this tradition take the form of beakers with upright sides and decorations around the base (K2) and shallow-shouldered bowls with decorations as well as globular pots with long necks. (Mapungubwe). The site of Mapungubwe was deserted at around 1250 AD and this also marks the relative conclusion of this phase of the Iron Age.

- **Later Iron Age (Later Farming Communities)**

The late Iron Age of Southern Africa marks the grouping of Bantu speaking groups into different cultural units. It also signals one of the most influential events of the second millennium AD in Southern Africa, the difaqane. The difaqane (also known as "the scattering") brought about a dramatic and sudden ending to centuries of stable society in Southern Africa. Reasons for this change was essentially the first penetration of the Southern African interior by Portuguese traders, military conquests by various Bantu speaking groups primarily the ambitious Zulu King Shaka and the beginning of industrial developments in South Africa. Different cultural groups were scattered over large areas of the interior. These groups conveyed with them their customs that in the archaeological record manifest in ceramics, beads and other artefacts. This means that distinct pottery typologies can be found in the different late Iron Age groups of South Africa.

- **Bantu Speaking Groups in the South African interior**

It should be noted that terms such as "Nguni", "Sotho", "Venda" and others refer to broad and comprehensive language groups that demonstrated similarities in their origins and language. It does not imply that these Nguni / Sotho groups were homogeneous and static; they rather moved through the landscape and influenced each other in continuous processes marked by cultural fluidity.

Ethnographers generally divide major Bantu-speaking groups of Southern Africa into two broad linguistic groups, the Nguni and the Sotho with smaller subdivisions under these two main groups. Nguni groups were found in the eastern parts of the interior of South Africa and can be divided into the northern Nguni and the southern Nguni. The various Zulu and Swazi groups were generally associated with the northern Nguni whereas the southern Nguni comprised the Xhosa, Mpondo, Thembu and Mpondomise groups. The same geographically based divisions exist among Sotho groups where, under the western Sotho (or Tswana), groups such as the Rolong, Hurutshe, Kwena, Fokeng and Kgatla are found. The northern Sotho included the Pedi and amalgamation of smaller groups united to become the southern Sotho group or the Basutho. Other smaller language groups such as the Venda, Lemba and Tshonga Shangana transpired outside these major entities but as time progressed they were, however to lesser or greater extent influenced and absorbed by neighbouring groups.

4.1.3 Pastoralism and the last 2000 years

Until 2000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2000 years ago the social dynamics of the Southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. One of these groups, the Khoekhoe pastoralists or herders entered Southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of Southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

4.1.4 Historical and Colonial Times and Recent History

The Historical period in Southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in Southern Africa.

4.2 The North West Province: Specific Themes.

The landscape of the Marico 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 Marico River have provided water, the fertile soil surrounding the rivers have provided food and the strategically situated hills and plains in the landscape sheltered many groups of people and many generations. Thus, the area presents the most important time periods in the history of South Africa, 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 spectacular stone walling of previous Tswana inhabitants, to rock paintings and engravings.

4.2.1 The Earlier and Middle Stone Ages

Results from studies on the Earlier Stone Age show that sites dating back to 2.5 million years ago occur in areas around the Marico River and sites have been identified in riverbank deposits at many of other larger rivers and tributaries in the area. 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 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, e.g. around Buispoort. 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 and North West River horizons 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, the land around Mafikeng in the North West Province of South Africa was inhabited for thousands of years by the Khoisan people. The Khoisan lived closely in tune with nature, in nomadic groups of hunter-gatherers. Stone engravings up to several thousand years old are often found on the rocky outcrops in this region.

4.2.2 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. 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 have been identified in the North West and Limpopo Province areas; 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.

- 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. 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 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 North West 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 they were probably made by hunter-gatherers.

- **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.

4.2.3 The Iron Age / Farmer Period

Early Iron Age farming communities practised a mixed economy consisting of plant cultivation and stock herding in the interior of South Africa during the first half of the first millennium AD. These Bantu-Negroid people, who probably interbred with the local San and Khoi-Khoi, were ironworkers of some repute and established the first permanent villages south of the Limpopo River. The landscape of the North West Province is dominated by massive Sotho-Tswana stone-walled mega sites and their ceramic tradition, known as Moloko. The Moloko ceramic tradition reflects the migration of the Sotho-Tswana to South Africa. The name Moloko is derived from the old Pedi (North Sotho) word for tribe and, according to Evers (1981:98), signifies the manner in which the Sotho-Tswana spread over the country through a process of

lineage segmentation or splitting of tribes. The Moloko Tradition can be divided into two phases: an early phase in which sites were usually located at the foot of hills and contained little or no stone walling; and a later phase characterised by extensive stone wall complexes which were often erected on hills. The best-preserved Early Moloko site is Olifantspoort 29/72 near Rustenburg.

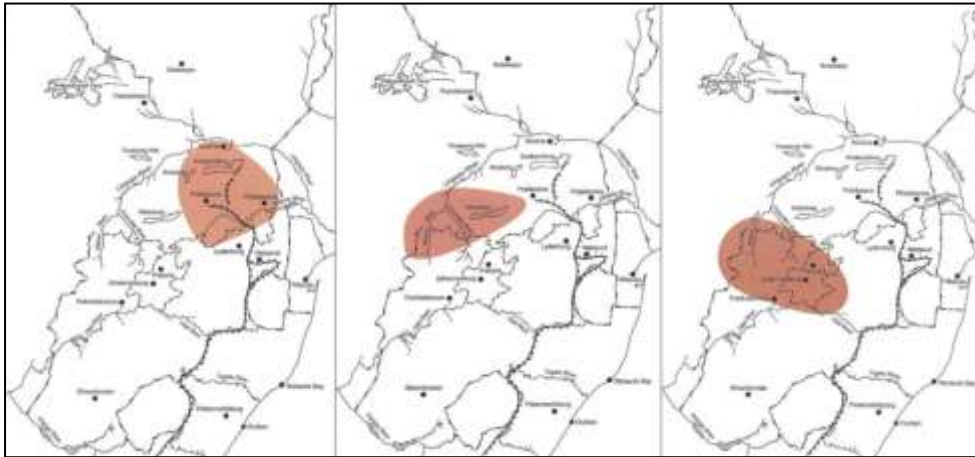


Figure 4-1: Map detailing the distribution of 16th century Moloko (left), 17th century Madikwe (centre) and 18th century Buispoort tradition sites (After Huffman 2007).



Figure 4-2: Ceramic decoration motives typical of 17th century Madikwe (left) and later Buispoort (right) facies (After Huffman 2007)..

The second phase of the Moloko Tradition is associated with the large number of stone-walled complexes found in Gauteng, North West and Mpumalanga, as well as the Free State. The stone walls were erected to construct stock byres and to demarcate residential units; huts were pole-and-dagha structures except in some cases in the Free State, where corbelled stone huts were built. There is still no clarity about why the Late Iron Age inhabitants started building with stone or exactly when the Late Moloko phase commenced. According to Mike Evers (1988:129), the majority of radiocarbon dates indicate that the stone wall phase began in about the middle of the 17th century AD. The few dates which suggest that some of the stone-walled complexes had been occupied earlier derive from the base of ash heaps and, according to him, may not date the human occupation of the sites.

During the second half of the 18th century, some of these stone-walled complexes, especially those occupied by Tswana communities in what is now known as the North West Province, expanded into enormously large settlements covering several kilometres. Good examples of these "megasites", as they have been described by Revil Mason, are Molokwane, the capital of the Bakwena-ba-Modimosana-ba-Mmatau near present-day Rustenburg, and Kaditshwene, the capital of the Hurutshe near the modern town of Zeerust. Factors which contributed to this process of aggregation include population growth, reduced access to unoccupied land, political centralisation, and the incorporation of foreign groups through the ward system. It has also been suggested that these large settlements among the Tswana were the outcome of military pressure as a result of raids by the Kora (Korana) and the Griqua from the south, as well as escalating conflicts among neighbouring Tswana chiefdoms, which preceded the upheavals of the so-called difaqane or mfecane. Both Molokwane and Kaditshwene were evacuated in the early 1820s during the difaqane, a period of conflict during which many African communities were attacked and dislodged, first, by refugee Sotho groups, who had been driven from the Free State and, finally, by the Ndebele (Matabele) of Mzilikazi, who had migrated from KwaZulu-Natal.

4.2.4 Archaeo-Metallurgy and Prehistoric Mining

Africa is fortunate as its general geology is such that iron deposits exist almost everywhere in some level of mine-able ore - from solid nuggets of hematite to iron ore dust or clays rich in iron. In South Africa, the Later Iron Age is characterised by a greater degree of economic specialisation where villages were no longer self-sufficient units; instead, there was greater regional interdependency and more emphasis on trade. Iron smelting activities no longer occurred on most sites; instead, there were a number of main centres which specialised in the mining and production of iron. Phalaborwa in the Limpopo Province was one of the most important iron and copper production centres. Iron was used mainly to manufacture hoes, knife-blades, axes, spears, adzes, awls and metalworking tools. In addition, it also acted as currency and bridal wealth (lobola) as well as fulfilling ceremonial and political functions.

Copper production was even more restricted and there is little evidence of copper-working south of the Vaal and the Nkomati Rivers. Copper and bronze were used to manufacture ornaments such as beads, earrings and arm bangles. Tin was mined at Rooiberg near Warmbaths/Bela-Bela in the Limpopo Province, while gold objects, particularly beads, were recovered from a few sites such as Mapungubwe and Machedema in the Limpopo Province and Thulamela in the Kruger National Park. Metal products were important trade items during the Late Iron Age. Furnaces were usually constructed in an oval shape with at least two vents that held the tuyères or blowpipes that were attached to bellows. Grass, charcoal and wood was used to reach temperatures of up to 1500°C inside the furnace, sufficient to reduce iron ore to iron.

The role of metallurgy in the cultural life ways of metal workers in Africa is sophisticated and includes much more than just the practical value associated with metals. In unstratified societies metal smiths were free independent agents and part-time specialists that conserved their knowledge. In some instances smaller clans or settlements had their own metal smiths. Metal smiths were respected and did not easily share knowledge of the practise but they sometimes would employ helpers such as bellow operators. In stratified societies metal smiths were not independent and they had to pay dues to a chief or king. With the appearance of large states in Africa, metal smiths were permanently hired by royalty in order to perform iron smelting practices. Iron smelting was almost without exception, a highly ritualised activity with a deep symbolic meaning. Communication and consent from the ancestors was crucial in order to successfully reduce iron ore. It was also believed that the furnaces and the iron smelting area had to be purified and

that certain aspects would render it unclean.

The implication of the ritual association with iron smelting was that:

- the iron smelting areas were positioned outside settlement areas and usually out of line of sight of the villages and villagers. In many cases these areas were situated behind hills or kopjes.
- the metal smiths had to seclude themselves during the time of iron reduction. They had to abstain from sexual activities and they were not to come into contact with menstruating women ("unclean women").
- the iron smiths were supplied with food by young girls or older women. Any woman biologically capable of menstruation had to keep away from the activities.

4.2.5 Later History and Colonial Period

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. The earliest European explorers of the Transvaal left behind a wealth of data on Iron Age peoples e.g. John Campbell (see previous comments). The Town of Zeerust was established on the farm Sefathlani / Sebatlani (meaning dusty place) belonging to Casper Hendrik Coetzee who bought it in 1858. The farm was later renamed Hazenjacht, and after that Hazia / Hazeah. Casper Coetzee contracted Walter Seymore to build a church and a fort on this farm, but Casper died before this was completed. In 1866, the farm then came into the hands of his cousin / Brother-in-law Diederik Jacobus Coetzee, who saw the potential of developing a town on the farm. He measured out some erven with the idea of starting a town, using "Ox riems" to measure out the plots instead of the accepted surveyors chains. On 20 March 1867, the first erven of the newly established Coetzee-Rust were sold per public auction in Potchefstroom, before official recognition of the request to start a town was granted. The name Coetzee's Rust was later abbreviated to Zeerust. Municipal status was obtained on 18 March 1936.

4.2.6 The Anglo Boer War

Possibly the most prominent colonial remnants in the Mafikeng and Zeerust landscape can be attributed to the South African War or the Anglo-Boer War (1899-1902), interestingly enough the first shots of both the 1st and 2nd Anglo-Boer Wars were fired in the North West Province. Thus, the various battles and skirmishes resulting from this influential conflict left a legacy of heritage sites scattered across the Transvaal where fortifications, war cemeteries and battlefields still remain.

Throughout the 19th century, after Great Britain had acquired the Cape of Good Hope in 1814 and expanded its possessions in southern Africa, ill feeling mounted between the Afrikaners, or Boers, and British settlers. This resulted in the Great Trek (1835-1843) and the consequent establishment of the Afrikaner republics: Natal, Orange Free State, and the South African Republic. Natal became a British colony in 1843, but the Transvaal territories were granted independence from Great Britain in 1852, and Orange Free State in 1854. In the late 1850s, the Transvaal territories formed the South African Republic. The stage for war was set in 1884, when gold was discovered in the Witwatersrand, a region then encompassing parts of the southern Transvaal. The discovery lured thousands of British miners and prospectors to settle in the area, the influx being so great that the city of Johannesburg was created almost overnight.

The Afrikaners, primarily farmers, resented the newcomers, whom they called Uitlanders (“foreigners”), and in token of their feeling, taxed them heavily and denied them voting rights. The resentment on both sides grew, ultimately leading to a revolt by the Uitlanders in Johannesburg against the Afrikaner government. This revolt was instigated by the British colonial statesman and financier Cecil Rhodes, then premier of the Cape Colony, who desired to bring all of southern Africa into the British Empire. In December 1895, Leander Starr Jameson, a friend of Rhodes, led a band of 600 British armed men in an unauthorized attempt to support the rebellious Uitlanders in the South African Republic. Called the Jameson Raid, the venture resulted in Jameson's capture and imprisonment and in Rhodes's resignation. Jameson later served as premier of the Cape Colony from 1904 to 1908. Direct negotiations to solve the South African problem proved unfruitful, and hostility between the Afrikaners and the Uitlanders continued unabated. The president of the South African Republic, Paul Kruger, was unyielding in his opposition to the Uitlanders. In 1899 the recently appointed British governor of Cape Colony, Alfred Milner, who strongly resented the Afrikaners' treatment of British subjects, issued orders to build up the 12,000-man British army contingent then in southern Africa into a force of at least 50,000 troops. On October 9, 1899, Kruger demanded the withdrawal of all British troops from the Transvaal frontiers within 48 hours, with the alternative of formal war. British non-compliance with Kruger's demands brought immediate action, and an alliance of the South African Republic and the Orange Free State declared war on October 12, 1899. Boer forces under the command of General De la Rey attacked the British garrison and railway siding at Kraaipan, south west of Mafikeng, thereby signalling the start of the Anglo-Boer War.

The North West province saw a number of important battles as both sides sought control of the main railway link to the north. The Afrikaner forces were initially successful, invading Natal and Cape Colony. Within days they succeeded in surrounding British forces at Ladysmith, Natal, and at Mafeking (now Mafikeng) and Kimberley, Cape Colony. In December the British commander in chief Sir Redvers H. Buller sent fresh troops to relieve besieged British forces in three areas of the war zone: Colenso, Natal; the hills of Magersfontein on the Orange Free State and Cape Colony borders; and the mountain range of Stormberge in the Cape Colony. Within a week's time, referred to as Black Week by the British, each of the new units had been defeated by Afrikaner forces.

On January 10, 1900, the British general Frederick S. Roberts was sent to replace Buller as commander in chief. (Buller, however, remained to fight throughout the war). Early in February, Roberts ordered the British commander John D. P. French north to relieve the city of Kimberley; French's objective was attained four days later. Simultaneously, Roberts undertook a north-eastward march from Cape Colony into the Orange Free State. Attacked by the Afrikaner general Piet Cronje on February 27, Roberts fought back successfully and forced the surrender of Cronje and his troops, altogether about 4000 men. On March 13, Roberts entered Bloemfontein, capital of the Orange Free State. Two months later, on May 17, besieged Mafeking, defended by troops under the command of the British soldier Robert Baden-Powell, was relieved. The Siege of Mafikeng commenced on 14 October 1899 and lasted for 217 days until 17 May 1900. The town became somewhat of an icon at the time. During this time Sol Plaatje wrote his literary masterpiece "The Boer War Diary of Sol T Plaatje: an African at Mafikeng".

Roberts captured Johannesburg on May 31 and Pretoria, the capital of the South African Republic, on June 5. Upon these defeats, President Kruger fled to Europe, and Roberts, believing the war to be won, returned to England in January 1901.

4.3 Notable Archaeological and heritage Sites around the Doornhoek Area.

4.3.1 The Kaditshwene Cultural Landscape National Heritage Site

Kaditshwene / Gaditshwene (Tshwenyane Hills), approximately 20km north-east of Zeerust is the largest Iron Age stone-built city in South Africa. In 1820 this city was larger than Cape Town at that time. It was the manufacturing, trading and cultural capital of the Bahurutshe from before 1600 to 1823. Kaditshwene is historically considered a capital of the Bahurutshe nation and the largest Batswana settlement in Southern Africa with a population of 16,000 to 20,000, around the early 1800's. The large populations of the capital were grouped into three settlement zones, namely a central division, an upper or right-hand division, and a lower or left-hand division. The core of the central division, known as the kgosing (the chief or king's place), contained the chief or king's ward, which was located next to or around the main cattle enclosure and the central court (kgotla). Each ward contained a number of family units, whose members often shared a common line of descent and who were placed under the leadership of a headman or lesser chief. The stonewalled city of Kaditshwene was abandoned in the 1820's when its peace-loving inhabitants proved no match for the aggression of the Sotho.

John Campbell, a member of the London Missionary Society visited Kaditshwene in 1820 and left a detailed record of his visit. "Kurreechane" was Campbell's rendering of the name Kaditshwene, the principal town of the "Marootzee" tribe. On his visit to Kaditshwene in August 1821 the Wesleyan-Methodist missionary, Stephen Kay, described the Hurutshe capital as most probably the largest town he had encountered in the South African interior on his journey from Cape Town. Kaditshwene presents physical remnants of an ancient civilization renowned for the smelting and mining of iron and copper. Oral testimonies tell of the thriving Iron Age economy was based on the indigenous technique and technology of smelting of Iron and mining of Copper. In this regard, the Bahurutshe were famed for their exceptional skill as miners and smelters of iron and copper. There are visible traces of iron melting furnaces and manufactured implements.

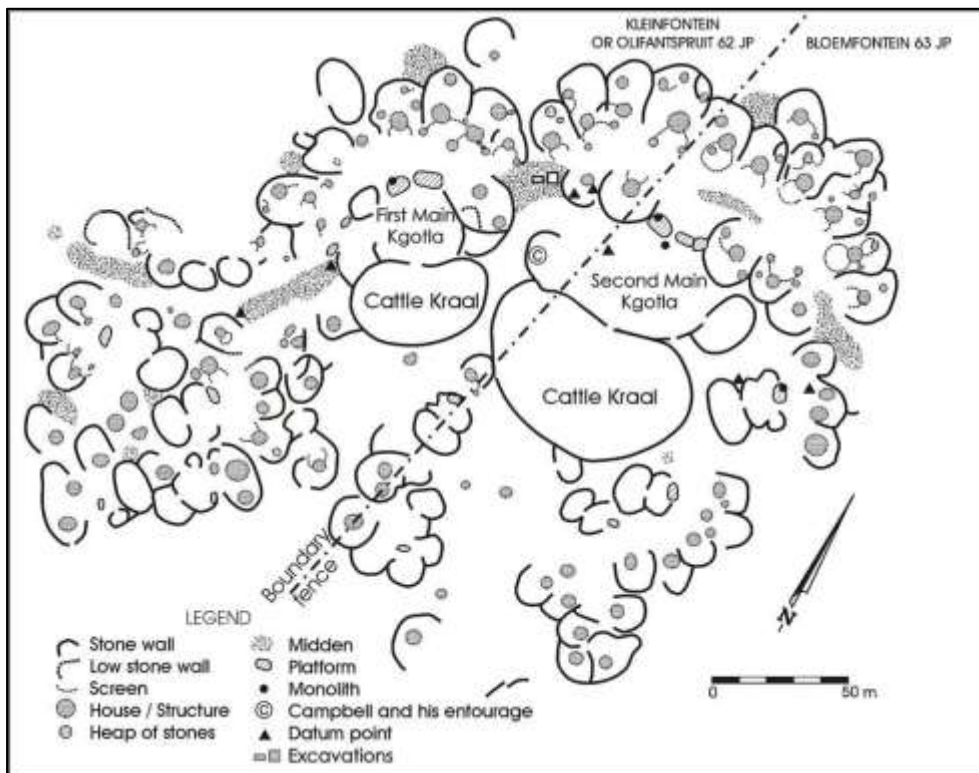


Figure 4-3: Site plan of the central ward in the kgosing (chief's division) of Kaditshwene.).

Other strong elements of the sophisticated indigenous building techniques are evident in the built environment such as the ruins of stone walls and circular dwellings of Kaditshwene. The indigenous knowledge system associated with the infrastructural developments of Kaditshwene underpins the historical achievements and contribution of the Bahurutse of Zeerust to the socio-economic development of South Africa. The Kaditshwene Cultural Landscape was declared a National Heritage Site in 2011 by the South African Heritage Resources Agency in terms of section 27(5) of the National Heritage Resources Act, 25 of 1999.

4.3.2 Schietkraal Iron Age Smelting Site

Iron Age metallurgy and smelting sites are frequently found in this area and across the Botswana border at Ramoutsa near Gaborone (Ellenberger 1936). More specifically, some of these sites have been excavated at Buispoort north-west of Zeerust, at Modderfontein east of Zeerust and at Schietkraal. The furnaces can be related to the Kgatla, the Hurutshe, the Rolong, the Lete and the Ngwaketse - all Tswana-Sotho peoples who are famous for their knowledge of metallurgy and who have lived in the Zeerust area for centuries. Campbell (1822), one of the first European travellers in these regions, saw and sketched a smelting furnace at Kaditshwene, a large Hurutshe settlement located north-east of Zeerust.

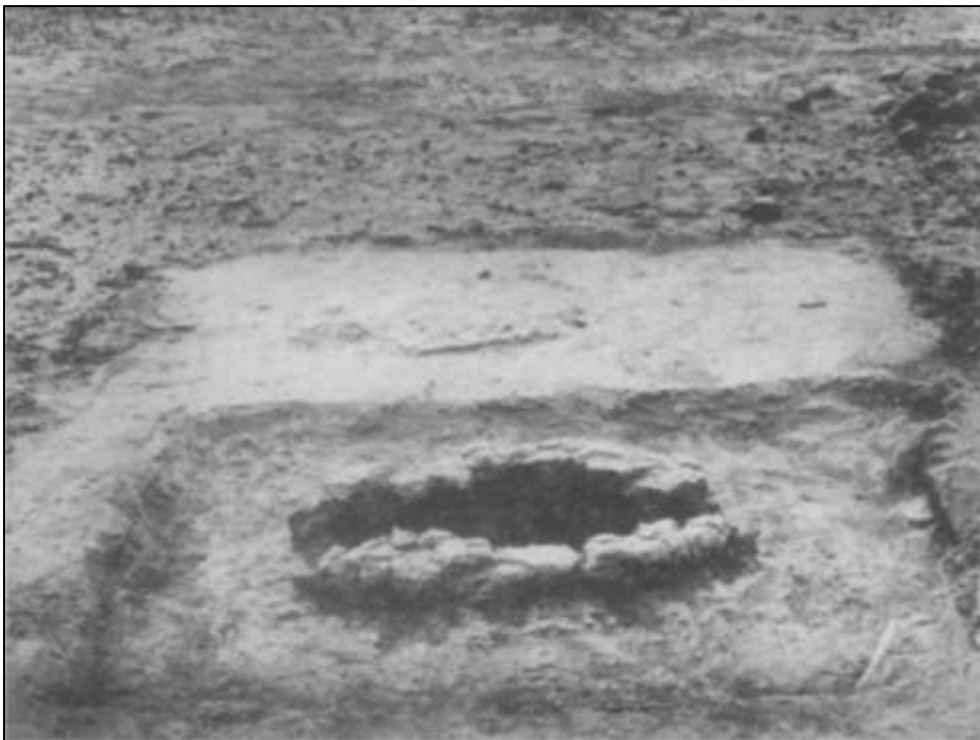


Figure 4-4: Schietkraal smeltings site iron furnace.

At the Iron Age smelting site of Schietkraal 246, approximately 20 km east of Zeerust, five iron smelting furnaces, almost completely buried beneath the surface, were found and two were excavated. In and around the furnaces smelting slag, tuyere fragments, pieces of iron and potsherds were found. It appears that the furnaces were built in the Later Iron Age, between the 16th and 19th centuries A.D. The Schietkraal site presents a sound representation of Iron Age smelting in the area where furnaces are grouped in larger units. This could be attributed to a number of reasons. It would have been more economical to work several furnaces at the same time, especially if a larger production for military or trade purposes was required. Also, the flow of production would have been improved when firing cooling or

smelting/re-smelting cycles were worked in a group of furnaces. The furnaces at the Schietkraal site belong to a distinct type which could be called "Buispoort Type" after the prototype described by Van Hoepen & Hoffman (1935). Relative dating, a study of the associated pottery, the settlement types and recorded local oral tradition placed the Schietkraal site in the end phase of the Later Iron Age (16th century A.D. - 19th century A.D.).

4.3.3 Buispoort & Rietfontein Iron Age Sites

Two significant Iron Age sites of the early Moloko tradition were documented at Rietfontein north of Zeerust, and Buispoort north-west of the town. The Iron Age site at Rietfontein has been dated to AD 1590 + 50 and the site provided important data on the origins of the Moloko ceramic tradition. The name "Buispoort" refers to a site north-west of Zeerust, which was first described in 1935 by E.C.N. van Hoepen and A.C. Hoffman from the National Museum in Bloemfontein.

4.3.4 Magozastad – Early and Late Moloko (Iron Age)

The Magozastad archaeological settlement is situated approximately 30 kilometres to the east of Zeerust on the farm Magozastad. The site is characterised by a cluster of huts and grain bin platforms around a central cattle kraal and an absence of stone walling (Boeyens 2003). This absence indicates an association with the Earlier Moloko tradition that is characterised by the absence of stone walling and associated pottery styles of the Moloko sequence (see previous sections)

4.3.5 Mosega Battle Historical Site

The Mosega Monument commemorates the 1837 Battle of Mosega, which occurred when Boer leaders Andries Potgieter and Gerrit Maritz confronted Mzilikazi's Matabele at their headquarters, 15 kilometres from the present Zeerust. Mosega was one of the large settlements of the Ndebele tribe of King Mzilikazi (1790 - 1868). At the Battle of Vegkop (2 October 1836) the Matabele took 6000 head of cattle plus 40000 sheep from the Boers. On January 2nd 1837, a small commando of 107 men set out from Blesberg, travelling past the site of the present Pretoria and then west to within range of Mosega, the complex of kraals that formed the Matabele capital, a total distance of some 320 miles. At dawn on the morning of January 17th 1837, the Voortrekkers set upon the first of the kraals with total surprise, killing men, women and children. Herding survivors before them and torching the kraals, the Voortrekkers had laid waste to Mzilikazi's capital Mosega by the end of the morning leaving not a single warrior alive. No Voortrekkers were killed. Mzilikazi was away at the time at Kapain. However, the great military kraal at Kapain was still intact and the horses were too tired to make the extra 60 miles. The Voortrekkers, several thousand head of cattle and a party of American missionaries (that had elected to join them rather than stay) retired rapidly back across the Vaal River before the Matabele could regroup.

4.3.6 The Siege of Mafikeng and other Anglo Boer War Sites

The Siege of Mafeking was the most famous British action in the Second Boer War. It took place at the town of Mafeking (now Mahikeng) in South Africa over a period of 217 days, from October 1899 to May 1900, and turned Robert Baden-Powell, who went on to found the Scouting Movement, into a national hero. The Relief of Mafeking (the lifting of the siege) was a decisive victory for the British and a crushing defeat for the Boers. Kanonkoppie, south east of Mahikeng was one of the important British forts during the siege of Mafeking. Shortly before the outbreak of the Second Boer War in 1899, Lord Wolseley, Commander-in-Chief of the British Army, who had failed to persuade the British government to send troops to the region, instead sent Colonel (later Lord) Baden-Powell, accompanied by a handful of officers, to the Cape Colony to raise two Regiments of Mounted Rifles from Rhodesia. Their aims were to resist the expected Boer invasion of the Natal Colony (now KwaZulu-Natal Province), draw the Boers away from the

coasts to facilitate the landing of British troops, and, through a demonstrable British presence, deter the local people from siding with the Boers. Like the British government, the local politicians feared that increased military activity might provoke a Boer attack, so Baden-Powell decided to obtain many of his own stores, organise his own transport and recruit in secret. With barely trained forces and aware of the Boers' greatly superior numbers, commando tactics and the failure of the earlier Jameson Raid, Baden-Powell decided that the best way to tie down Boer troops would be through defence rather than attack. Consequently he chose to hold the town of Mafeking due to its location - both near the border and on the railway between Bulawayo and Kimberley - and because of its status as a local administrative centre. As well, the town had good stocks of food and other necessities.

Work to build defences around the 6-mile (10 km) perimeter of Mafeking started on 19 September 1899; the town would eventually be equipped with an extensive network of trenches and gun emplacements. President Kruger of the independent Boer South African Republic declared war on 12 October 1899. Under the orders of General Cronje the Mafeking railway and telegraph lines were cut the same day, and the town began to be besieged from 13 October. Mafeking was first shelled on 16 October after Baden-Powell ignored Cronje's 9 o'clock deadline to surrender. Although outnumbered by over 8,000 Boer troops, the garrison withstood the siege for 217 days, defying the predictions of the politicians on both sides. The siege was finally lifted on 17 May 1900, when British forces commanded by Colonel B T Mahon of the army of Lord Roberts relieved the town after fighting their way in. Among the relief forces was one of Baden-Powell's brothers, Major Baden Fletcher Smyth Baden-Powell. During the Siege of Mafeking, a refugee camp was established to house some of the Boer families. After the siege, the camp was relocated further west along the Molopo River. When the British started their "scorched earth policy" (systematic burning of Boer farms and possible hiding places), Boer women and children were forcibly moved into the camp. This became the first concentration camp in South Africa. Conditions in the camp were atrocious. In April 1901, Emily Hobhouse visited the camp and after her report, the camp superintendent was dismissed on account of gross negligence. There are two concentration camp cemeteries near the town of Mafeking. The wives and children of Boer soldiers who refused to surrender to the British were buried in Mazezeru. The cemetery in Magogoe became the last resting place of the wives and children of the men who had surrendered. Remains of African woman and children have also been found in both these cemeteries.

4.3.7 Anglo Boer War Burial Sites

A large number of war graves and cemeteries dating to the Anglo-Boer conflict occur in the landscape around Zeerust and Mahikeng. In most cases, these burials are randomly scattered in the veld and often occurring where soldiers fell during battle. Anglo-Boer war graves have been identified on the farms Buffelshoek, Kwaggafontein and Klaarstroom, amongst others.

4.3.8 Burial Sites / Human Remains

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).



Figure 4-5: Map detailing the occurrence of selected heritage sites in the Marico and surroundings.

5 RESULTS: ARCHAEOLOGICAL SURVEY

The history and archaeology of the larger Lowveld area is relatively well known and the landscape around Zeerust is primarily well known for the occurrence of Iron Age farmer and Historical Period occurrences. The proposed Doornhoek Fluorspar Mine Project area is situated in environments which are mostly pristine with occasional disturbance as a result of livestock farming and artisanal mining. A number of heritage occurrences were noted during the site survey for the current footprint. These occurrences were uniquely coded **EXIGO-DFM-IAxx** (Exigo Doornhoek Fluorspar Mine Iron Age xx) and **EXIGO-DFM-FTxx** (Exigo Doornhoek Fluorspar Mine Feature xx).

5.1 The Stone Age

Material from the earlier, middle and later Stone Age occur widely across the North West Province. At these locations, Stone Age material generally occurs along major drainage lines and at water sources as well as at rock shelters and outcrops. Following this pattern, sites of all periods of the Stone Age (earlier, middle, and later) are likely to occur along drainage lines and at sources of water in the larger Doornhoek Fluorspar Project area. However, no Stone Age occurrences were documented during the site survey.

5.2 The Iron Age Farmer Period

Even though Early Iron Age sites occur in lower densities in this part of the North West Province, such sites generally occur along drainage lines and near water sources. A large number of later Iron Age (Farmer period) sites are scattered across the Marico landscape. These sites are typically characterised by elaborate and extensive stone walls covering large surface areas. Similarly, 3 stone walled sites were identified in the Doornhoek Fluorspar Project area.

- **Site EXIGO-DFM-IA01: Stone Walled Site**
 Northern Periphery S25.711870° E26.200192°
 Eastern Periphery S25.712155° E26.202182°
 Southern Periphery S25.713715° E26.200114°
 Western Periphery S25.712795° E26.199177°

A large stone walled site, consisting out of sections of collapsed stone walling arranged in large scalloping circular enclosures is situated on Farm 306JP along the northern edge of the fluorspar resource to be mined. The cluster of stone walls extends for about 150m in all directions with a smaller enclosure approximately 150m south of the main site. The structures display irregular stone building with entrances which are demarcated by monoliths in places. No material culture was found in association with the walling and it is therefore not possible to ascertain an absolute temporality for the structures. However, considering similar sites in the surrounding landscape and the settlement history of Sotho-Tswana groups, the site probably dates to the late 18th early 19th century and might be regarded as part of the Kaditswene Cultural Landscape. As such, the site is of scientific value in terms of its regional representation in the Iron Age farmer period landscape of the area and it is rated as of medium significance. The site is located in areas demarcated for mining and impact on the site could be anticipated.



Figure 5-1: Aerial image indicating the location and extent of Site EXIGO-DFM -IA01 (site in white, conservation buffer in red).



Figure 5-2: Rough stone walling at Site EXIGO-DFM -IA01.



Figure 5-3: Rough stone walling at Site EXIGO-DFM -IA01.



Figure 5-4: Rough stone walling at Site EXIGO-DFM -IA01.

- **Site EXIGO-DFM-IA02: Stone Walled Site with Traces of Iron Smelting**

Northern Periphery S25.718297° E26.194686°

Eastern Periphery S25.718785° E26.195215°

Southern Periphery S25.719250° E26.194659°

Western Periphery S25.718702° E26.194197°

A smaller circular stone walled site occurs on Farm 306 west of the fluorspar resource to be mined. The main stone enclosure measures approximately 80m x 75m and a number of smaller internal walls forms smaller enclosures. The stone walling and enclosures display irregular stone building with flatter stones and a number of defined entrances are demarcated with monoliths. At this site, traces of metal smelting in the form of smelting residues such as slag and bloom were discovered. Slag refers to melted impurities that were constituent parts of the metal ore, a common element being silica. No further diagnostic material culture was found in association with the walling and it is therefore not possible to ascertain an absolute temporality for the structures. However, considering similar sites in the surrounding landscape and the settlement history of Sotho-Tswana groups, the site probably dates to the late 18th early 19th century and might be regarded as part of the Kaditswene Cultural Landscape. As such, the site is of scientific value in terms of its regional representation in the Iron Age farmer period landscape of the area and it is rated as of medium significance. The site is located in close proximity of areas demarcated for mining and impact on the site could occur.



Figure 5-5: Aerial image indicating the location and extent of Site EXIGO-DFM-IA02 (site in white, conservation buffer in red).



Figure 5-6: Stone walling at Site EXIGO-DFM-IA02.



Figure 5-7: Stone walling at Site EXIGO-DFM-IA02. Note demarcated entrance.



Figure 5-8: Metal smelting residue (slag) from Site EXIGO-DFM-IA02.

- **Site EXIGO-DFM-IA03**

Northern Periphery S25.714503° E26.211933°

Eastern Periphery S25.715133° E26.212433°

Southern Periphery S25.715611° E26.212014°

Western Periphery S25.714964° E26.211378°

Another smaller circular stone walled site occurs along the eastern border of Farm 306 directly adjacent to the eastern edge of the fluorspar resource to be mined. The main stone enclosure measures approximately 40m x 35m with a number of crude stone cairns scattered to the west of the site. The stone walling and enclosures display irregular stone building with flatter stones and a number of defined entrances are demarcated with monoliths. Traces of metal smelting in the form of smelting residues such as slag and bloom also occur at this site. No further diagnostic material culture was found in association with the walling and it is therefore not possible to ascertain an absolute temporality for the structures. However, considering similar sites in the surrounding landscape and the settlement history of Sotho-Tswana groups, the site probably dates to the late 18th early 19th century and might be regarded as part of the Kaditswene Cultural Landscape. As such, the site is of scientific value in terms of its regional representation in the Iron Age farmer period landscape of the area and it is rated as of medium significance. The site is located in close proximity of areas demarcated for mining and impact on the site could occur.

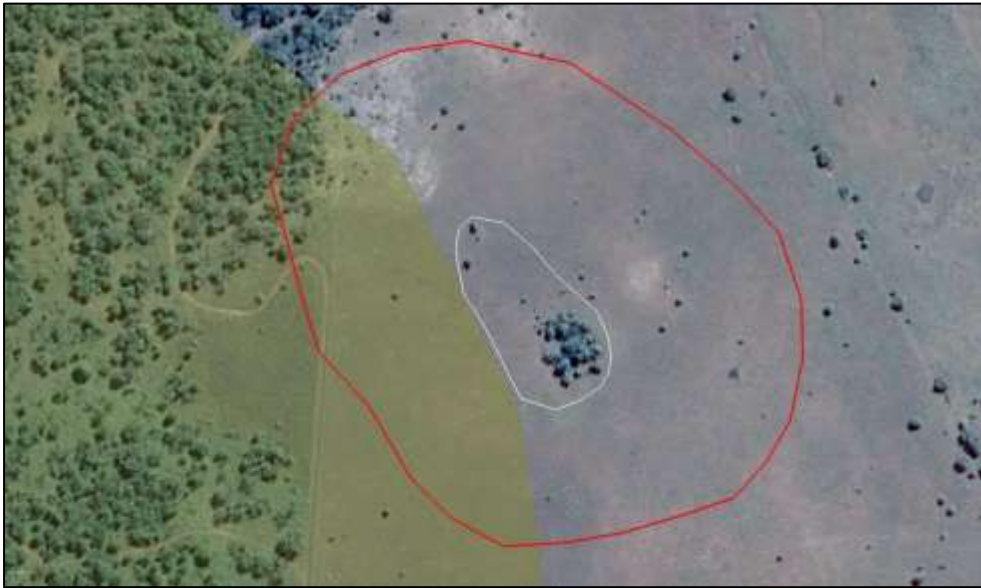


Figure 5-9: Aerial image indicating the location and extent of Site EXIGO-DFM-IA03 (site in white, conservation buffer in red).



Figure 5-10: Collapsed stone walling at Site EXIGO-DFM-IA03.



Figure 5-11: Scattered stone structures and cairns at Site EXIGO-DFM-IA03.



Figure 5-12: Small fragments of metal smelting residue (slag) from Site EXIGO-DFM-IA03.

5.3 Historical / Colonial Period and Recent Features

During the 18th and 19th centuries, the area around the towns of Mafikeng and Zeerust provided a passage for traders, explorers and adventurers moving across the North West Frontier into present-day Botswana. The town of Zeerust was established in 1867 and at the time, farms appeared around the town and related infrastructure emerged. Farmsteads and buildings were constructed on farms in the area, most of which were unfortunately destroyed during the terminal phases of the Anglo Boer War during the so-called “Scorched Earth” Campaign. Still, most of the farms in the Doornhoek Fluorspar Project Area were proclaimed in the 19th century and beginning of the 20th century and farmsteads on these farms that might remain, probably date to the same period. No Historical / Colonial Period occurrences were observed in any of the survey areas. In terms of the built environment, the area has no significance, as there are no old buildings, structures, or features, old equipment, public memorial or monuments in the footprint areas.

- **Site EXIGO-DFM-FT01: Unidentified Stone Features**
S25.731194° E26.213590°

A number of stone heaps of unidentified context and function occur along the eastern border of Farm 306JP and within fluorspar resource areas to be mined. The heaps occur in the vicinity of farmlands and the stones might have been removed and collected to clear areas for agriculture. Since no diagnostic material culture was found in association with the features, it is not possible to ascertain a temporality for the structures but it might be assumed that the heaps are not of heritage value. The features are located in areas demarcated for mining and impact on the sites will likely occur.



Figure 5-13: Unidentified stone structures and cairns at Site EXIGO-DFM-FT01.



Figure 5-14: Unidentified stone structures and cairns at Site EXIGO-DFM-FT01.

- **Site EXIGO-DFM-FT02**
S25.735941° E26.214893°
- **Site EXIGO-DFM-FT02**
S25.744039° E26.219699°

Signs of artisanal fluorspar mining occur along the south-eastern border of Farm 306JP within fluorspar resource areas to be mined. A number of small excavation pits, trenches and waste heaps occur scattered across the landscape. According to local sources the informal mining activities was in operation for much of the 20th century. No diagnostic material culture or related structures were found in association with the features and it is not possible to ascertain an absolute temporality for the features but it might be assumed that the mining sites are not of heritage value. The features are located in areas demarcated for mining and impact on the sites will likely occur.



Figure 5-15: A deep trench for fluorspar mining.



Figure 5-16: Stone heaps around artisanal fluorspar mining trenches.



Figure 5-17: An small open quarry for fluorspar mining.



Figure 5-18: Small trenches and exposed fluorspar deposits.

- **Site EXIGO-DFM-FT04**
S25.724343° E26.124964°

The remains of a large opencast fluorspar mine pit occur on the farm Rhenosterfontein 304JP adjacent to fluorspar resources areas to be mined on this property. No mining equipment was observed at the site. The diggings and excavations were in operation for much of the 20th century. No diagnostic material culture or related structures were found in association with the feature and it is not possible to ascertain an absolute temporality for the pit but it might be assumed that the mining site is of limited heritage value. The feature is located adjacent to areas demarcated for mining and impact on the site might occur.



Figure 5-19: Remains of diggings at a fluorspar mine on the farm Rhenosterfontein.

5.4 Graves

No grave or human burials were observed in any of the survey areas. In the rural areas of the North West Province graves and cemeteries often occur within settlements or around homesteads but they are also randomly scattered around archaeological and historical settlements. The probability of additional and informal human burials encountered during development should thus not be excluded. 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.

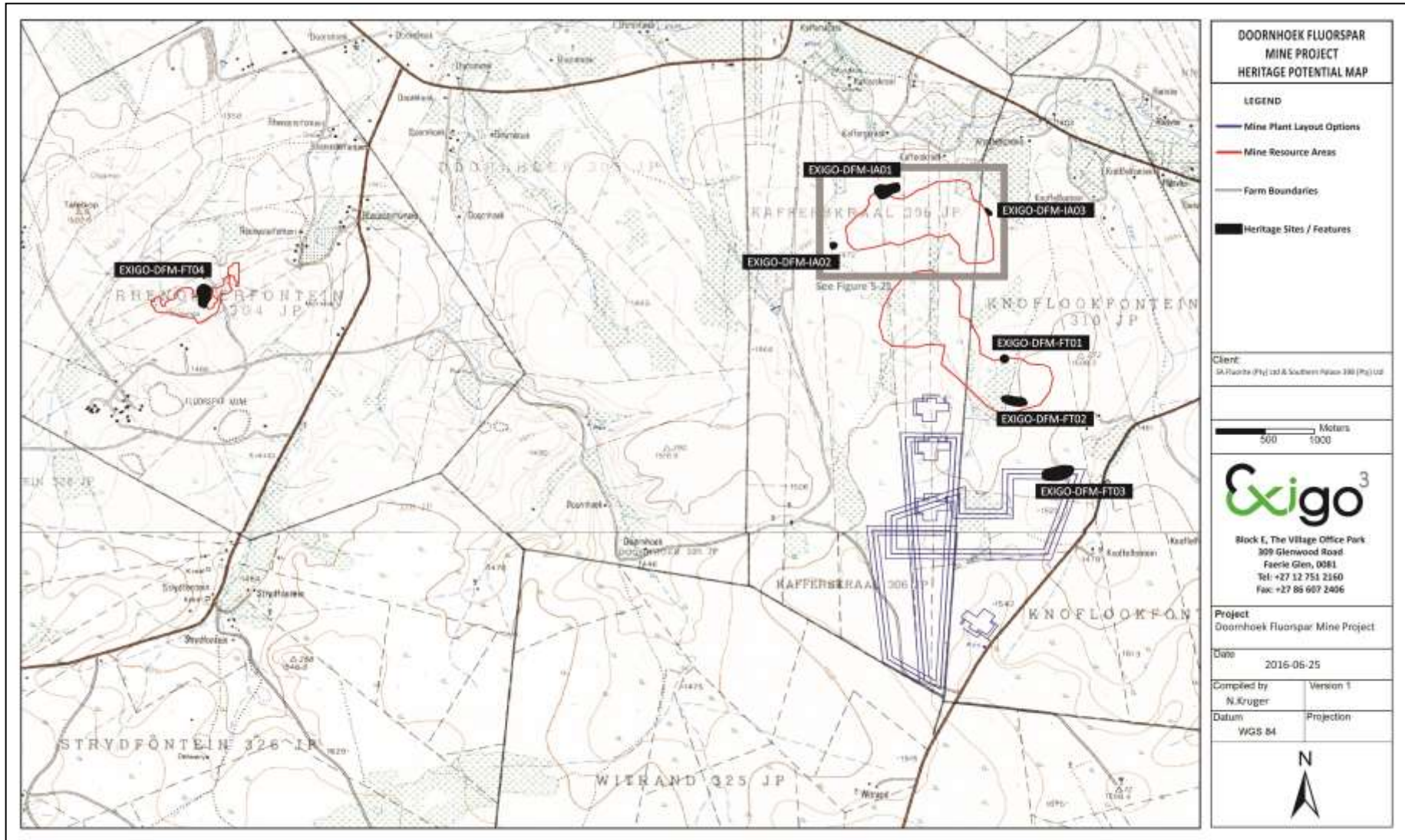


Figure 5-20: Topographic map indicating the location of the heritage site discussed in the text.



Figure 5-21: Aerial map indicating the location of the heritage sites of significance as well as conservation buffers discussed in the text.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings²

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 the Addendum.

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, 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).

A heritage receptor was found in the project area and potential impact to heritage resources is foreseen.

The following table summarizes impacts to the **low** significance features (**Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04**) located within or close to the footprint of the proposed Doornhoek Fluorspar Mine Project.

NATURE OF IMPACT: Impact could involve displacement or destruction of features in the study area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Minor	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	Low	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible

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

IRREPLACEABLE LOSS OF RESOURCES?	Yes	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: Site monitoring by ECO.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

The following table summarizes impacts to the **medium** significance features (**Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03**) located in close proximity of the footprint of the proposed Doornhoek Fluorspar Mine Project.

NATURE OF IMPACT: Impacts could involve displacement or destruction of Iron Age material in the Singelele Eco-Estate Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major	Minor
PROBABILITY	Probable	Very improbable
SIGNIFICANCE	High	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	No	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: Avoidance, Phase 2 Specialist Analysis and Sampling, monitoring by ECO.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

The following table summarizes impacts to the **medium** significance features (**Site EXIGO-DFM-IA01**) located within the footprint of the proposed Doornhoek Fluorspar Mine Project.

NATURE OF IMPACT: Impacts could involve displacement or destruction of Iron Age material in the Singelele Eco-Estate Project area.		
	Without mitigation	With mitigation
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGNITUDE	Major	Minor
PROBABILITY	Definite	Very improbable
SIGNIFICANCE	High	Low

STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	No	No
CAN IMPACTS BE MITIGATED?	Yes	
MITIGATION: Avoidance, Phase 2 Specialist Analysis and Sampling, monitoring by ECO.		
CUMULATIVE IMPACTS: No cumulative impact is anticipated.		
RESIDUAL IMPACTS: n/a		

6.1.3 Impact Assessment Matrix

Nr	Activity	Impact	Without or With Mitigation	Nature (Negative or Positive Impact)	Probability		Duration		Scale		Magnitude/Severity		Significance		Mitigation Measures	Mitigation Effect
					Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Score	Magnitude		
Planning Phase																
1	Planning	Site EXIGO-DFM-IA01 (medium significance)	WOM	Negative	Improbable	4	Short term	4	Local	1	Low	2	28	Low	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Site Monitoring	Can be avoided, managed or mitigated
2	Planning	Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03 (medium significance)	WOM	Negative	Improbable	1	Short term	1	Local	1	Medium	6	8	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Site Monitoring	Can be avoided, managed or mitigated
3	Planning	Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04 (low significance)	WOM	Negative	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Local	1	High	8	10	Negligible	Site Monitoring	Can be avoided, managed or mitigated
Construction Phase																
5	Construction / Clearing	Site EXIGO-DFM-IA01 (medium significance)	WOM	Negative	Definite	5	Permanent	4	Site	4	High	5	65	High	Avoidance, Phase 2 Study and Sampling	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Avoidance, Phase 2 Study and Sampling	Can be avoided, managed or mitigated
6	Construction / Clearing	Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03 (medium significance)	WOM	Negative	Highly Probable	4	Permanent	5	Site	2	Medium	6	52	Moderate	Avoidance, Phase 2 Study and Sampling	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Avoidance, Phase 2 Study and Sampling	Can be avoided, managed or mitigated
7	Construction / Clearing	Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04 (low significance)	WOM	Negative	Definite	5	Short term	1	Local	1	Low	2	20	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Local	1	Low	2	4	Negligible	Site Monitoring	Can be avoided, managed or mitigated
Operational Phase																
9	Mining / Processing	Site EXIGO-DFM-IA01 (medium significance)	WOM	Negative	Improbable	1	Medium term	3	Site	2	High	8	13	Negligible	Site Monitoring	Can be avoided, managed or mitigated

			WM	Positive	Improbable	1	Medium term	3	Site	2	Low	2	7	Negligible	Site Monitoring	Can be avoided, managed or mitigated
10	Mining / Processing	Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03 (medium significance)	WOM	Negative	Improbable	1	Medium term	3	Site	2	Medium	6	11	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Medium term	3	Site	2	Low	2	7	Negligible	Site Monitoring	Can be avoided, managed or mitigated
11	Mining / Processing	Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04 (low significance)	WOM	Negative	Improbable	1	Medium term	3	Site	2	Low	2	7	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Medium term	3	Site	2	Low	2	7	Negligible	Site Monitoring	Can be avoided, managed or mitigated
Closure and Decommissioning Phase																
13	Decommissioning	Site EXIGO-DFM-IA01 (medium significance)	WOM	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
14	Decommissioning	Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03 (medium significance)	WOM	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
15	Decommissioning	Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04 (low significance)	WOM	Negative	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Short term	1	Site	2	Low	2	5	Negligible	Site Monitoring	Can be avoided, managed or mitigated
Post-Closure Phase																
17	Post-Closure	Site EXIGO-DFM-IA01 (medium significance)	WOM	Negative	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated
18	Post-Closure	Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03 (medium significance)	WOM	Negative	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated
19	Post-Closure	Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04 (low significance)	WOM	Negative	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated
			WM	Positive	Improbable	1	Permanent	5	Site	2	Low	2	9	Negligible	Site Monitoring	Can be avoided, managed or mitigated

6.1.4 Discussion: Evaluation of Results and Impacts

Previous studies conducted in the eastern Lowveld area suggest a rich and diverse archaeological landscape and cognisance should be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines and in pristine areas.

A number of recent period features (**Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04**) occurring within the proposed Doornhoek Fluorspar Mine Project areas is of low heritage significance. The potential impact on the resource is considered to be LOW but this impact rating can be limited to a NEGLIBLE impact by the implementation of mitigation measures (site monitoring) for the sites, if / when required.

Two small Iron Age settlement and Iron Smelting sites (**Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03**) are of significance in terms of its regional representation in the Iron Age farmer period landscape of the Kaditswene Cultural Landscape. The sites are located in close proximity of Doornhoek Fluorspar Mine Project areas and the impact on the sites by the proposed development activities is anticipated to be peripheral where in essence, the impact might result the damage / loss of the occurrences. The potential impact on the resource is considered to be MODERATE but this impact rating can be limited to a NEGLIBLE impact by the implementation of mitigation measures (avoidance, Phase 2 Study and Sampling monitoring, relevant permitting) for the sites, if / when required.

A large Iron Age occupation at **Site EXIGO-DFM-IA01** is of high significance in terms of its regional representation in the Iron Age farmer period landscape of the area. The site is located within Doornhoek Fluorspar Mine Project areas and impact on the site by the proposed development activities is anticipated to be direct where in essence, the impact will result the damage / loss of the occurrences. The site will be also sterilized of any future heritage research opportunities. The potential impact on the resource is considered to be HIGH but this impact rating can be limited to a NEGLIBLE impact by the implementation of mitigation measures (avoidance, Phase 2 Study and Sampling monitoring, relevant permitting) for the sites, if / when required.

Heritage resources of significance occur within and in close proximity of areas proposed for the Doornhoek Fluorspar Mine Project. In the opinion of the author of this Archaeological Impact Assessment Report, the proposed Doornhoek Fluorspar Mine Project on Rhenosterfontein 304JP and Farm 306JP may proceed from a culture resources management perspective, provided that mitigation measures are implemented if and when required.

6.2 Management actions

Recommendations for relevant heritage resources management actions are vital to the conservation of heritage resources. A general guideline for recommended management actions is included in Section 10.4 of the Addendum. The following management measures would be required during implementation of the proposed Doornhoek Fluorspar Mine Project.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of previously undetected heritage receptors.

No specific action in terms of mitigation is required for the low significance features (**Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04**) occurring within the proposed Doornhoek Fluorspar Mine Project. However, the following general procedure is required for the sites:

PROJECT COMPONENT/S	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	
Fixed Mitigation Procedure (required)			
Site Monitoring: Regular examination of trenches and excavations.	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.		

For the significant Iron Age Sites (**Site EXIGO-DFM-IA01 - Site EXIGO-DFM-IA03**) occurring within or in close proximity of the proposed Doornhoek Fluorspar Mine Project the following are required in terms of heritage management and mitigation:

PROJECT COMPONENT/S	All phases of construction and operation.		
POTENTIAL IMPACT	Damage/disturbance to sites and subsurface features and deposits.		
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.		
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	
Preferred Mitigation Procedure			
Avoidance: Implement a heritage conservation buffer of at least 100m around the heritage receptor, where possible redesign infrastructure to avoid the heritage resource and the proposed conservation buffer. Fence all burial places and apply access control.	DEVELOPER QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.	
Alternative Mitigation Procedure (if preferred mitigation procedure is not feasible)			
Phase 2 Study and Sampling: Full Phase 2 Specialist Assessment of sites including mapping, site sampling and possible conservation management and protection measures. Subject to authorisations and relevant permitting from heritage authorities and affected parties.	QUALIFIED HERITAGE SPECIALIST	Prior to the commencement of construction and earth-moving.	
Fixed Mitigation Procedure (required)			
Site Monitoring: Regular examination of trenches and	ECO	Monitor as	

excavations.		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

The larger landscape of the North West Province is rich in pre-historical and historical remnants and this rings true for the Zeerust area and surrounds. The following recommendations are made based on general observations in the proposed Doornhoek Fluorspar Mine Project area:

- A Palaeontological Impact Assessment is recommended where bedrock is to be impacted and, should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.
- A number of recent period features (**Site EXIGO-DFM-FT01 - Site EXIGO-DFM-FT04**) occurring within the proposed Doornhoek Fluorspar Mine Project areas is of low heritage significance. No further action is required in terms of mitigation of the sites and occurrences.
- Two small Iron Age settlement and Iron Smelting sites (**Site EXIGO-DFM-IA02 & Site EXIGO-DFM-IA03**) are of significance in terms of its regional representation in the Iron Age farmer period landscape of the Kaditswene Cultural Landscape. The sites are located in close proximity of Doornhoek Fluorspar Mine Project areas and it is recommended that a careful watching brief monitoring process be implemented whereby an informed ECO inspect the construction sites on regular basis in order to monitor possible impact on existing and previously undetected heritage resources. A heritage conservation buffer of at least 100m around the heritage receptor should be implemented and maintained. Should the sites be impacted on by development in any way it should be adequately documented and sampled by means of a Phase 2 Specialist study and the necessary permits should be obtained from the relevant Heritage Resources Authorities.
- A large Iron Age occupation at **Site EXIGO-DFM-IA01** is of high significance in terms of its regional representation in the Iron Age farmer period landscape of the area. The site is located within Doornhoek Fluorspar Mine Project areas and it is primarily recommended that proposed development be planned as to avoid impact on the heritage resource, and a heritage conservation buffer of at least 100m around the heritage receptor be implemented. If this measure proves unachievable it is recommended that the historical fabric of the sites be conserved by means of a Phase 2 Specialist study (mapping, site sampling and possible conservation management and protection) and the necessary permits should be obtained from the relevant Heritage Resources Authorities.
- 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 is essential that cognisance be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites. It should be stated that it is likely that further undetected archaeological remains might occur elsewhere in the Study Area 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 the larger landscape 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 Doornhoek Fluorspar Mine Project area. The larger heritage horizon encompasses rich and diverse archaeological landscapes and cognizance 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 site 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: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

10.1 Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these. The following matrix is used for assessing the significance of each identified site/feature.

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			

10.2 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. sitespecific, 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.

10.3 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

HERITAGE CONTEXT	TYPE OF DEVELOPMENT			
	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
<p>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</p> <p>Context 2: Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.</p> <p>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</p> <p>Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.</p>	<p>Category A: Minimal intensity development</p> <ul style="list-style-type: none"> - 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. <p>Category B: Low-key intensity development</p> <ul style="list-style-type: none"> - 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%). <p>Category C: Moderate intensity development</p> <ul style="list-style-type: none"> - Rezoning of a site between 5000m2-10 000m2.

	<ul style="list-style-type: none"> - 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%) <p>Category D: High intensity development</p> <ul style="list-style-type: none"> - 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%)
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10.4 Management and Mitigation Actions

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

<p>No further action / Monitoring</p> <p>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.</p> <p>Avoidance</p> <p>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.</p> <p>Mitigation</p> <p>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.</p> <p>Compensation</p> <p>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.</p> <p>Rehabilitation</p> <p>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:</p> <ul style="list-style-type: none"> - 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. <p>Enhancement</p> <p>Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should, however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored</p>
