

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999))

FOR THE PROPOSED VYGENHOEK MINE, MPUMALANGA PROVINCE

Type of development:

Mining

Client:

Environmental Management Assistance (Pty) Ltd

Environmental Impact Practitioner info:

Anandi Alers

E – mail:

anandi.alers@emassistance.co.za

Developer:

Nomamix (Pty) Ltd



HCAC - Heritage Consultants

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco@heritageconsultants.co.za

Report Author:

Mr. J. van der Walt

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APPROVAL PAGE

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Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Environmental Management Assistance (Pty) Ltd

	Name	Qualifications and Certifications	Date
Archaeologist	Jaco van der Walt	MA Archaeology ASAPA #159 APHP #114	December 2020
Archaeologist	Ruan van der Merwe	BA Archaeology	December 2020

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11 February 2021	2040	Assessing alternative layout

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(l) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIR report
(q) Any other information requested by the competent authority	Section 13

Executive Summary


Nomamix (Pty) Ltd, appointed Environmental Management Assistance (Pty) Ltd (EMA) as the Environmental Assessment Practitioner (EAP) to conduct the Scoping and EIA process in order to obtain an Environmental Authorisation (EA) for the proposed Vygenhoek Mine located approximately 28 km north east of Roossenekal and 30 km west of Lydenburg in the Mpumalanga Province. HCAC was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey, key findings of the assessment include:

- The study area was previously assessed by Pistorius (2006) and later by Du Piesanie and Higgitt (2012). Both studies highlighted the heritage significance of the area;
- During the current assessment, selected sites from previous surveys was revisited and in addition several new sites were recorded and the combined surveys recorded in excess of 50 heritage features for the study area (Figure 8-1 & Table 7);
- Sites recorded range from the Middle Stone Age (MSA) to the Iron Age and historical/recent periods, highlighting the cultural significance of the area;
- The Choma settlement with associated intangible features occur within the study area and is of social and cultural significance;
- Numerous burial sites were recorded and undoubtedly more can be expected and poses the biggest risk to the proposed project. Graves should ideally be preserved *in-situ* or alternatively relocated according to existing legislation;
- In terms of the palaeontological component, the area is indicated as of insignificant to low palaeontological sensitivity on SAHRIS and no further studies are required in this regard;
- The layout assessed during the field survey will have a medium to high impact on heritage resources and will require extensive mitigation. Because of environmental and cultural sensitivities an alternative layout was proposed that results in a much lower impact to heritage resources. From a heritage perspective the alternative is acceptable if the recommendations made in this report are adhered to based on approval from SAHRA.

Recommendations:

- Social consultation with the Choma representatives is required to adequately record intangible and tangible resources that could be impacted on by the proposed project;
- The Choma Village will be preserved based on the preferred alternative layout, however it is recommended that consultations with the Choma representatives should determine conservation thresholds and to ensure that indirect and secondary impacts are acceptable;
- With the preferred alternative, the Mine Plan was amended as far as feasible to avoid damage to the recorded heritage resources. Where this is not possible phase 2 mitigation is recommended based on approval from SAHRA;
- The aerial extent of recorded heritage resources must be mapped in relation to the mine layout to finalise mitigation measures (sites that will require monitoring or phase 2 mitigation);
- Implementation of a site development plan;
- Implementation of a monitoring programme;
- A heritage specialist should assess any material change to the conceptual layout plan and a heritage walkdown of the final layout must be conducted prior to construction. Note that time should be allowed for mitigation if additional sites are identified during the walk down;
- A possible grave site was identified during the mapping process and it should be confirmed whether the site is a grave, if so possible micro adjustment of the haul road to retain site *in-situ* with an adequate buffer zone and safe access for family members is recommended;
- Implementation of a chance find procedure for the project.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, 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 form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	09/12/2020

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference:

HCAC was appointed to conduct a Heritage Impact Assessment for the proposed Vygenhoek Platinum Mine located approximately 28 km north east of Roossenekal and 30 km west of Lydenburg in the Mpumalanga Province (Figure 1-1 to 1-4). The report forms part of the Environmental Impact Assessment (EIA) and Environmental Management Programme Report (EMPr) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey Stone Age, Iron Age, Historical/recent settlements, and Burial Sites were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

1.2 Project Description

The project comprises a mine application as described in Table 2 and 3.

Table 2: Project Description

Farm and portions	The Farm Vygenhoek 10 JT
Magisterial District	Thaba Chewu Municipality
Central co-ordinate of the development	25° 2'34.86"S 30° 9'13.53"E

Table 3: Infrastructure and project activities

Type of development	Mine
Size of development	Linear developments – Approximately 6,675 km Development footprint – Approximately 68 hectares
Project Components	<p>The project comprises opencast mining that will produce iron ore that will be sold to one of the existing processing plants. The Vygenhoek project footprint is small and it will not support the construction of a processing plant however it will require some support facilities and infrastructure in order to operate. The other associated infrastructure requirements are:</p> <ul style="list-style-type: none"> • waste management: temporary handling and storage of general and hazardous waste, on-site change houses/ablution facilities with septic tanks; • surface water management: water supply dams, mine residue facility return water dams, pollution control dams, clean and dirty storm water controls, river crossings; • storage and handling of hazardous substances: fuel, lubricants, various process input chemicals, raw material stockpiles/bunkers, gas, burning oils, explosives; • security and access control; • lay down and storage yard areas; • workshops and wash bays; • offices; • contractor camps; • medical station and; • Diesel Generator

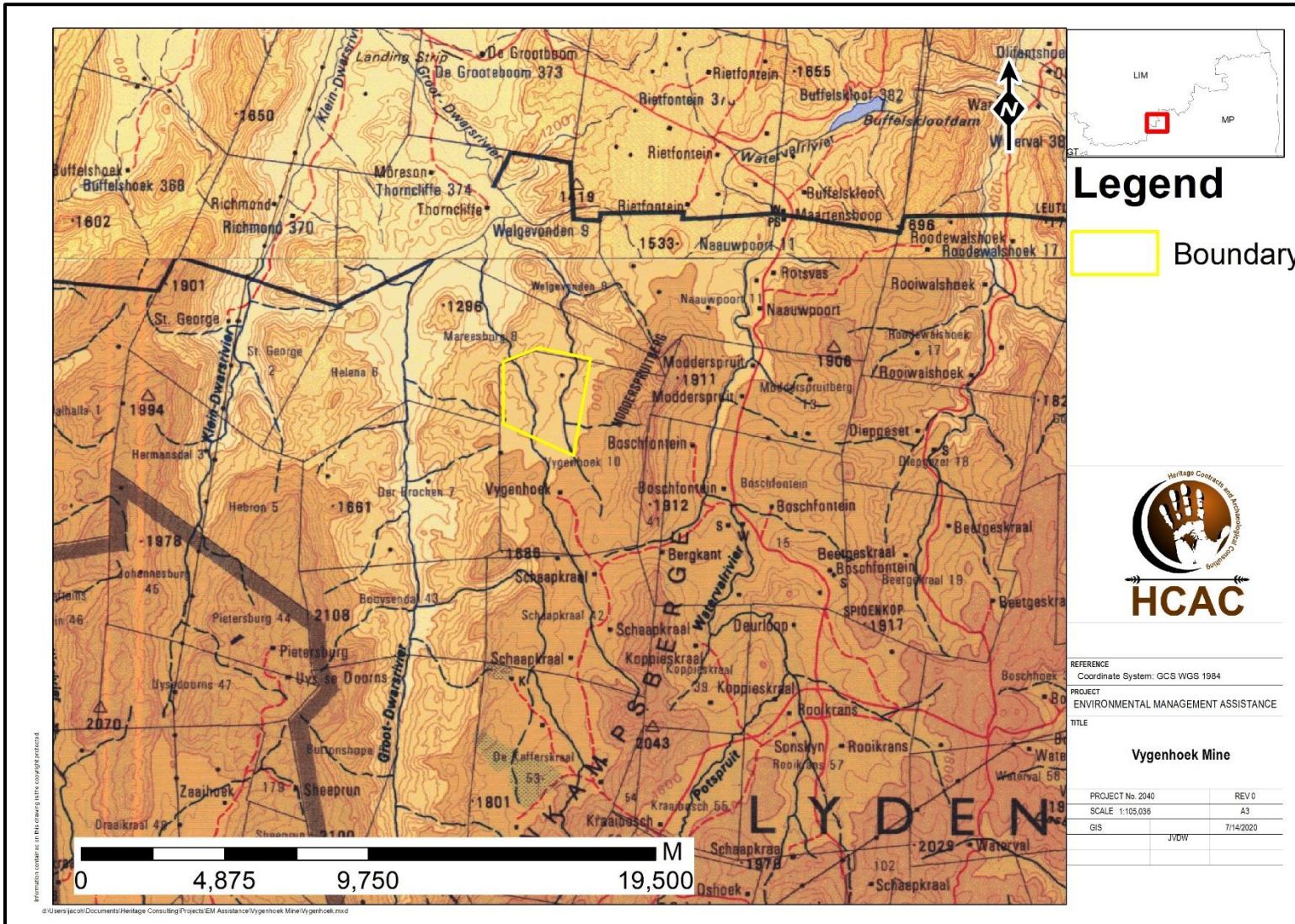


Figure 1-1. Regional setting (1: 250 000 topographical map) showing Vygenhoek farm.

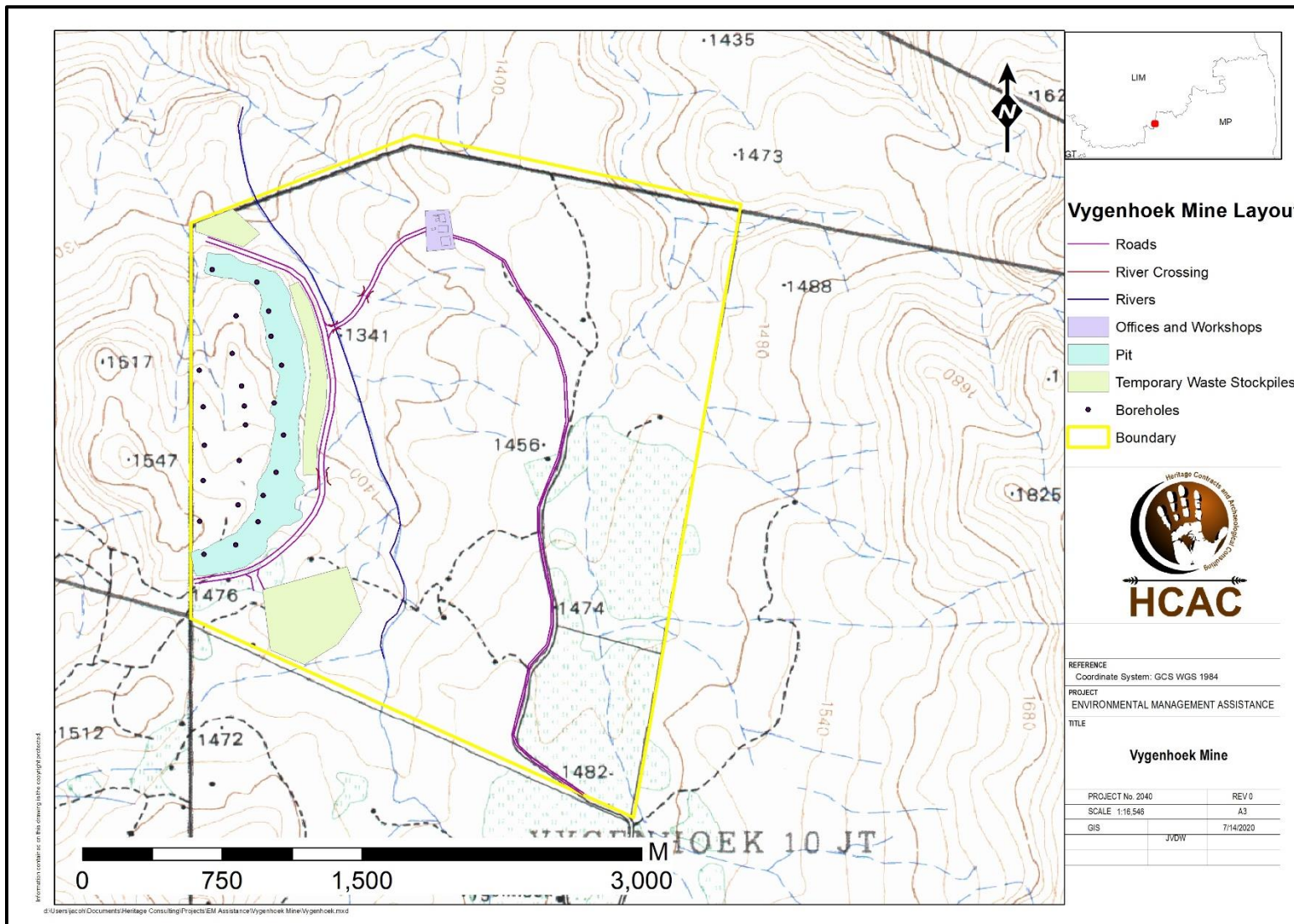


Figure 1-2: Local setting (1:50 000 topographical map) outlining the original development footprint.

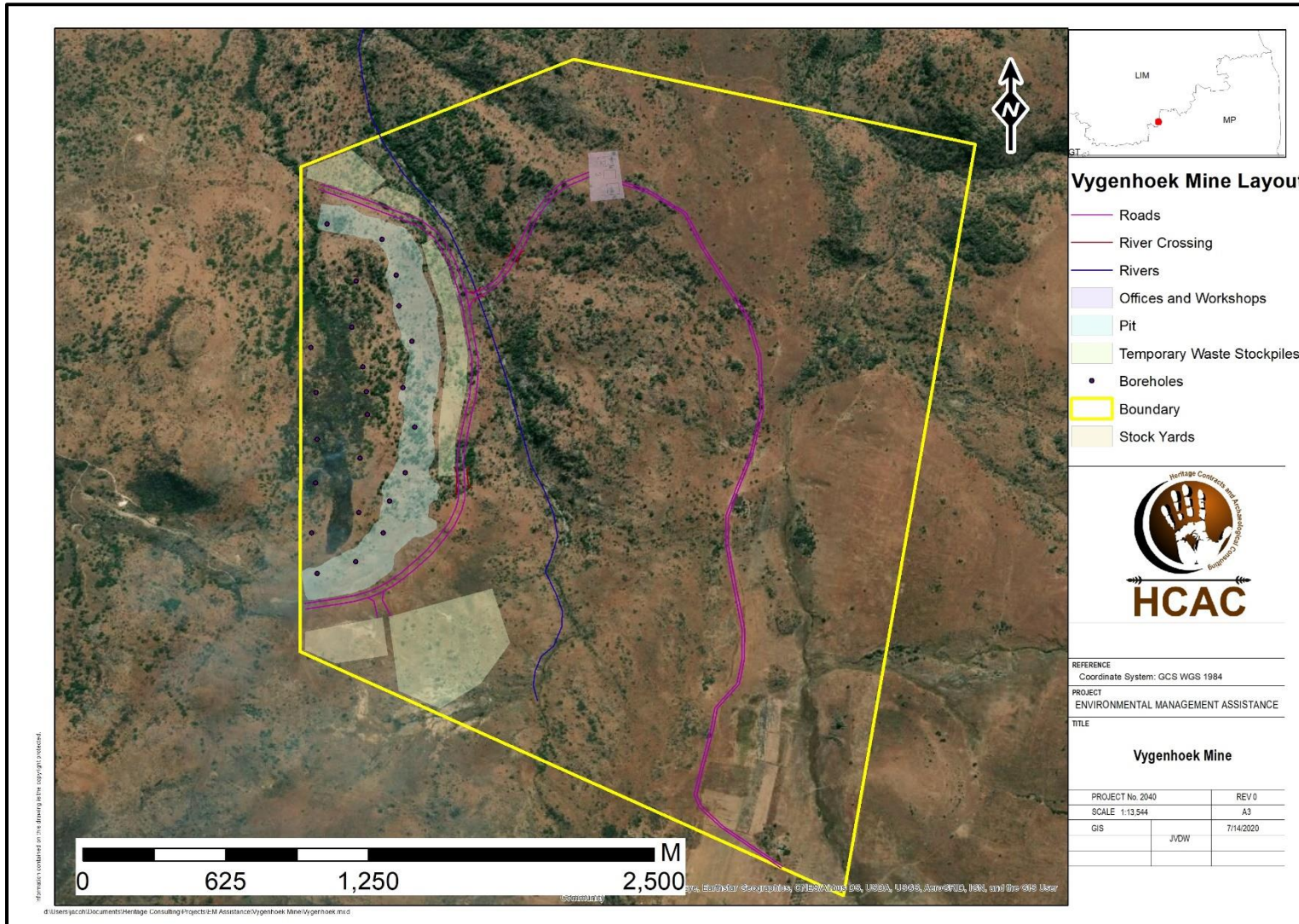


Figure 1-3. Aerial image of the original development footprint.

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of an Environmental Impact Assessment Report (EIAR).

3.4 Site Investigation

The aim of the site survey was to:

- a) survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;
- b) record GPS points of sites/areas identified as significant areas;
- c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	7 December 2020
Season	Summer- Archaeological visibility was low due to the high level of vegetation cover throughout the study area. The area was however sufficiently covered to understand the heritage character of the study area (Figure 3-1).

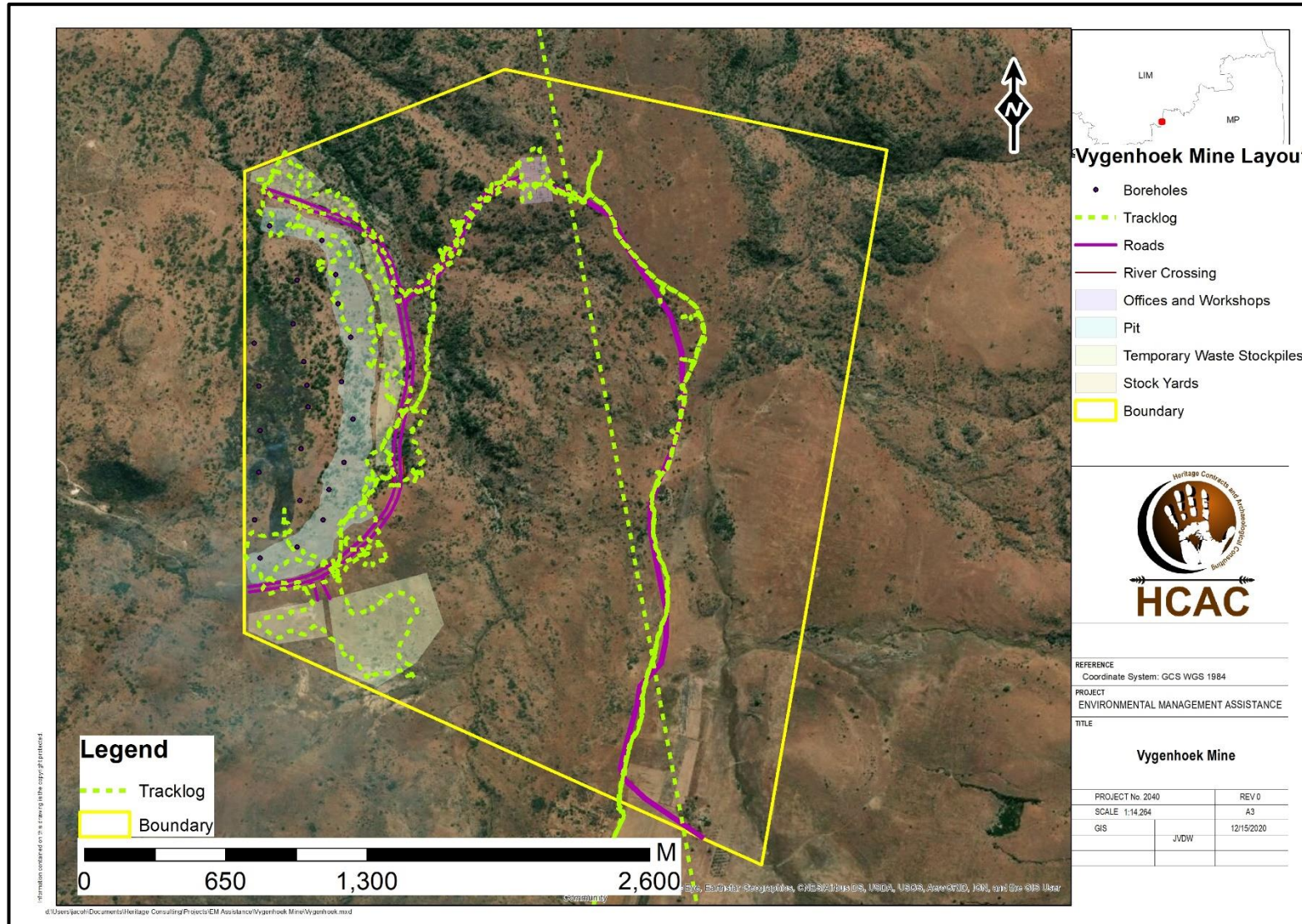


Figure 3-1: Tracklog of the survey in green.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5. Heritage significance and field ratings

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

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of cultural deposits and the extent of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

The following information was obtained from StatsSA.gov.za: According to Census 2011, the Thaba Chweu Local Municipality has a total population estimated at 98 387. Of the population, 81,6% are black African, 14,5% are white, and 2,6% are coloured, with other population groups making up the remaining 1,2%. Of those aged 20 years and older, 4,5% have completed primary school, 33,7% have some secondary education, 30,7% have completed matric, and 9,6% have some form of higher education. There are 35 972 employed persons, and 2 213 persons are classified as discouraged work-seekers. The total unemployment rate is estimated at 20,5%. Of the youth (15–35 years), 16 624 are employed and 1 500 are discouraged work-seekers, with a total unemployment rate of 27,1%.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. During the stakeholder consultation process numerous community members raised concerns regarding burial sites that are in the area. Affected families include the Choma Royal family, The Mohlahlo family, the Jiya family amongst others. The Choma family also mentioned that intangible/living heritage sites occur in the area. The heritage team liaised with Mr. Lazarus Choma and arranged to meet on site to discuss heritage resources in the study area. Due to the extensive number of features this did not materialise, and it is agreed that consultation with the relevant stakeholders should be conducted at a later stage when the final mine layout is available.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

In anticipation of other mining activities in the greater study area, archaeologists have completed numerous heritage surveys including Huffman & Schoeman 2001, 2002 a and b; van Schalkwyk 2005; Roodt 2003a, 2003b, 2003c, 2005, 2008a, 2008b; Van der Walt & Fourie 2006; Van der Walt & Celliers 2009; Van der Walt 2009; 2016 and Pistorius 2007, 2010, 2011 for various Environmental Impact Assessment Reports (EIAs) and Environmental Management Programmes (EMPs). These studies provide a good understanding of the archaeology of the area and use of the wider landscape. Since 2001, heritage surveys have recorded more than 240 sites in the greater study area, ranging from the Middle Stone Age (MSA) to the recent households of farm labourers. The following CRM studies (Table 6) were conducted in the immediate area and were consulted for this report:

Table 6. Heritage Reports conducted close to the study area.

Author	Year	Project	Findings
Huffman, T. N. and Schoeman, A.	2002	Archaeological Assessment Of The Der Brochen Project, Mpumalanga	25 sites or occurrences, ranging from the Middle Stone Age to the Iron Age and Historic Pedi.
Roodt, F.	2003	Phase 1 Heritage Impact Assessment Der Brochen Tailings Dams Farms: Helena And St. George Mpumalanga Province	39 sites were recorded ranging from the Iron age to burial sites.
Van der Walt, J. and Fourie, W.	2007	Mining development for Mareesburg 8JT Mpumalanga, Archaeological Impact Assessment	3 Iron Age sites
Matoho, E.	2012	Preliminary Report Of The Investigation Of The Late Iron Age Stone Wall Enclosure Site Identified On The Farm Schaapkraal 42jt, Mpumalanga Province	Iron Age features and burial sites.
Du Piesanie, J and Higgitt, N.	2012	Heritage Impact Assessment for the Everest North Mining 2530 AA, Vygenhoek 10JT, Mpumalanga.	50 Sites recorded ranging from Stone Age, Iron Age and burial sites as well as historical features.
Coetzee, T.	2018	Phase 1 Archaeological Impact Assessment For Environmental Assurance (Pty) Ltd for the Construction of the Mareesburg Haul Road near Boschfontein, Mpumalanga	Seven historical sites consisting of angular stone walling, as well as buildings constructed from bricks and cement; 10 LIA / Farmer sites consisting of linear stone walling and stone-walled enclosures; six stone cairns that might be grave sites; two formal graveyards and two modern sites.

The study conducted by Du Piesanie and Higgitt covered the project footprint and surrounding area recording 50 heritage features ranging from Stone Age artefacts to historical Trig beacons (Du Piesanie and Higgitt 2012).

6.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

6.2 Background to the general area

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2012). The three main phases can be divided as follows:

- Earlier Stone Age: associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.
- Middle Stone Age: associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Later Stone Age: associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago

Very few Early Stone Age sites are on record for Mpumalanga and no *in situ* sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

Middle Stone Age isolated artefacts are known to occur in the general area. Finds typically include radial cores, triangular points and flakes. These artefacts are usually scattered too sparsely to be of any significance (Van der Walt 2016). Evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district located about 70 km from the project area. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present) while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). At Bushman Rock Shelter the MSA is also represented and starts at around 12 000 BP but only lasted for some 3 000 years.

The LSA is of importance in geological terms as it marks the transition from the Pleistocene to the Holocene which was accompanied by a gradual shift from cooler to warmer temperatures. This change had its greatest influence on the higher lying areas of South Africa. Both Bushman Rock Shelter and another site, Heuningneskrans, have revealed a greater use in plant foods and fruit during this period (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebra, warthog and bovinds of various sizes. They also diversified their protein diet by gathering tortoises and land snails (*Achatina*) in large quantities.

Ostrich eggshell beads were found in most of the levels at these two sites. It appears that there is a gap of approximately 4 000 years in the Mpumalanga LSA record between 9 000 BP and 5 000 BP. This may be a result of generally little Stone Age research being conducted in the province. It is, however, also a period known for rapid warming and major climate fluctuation which may have led people to seek out protected environments in this area. The Mpumalanga Stone Age sequence is visible again during the mid-Holocene at the farm Honingklip near Badplaas in the Carolina district (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

The LSA period is also associated with rock engravings and rock paintings. Approximately 400 rock art sites are distributed throughout Mpumalanga and can be divided into San rock art, herder or Khoehoe (Khoi Khoi) paintings (thin scattering from the Limpopo Valley) through the Lydenburg district into the Nelspruit area) and localised late white farmer paintings. Farmer paintings can be divided into Sotho-

Tswana finger paintings and Nguni engravings (Only 20 engravings occur at Boomplaats, north-west of Lydenburg). Farmer paintings are more localised than San or herder paintings and were mainly used by the painters for instructional purposes (Smith & Zubieta 2007).

A rock engraving which date from the more recent past were recorded against the eastern slope of the Groot Dwars River Valley (Huffman & Schoeman 2001, 2002[a], 2002[b] & 2002[c]) and it is possible that more engravings may exist in this valley.

6.3 The Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. Most of the decorated pottery found in the study area belongs to the stylistic facies known as *Eiland*. This style dates to between 1550 AD and 1750 AD and was made by Sotho-Tswana people (Huffman 2007: 186-189). These Middle Iron Age Sites do not have any stone walling associated with them and is found close to cultivatable soil. Some stylistic *Marateng* pottery were also recorded presumably in association with Late Iron Age stone walled settlements. *Marateng* pottery dates to between 1650 AD and 1840 AD (Huffman 2007: 207). Also refer to Section 6.7 for a discussion on the Iron Age Cultural Landscape.

6.4 Historical Information

European occupation began in 1845 when trekkers established Ohrigstad and then Lydenburg a few years later. Originally, the trekkers were interested in ivory, but they also needed land and labour for agriculture. Tensions with African communities over these needs rose to such a point that the Trekkers attacked the Pedi capital in 1852. They failed, however, to destroy Pedi authority. Somewhat later, they negotiated a peace with Sekwati and traded cattle for land. Boers then started to establish farms in the region. GS Maree, for example, settled on Maresburg in 1871. Tensions over land and labour increased again until the ZAR attacked the Pedi capital in 1876: this battle also failed to break Pedi resistance.

This brief historical outline helps to date some other sites in the study area. In particular, a number of settlements located around high meadows probably date from 1860 to 1880, when tensions were high but before major European occupation of local farms.

6.5 Anglo-Boer War Sites

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date. No sites relating to the war are known to occur in the study area.

6.6 Cultural Landscape

The cultural landscape of the region is characterised by a rural area that is extensively disturbed by mining activities and in the past by agricultural activities. Interestingly historical and archaeological land use as indicated by the distribution of recorded sites on the landscape show different land use patterns. Many agriculturally orientated societies (making *Eiland*, *Leolo* and *Marateng* pottery) built their villages in the valleys near cultivatable alluvium. Others (probably *Ndebele*) built terraced settlements on basal slopes of the valley edge, while farm labourers usually lived in the valleys as well.

During the 19th Century, farmers lived around the edge of high meadows as a measure of protection. A few Middle Iron Age *Eiland* sites were also cited in this plateau environment. The northern portions of the pit area is located along steep slopes not suitable for occupation in antiquity while the rest of the development is located in gentler slopes where settlements are expected (Figure 6-1).

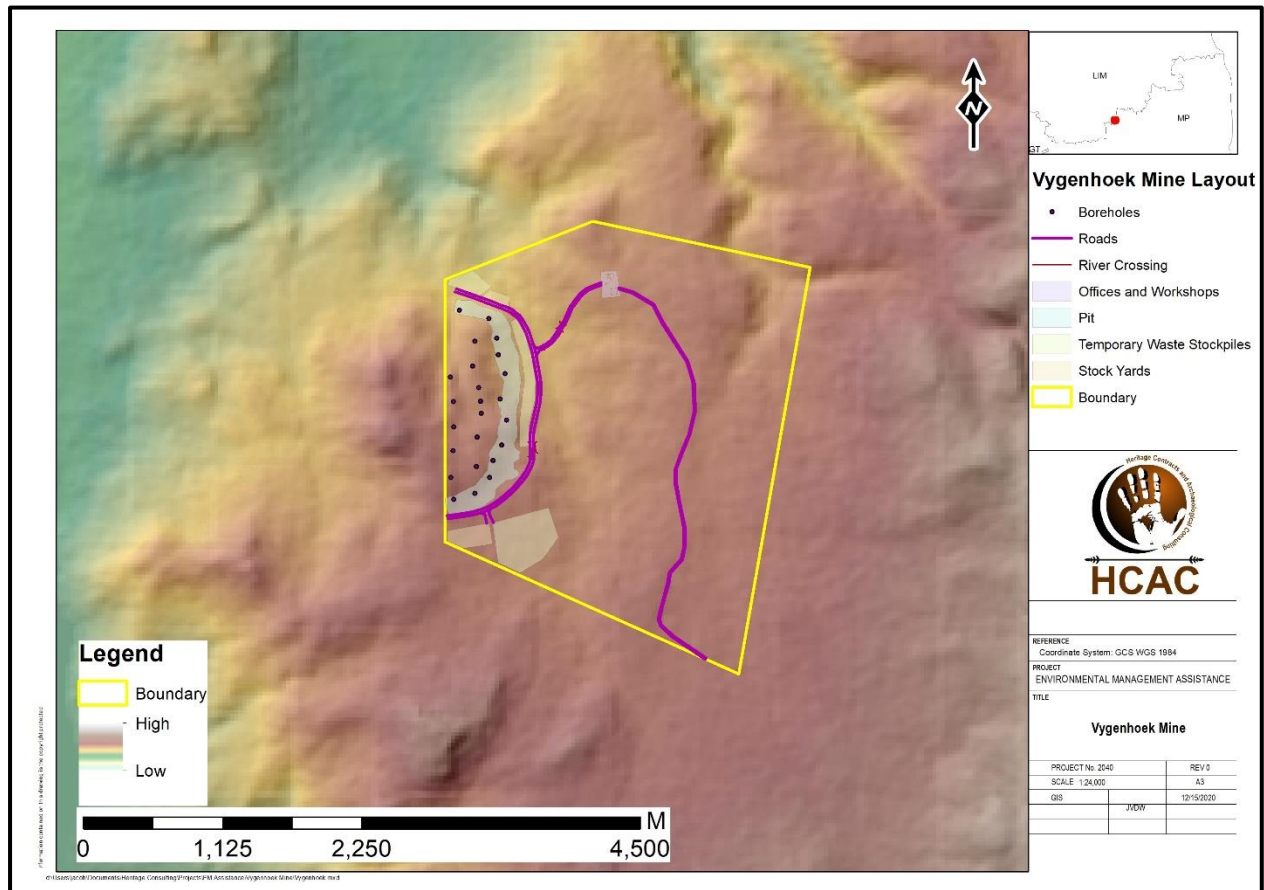


Figure 6-1. Landscape setting of the project.

6.7 Graves and Burial Sites

Graves and cemeteries are widely distributed across the landscape and can be expected anywhere.

7 Description of the Physical Environment

The study area forms part of the Dwars River Valley part of the Bushveld Igneous Complex. Impacts present in the area include previous agricultural activities as well as exploration roads used for monitoring and exploration purposes. In terms of vegetation, the study area falls within the Savannah Biome, which covers approximately 32.8% of South Africa (Mucina & Rutherford 2006) and locally the Sekhukhune Montane Grassland Vegetation type which is considered vulnerable and vast sections are mined for vanadium using strip mining. The majority of this vegetation type is associated with a very low erosion rate (Mucina & Rutherford 2006).

Topographically, the area is mountainous (Figure 7-1) with stretches of more dense vegetation (Dichrostachys shrubs) and a number of large hills and valleys. Several streams (Figure 7-2) and tributaries run through the study area that could have been the water source for communities living in the area in antiquity. The project is located on undulating hills on top of an escarpment that descends into a hilled area (Figure 7-3).



Figure 7-1. General view of the pit area.



Figure 7-2. Stream in the study area.



Figure 7-3. General site conditions.

8 Findings of the Survey

It is important to note that the survey only focused on the impact area as indicated in Figure 1-1 to 1-3 and was conducted by two archaeologists. The larger study area was previously surveyed by Du Piesanie and Higgitt (2012) and Pistorius (2006). The survey design of the current fieldwork was to revisit selected sites previously recorded and to assess areas not covered during the previous assessments that could be of interest. Based on these surveys more than 50 heritage features are now on record for the immediate study area (Figure 8-1 & Table 7). These sites range from the MSA to the Iron Age and historical/recent periods, highlighting the cultural significance of the area. Table 7 summarises the sites recorded during the different assessments, who recorded it, with a brief description and significance rating. Significance ratings provided in the original assessments were retained for continuity in the consolidated table. These significance ratings do not necessarily tie in directly with the field rating significance rating methodology in Section 3 of this report and site-specific recommendations are applicable. Below is a brief description of the heritage resources recorded.

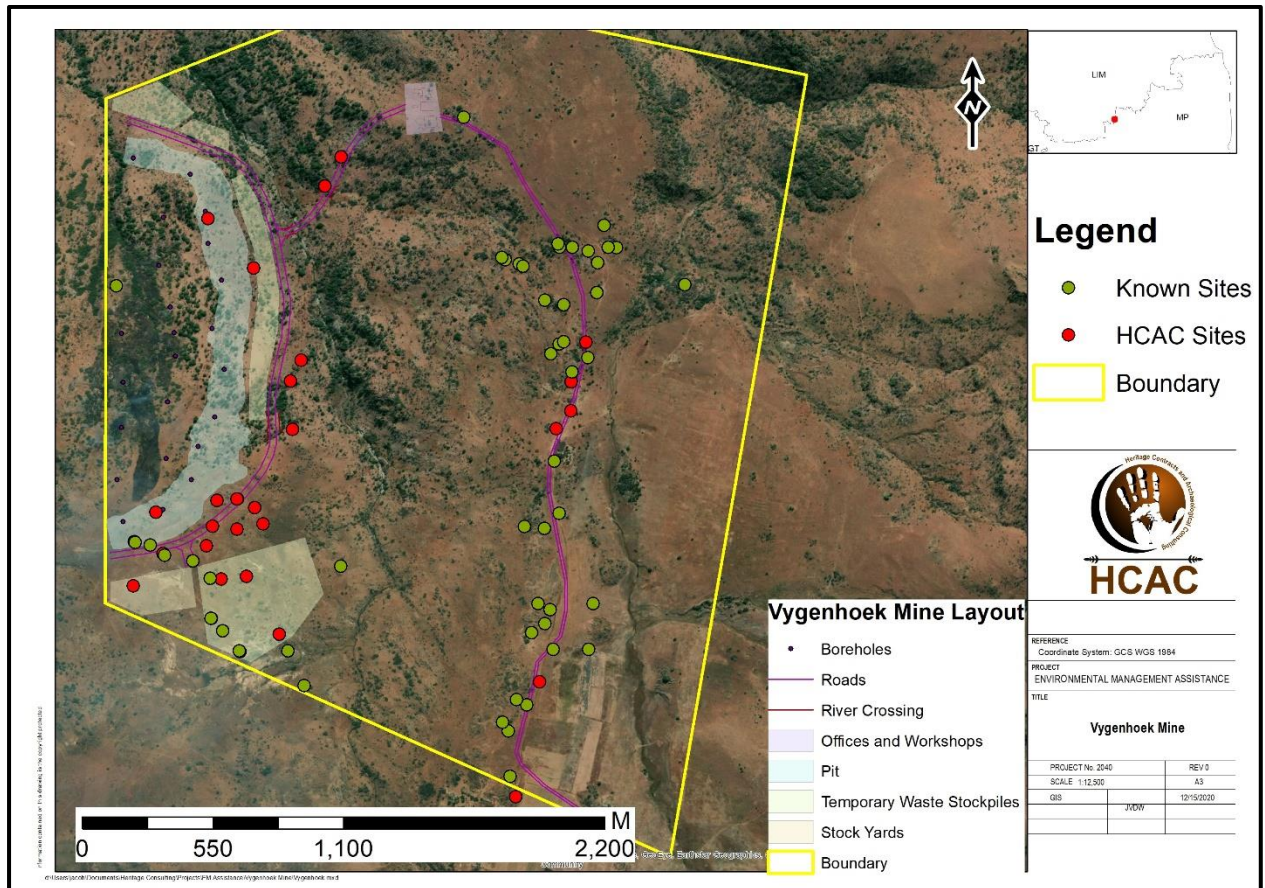


Figure 8-1. Site distribution map in relation to the initial layout.

Table 7. Heritage features on record for the study area.

Feature Number	Description	Source	Significance
HCAC 1	Ephemeral stone walling disturbed by exploration roads	HCAC 2020 Survey	Low significance
HCAC 2	Rectangular stone walls & mud brick dwellings - part of Choma Village.	HCAC 2020 Survey	Medium significance
HCAC 3	Circular Stone Wall enclosure	HCAC 2020 Survey	Medium significance
HCAC 4	Mud brick foundation of dwelling	HCAC 2020 Survey	Medium significance
HCAC 5	Rectangular cattle kraal entrance marked by monoliths	HCAC 2020 Survey	Medium significance
HCAC 6	Rectangular stone walled kraal.	HCAC 2020 Survey	Medium significance
HCAC 7	Cemetery - 2 graves with inscriptions of Makgaleh Cho Mapelego, date is not clearly discernible 18- 8 – 1941?. Second grave of Choma Mathale Moruti who passed away in 1963.	HCAC 2020 Survey	High Social Significance
HCAC 8	Approximately 8 graves with two headstones including the Grave of Choma Mogalagadi Ngwatladi.	HCAC 2020 Survey	High Social Significance
HCAC 9	Recent occupation of the site marked by makeshift structures and small rectangular stone packed foundations.	HCAC 2020 Survey	Low significance
HCAC 10/ DW039	Stone walling. Large, well preserved circular stone walling. Lower grindstone identified.	Du Piesanie and Higgitt 2012 and HCAC 2020 Survey	Medium Significance
HCAC 11/ Choma Village	7 Stone packed graves possibly of children. One grave has a formal headstone of Matupe Lucas. Passed away in 1978.	Pistorius 2006 and 2020 Survey	High Social Significance
HCAC 12	2 Graves located in a cattle kraal. One is a stone packed grave the other has a cement headstone with the inscription Choma on it.	HCAC 2020 Survey	High Social Significance
HCAC 13	Rectangular wall next to rocky outcrop	HCAC 2020 Survey	Low Significance
HCAC 14	Stone walled site. Multiple ephemeral packed stone walls and Terracing	HCAC 2020 Survey	Low Significance
HCAC 15	Partial Stone walled site. Sections of ephemeral packed stone walling and terracing. Terrace wall situated between and ridge and natural outcrop in a fairly straight line.	HCAC 2020 Survey	Low to medium significance

HCAC 16	Multiple ephemeral packed stone walls and terraces built between a ridge and natural outcrop.	HCAC 2020 Survey	Low Significance
HCAC 17	2 x Graves. • Cement gravestone + packed stone Skirting with cement on top, MOHLAHLA Date: 19—(weathered) • Metal grave marker, packed stone skirt with no fill. THAPA no date	HCAC 2020 Survey	High Social Significance
HCAC 18	Portion of small enclosure with Ephemeral packed stone walling. 5mX5m	HCAC 2020 Survey	Low Significance
HCAC 19	Possibly Iron Age site. Multiple packed stone enclosures and ephemeral packed stone walls. Some of the enclosures are circular. Site also contains terraces measuring 50mX50m. The site is situated fairly high on the shoulder of the hill between two large rocky outcrops.	HCAC 2020 Survey	Medium Significance
HCAC 20	Extent of Large historical site.	HCAC 2020 Survey	Medium Significance
HCAC 21/ DW035	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.	Du Piesanie and Higgitt 2012 and 2020 Survey	Low Significance
HCAC 22/ DW033	Findspot in erosion gully. MSA and LSA tools identified. Single potsherd with notch identified.	Du Piesanie and Higgitt 2012 and 2020 Survey	Low Significance
HCAC 23	Multiple MSA artefacts located within an erosion gully. Triangular flakes with faceted platforms. Artefacts are out of context.	HCAC 2020 Survey	Low Significance
HCAC 24	Stone walled feature. Ephemeral packed stone walls. Possibly rectangular.	HCAC 2020 Survey	Low Significance
HCAC 25	Portion of an ephemeral packed stone wall.	HCAC 2020 Survey	Low Significance
HCAC 26/ DW 017	Ephemeral stone wall close to planned Haul road.	HCAC 2020 Survey	Low significance
HCAC 27	Ephemeral wall impacted on by current access road.	HCAC 2020 Survey	Low significance
HCAC 28	Ephemeral wall impacted on by current access road.	HCAC 2020 Survey	Low significance
HCAC 29/ DW003	Ephemeral terrace wall impacted on by current access road.	HCAC 2020 Survey	Low Significance
HCAC 30	Rectangular stone wall feature.	HCAC 2020 Survey	Low significance
DW001	Extensive stone walled site, with terraced walling. Possibly Badfontein type walling with communal grinding area. Decorated potsherds found scattered between walling. Located next to current homestead and road.	Du Piesanie and Higgitt 2012	Medium High Significance
DW002	Stone feature, possibly from clearing.	Du Piesanie and Higgitt 2012	Low significance
DW003	Stone walling on rise along road. Used natural boulders in the walling. Potsherds were noted on the site, decorated and undecorated.	Du Piesanie and Higgitt 2012	Low to medium significance

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DW004	Stone walling on rise, some terraced walling. Associated communal grinding area to the south of the stone walls. Close to site DW003.	Du Piesanie and Higgitt 2012	Low to medium significance
DW005	Stone walling on rise, some terraced walling. Associated communal grinding area to the south of the stone walls. Close to site DW003.	Du Piesanie and Higgitt 2012	Low to medium significance
DW006	Stone features, including walling, circles and mounds. Potsherds noted at site.	Du Piesanie and Higgitt 2012	Low to medium significance
DW007	Stone walling associated with a rise, located along a road. Undecorated potsherds were noted at the site.	Du Piesanie and Higgitt 2012	Low to medium significance
DW008	Stone Walled site with a communal grinding area (DW009). Natural boulders were used for the construction of the walling.	Du Piesanie and Higgitt 2012	Low to medium significance
DW009	Stone Walled site with a communal grinding area (DW009). Natural boulders were used for the construction of the walling.	Du Piesanie and Higgitt 2012	Low to medium significance
DW010	Stone walling at the base of a rise. Some terracing. Potsherds and an upper grind stone noted at the site.	Du Piesanie and Higgitt 2012	Low to medium significance
DW011	Some walling, some terracing on the northern side. Possible communal grinding area associated with stone walling.	Du Piesanie and Higgitt 2012	Low to medium significance
DW012	Single burial. Name on headstone: Moraka Phillimon Lekgeu. Rising sun image on headstone.	Du Piesanie and Higgitt 2012	Medium High Significance
DW013	Stone Walling with possible communal grinding area in close proximity.	Du Piesanie and Higgitt 2012	Low to medium significance
DW014	Stone walling around natural boulders. Walls are large and well preserved, with an enclosure approximately 15 m in diameter.	Du Piesanie and Higgitt 2012	Medium High Significance
DW015	Stone walling associated with a rise. Communal grinding area in close proximity. Potsherds.	Du Piesanie and Higgitt 2012	Low to medium significance
DW016	Single findspot of MSA flake and potsherd on open, exposed rock surface.	Du Piesanie and Higgitt 2012	Low significance
DW017	Grinding surface area. Single MSA faceted quartzite flake identified.	Du Piesanie and Higgitt 2012	Low significance
DW018	Stone Walling - natural boulders packed with stone. Not substantial.	Du Piesanie and Higgitt 2012	Low to medium significance
DW019	Substantial stone walling, large and well preserved. Enclosure of approximately 15 m diameter with a clearly defined entrance.	Du Piesanie and Higgitt 2012	Medium High Significance
DW020	Stone walling. Not extensive.	Du Piesanie and Higgitt 2012	Low to medium significance
DW021	Stone walling. Not extensive and not well preserved.	Du Piesanie and Higgitt 2012	Low significance
DW022	Stone walling - double walling, straight and approximately 10 m long.	Du Piesanie and Higgitt 2012	Low to medium significance
DW023	Burial site. 5 graves with no formal headstones. Site lies directly next to D022. Graves have stone surface and are well tended.	Du Piesanie and Higgitt 2012	Medium High Significance

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DW024	Stone walling - enclosure approximately 5 m in diameter.	Du Piesanie and Higgitt 2012	Low to medium significance
DW025	Burial site. 8 graves with formal headstones and grave dressing. Surface grave goods associated with the graves.	Du Piesanie and Higgitt 2012	Medium High Significance
DW026	Stone walling collapsed and not extensive or well preserved.	Du Piesanie and Higgitt 2012	Low significance
DW027	Stone walling. Straight and approximately 20 m long. Enclosure with entrance. Next to communal grinding area.	Du Piesanie and Higgitt 2012	Medium High Significance
DW028	Stone walling. Straight and approximately 20 m long. Enclosure with entrance. Next to communal grinding area.	Du Piesanie and Higgitt 2012	Medium High Significance
DW029	Recent homestead - old fencing found. Cleared area and tomato plants growing. No other physical structures identified.	Du Piesanie and Higgitt 2012	Low significance
DW030	Stone foundations	Du Piesanie and Higgitt 2012	Low significance
DW031	Grinding surface area.	Du Piesanie and Higgitt 2012	Low to medium significance
DW032	Stone walling. Single stone wall. Possibly for erosion gully.	Du Piesanie and Higgitt 2012	Low to medium significance
DW034	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.	Du Piesanie and Higgitt 2012	Medium High Significance
DW036	Stone walling. Stone wall foundations with communal grinding area. Rectangular in shape.	Du Piesanie and Higgitt 2012	Low to medium significance
DW037	Stone walling - scatter of small stone walls in front of Choma village. Lower grindstone and potsherds found in wash around stone walls. Associated with larger Choma Village.	Du Piesanie and Higgitt 2012	Low to medium significance
DW038	Stone Walling - rectangular walling. Porcelain found amongst walling. Potsherds also found. Associated with Choma Village.	Du Piesanie and Higgitt 2012	Low to medium significance
DW040	Stone walling - Large, well preserved circular stone enclosure approximately 3 m in diameter on the slope of a rise at the bottom of Choma Village.	Du Piesanie and Higgitt 2012	Low to medium significance
DW041	Grinding surface with 6 large, well defined grinding stone.	Du Piesanie and Higgitt 2012	Low to medium significance
DW042	Burial site. Area is fenced off and untended. 5 identified graves with headstones and formal grave dressing, the remainder with stone dressing.	Du Piesanie and Higgitt 2012	Medium High Significance
DW043	Burial site. Area is fenced off and also had large stone walling at its entrance. It is tended. 12 grave sites were identified, 7 with headstones and formal dressing. The remainder with stone dressing. 1 Lower grindstone identified.	Du Piesanie and Higgitt 2012	Medium High Significance

DW044	Burial site. Area is fenced off and also had large stone walling at its entrance. It is tended. 12 grave sites were identified, 7 with headstones and formal dressing. The remainder with stone dressing. 1 Lower grindstone identified.	Du Piesanie and Higgitt 2012	Medium High Significance
DW045	Single findspot. Large lower grindstone.	Du Piesanie and Higgitt 2012	Low significance
DW046	Lower grinding stone.	Du Piesanie and Higgitt 2012	Low to medium significance
DW047	Single monolith. Possible headstone. No other feature identified.	Du Piesanie and Higgitt 2012	Medium High Significance
DW048	Possible single burial site.	Du Piesanie and Higgitt 2012	Medium High Significance
DW049	Stone walling. Single L-shaped wall.	Du Piesanie and Higgitt 2012	Low to medium significance
DW050	Historic - Trig Beacon	Du Piesanie and Higgitt 2012	Low significance
Choma Village	Historical settlement complex. Several stone walled circles in primary context. Potsherds scattered throughout settlement, several lower grind stones.	Pistorius 2006	High significance
C004	Burial site located within the Choma Village Complex. Surrounded by stone wall enclosure, large and intact.	Pistorius 2006	Medium High Significance

8.1 Historic Features (Choma Village and ephemeral stone walled sites)

A large settlement complex recorded by Du Piesanie & Higgitt (2012) and Pistorius (2006) as the Choma village was revisited. The Choma village is an extended historical village including historical features and more recent occupation that represents a cultural landscape and includes royal Choma graves and intangible features. Several different features ranging from stone walled enclosures, mud brick dwellings, burial sites and the remains of recent temporary dwellings (Figure 8-4 to 8-7). A possible Later Iron Age component could also occur here predating the Choma settlement. This settlement as a whole is of medium to high significance with the people who have ties to the complex still residing in the area. Burial sites within this settlement are of high social significance. Several intangible heritage sites occur in the area (Digby Wells 2012) and should be further investigated as a condition of authorisation. The main settlement is located within the pit & haul roads (Figure 8-2) with smaller features located to the south that forms part of the main complex according to Du Piesanie & Higgitt (2012). The sites in Table 8 are related to this settlement.

Several other stone walled structures occur throughout the area. These are mostly ephemeral walling often forming part of terracing or rectangular stone foundations. It is not clear if these are recent or historical due to their ephemeral nature and lack of associated cultural material. Most of these are also impacted on by existing roads and exploration activities in the area. These features are generally of low to low medium heritage significance but are forming part of the collective whole and should therefore be recorded and mitigated (Table 9).

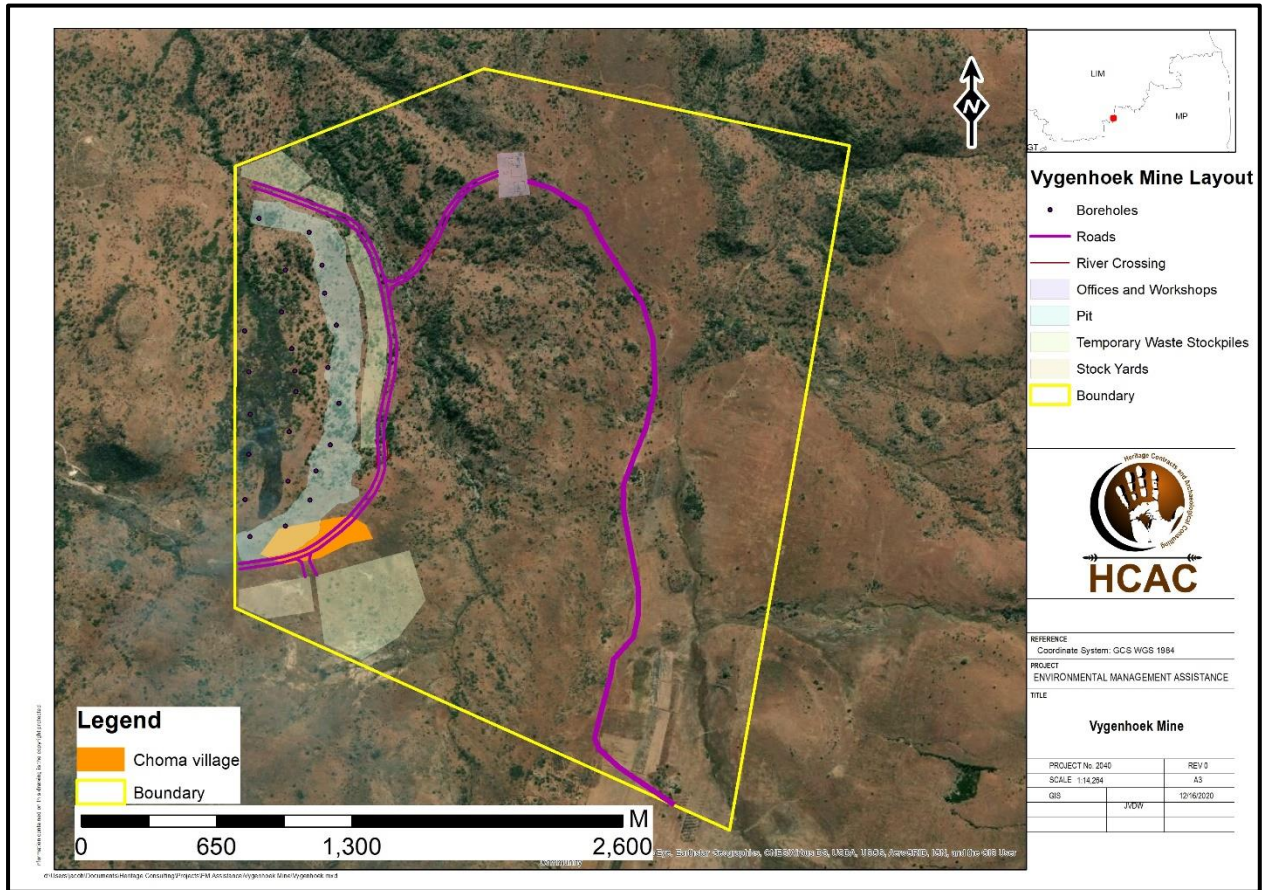


Figure 8-2. Approximate extent of the Choma settlement located within the proposed pit and haul roads as per the original layout.

Table 8. Sites related to Choma village and illustrated in Figure 8-3.

Feature Number	Longitude	Latitude	Description
HCAC 2	30° 09' 10.5373" E	25° 02' 51.1044" S	Rectangular stone walled enclosures, mud brick dwellings -
HCAC 3	30° 09' 13.2875" E	25° 02' 54.9961" S	Circular Stone Wall enclosure
HCAC 4	30° 09' 16.8191" E	25° 02' 54.3084" S	Mud brick foundation of dwelling
HCAC 5	30° 09' 15.7211" E	25° 02' 52.1087" S	Rectangular cattle kraal entrance marked by monoliths
HCAC 6	30° 09' 13.3273" E	25° 02' 50.8920" S	Rectangular stone walled kraal.
HCAC 7	30° 09' 13.2875" E	25° 02' 50.8920" S	Cemetery - 2 graves with inscriptions of Makgaleh Cho Mapelego date is not discernible 18- 8 - 1941. Choma Mathale Moruti Passed away in 1963.
HCAC 8	30° 09' 09.9577" E	25° 02' 54.6253" S	Approximately 8 graves with two headstones including the Grave of Choma Mogalagadi Ngwatladi no dates.
HCAC 9	30° 09' 09.1403" E	25° 02' 57.2568" S	Later occupation of the site marked by makeshift structures and small rectangular stone packed foundations.
HCAC 20	30° 08' 59.1539" E	25° 03' 02.7251" S	Extent of Large historical site.

HCAC 21/ DW035	30.152708	25.051990	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.
HCAC 24	30° 09' 14.5693" E	25° 03' 01.4689" S	Stone walled feature. Ephemeral packed stone walls. Possibly rectangular.
HCAC 25	30° 09' 11.1312" E	25° 03' 01.8289" S	Portion of an ephemeral packed stone wall.
DW034	30.153147	25.052452	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.
DW036	30.152679	25.050468	Stone walling. Stone wall foundations with communal grinding area. Rectangular in shape.
DW037	30.152018	25.049819	Stone walling - scatter of small stone walls in front of Choma village. Lower grindstone and potsherds found in wash around stone walls. Associated with larger Choma Village.
DW038	30.150404	25.049223	Stone Walling - rectangular walling. Porcelain found amongst walling. Potsherds also found. Associated with Choma Village.
DW040	30.157619	25.050016	Stone walling - Large, well preserved circular stone enclosure approximately 3 m in diameter on the slope of a rise at the bottom of Choma Village.
Choma Village	30.150950	25.049600	Historical settlement complex. Several stone walled circles in primary context. Potsherds scattered throughout settlement, several lower grind stones.
C004	30.150950	25.049600	Burial site located within the Choma Village Complex. Surrounded by stone wall enclosure, large and intact.

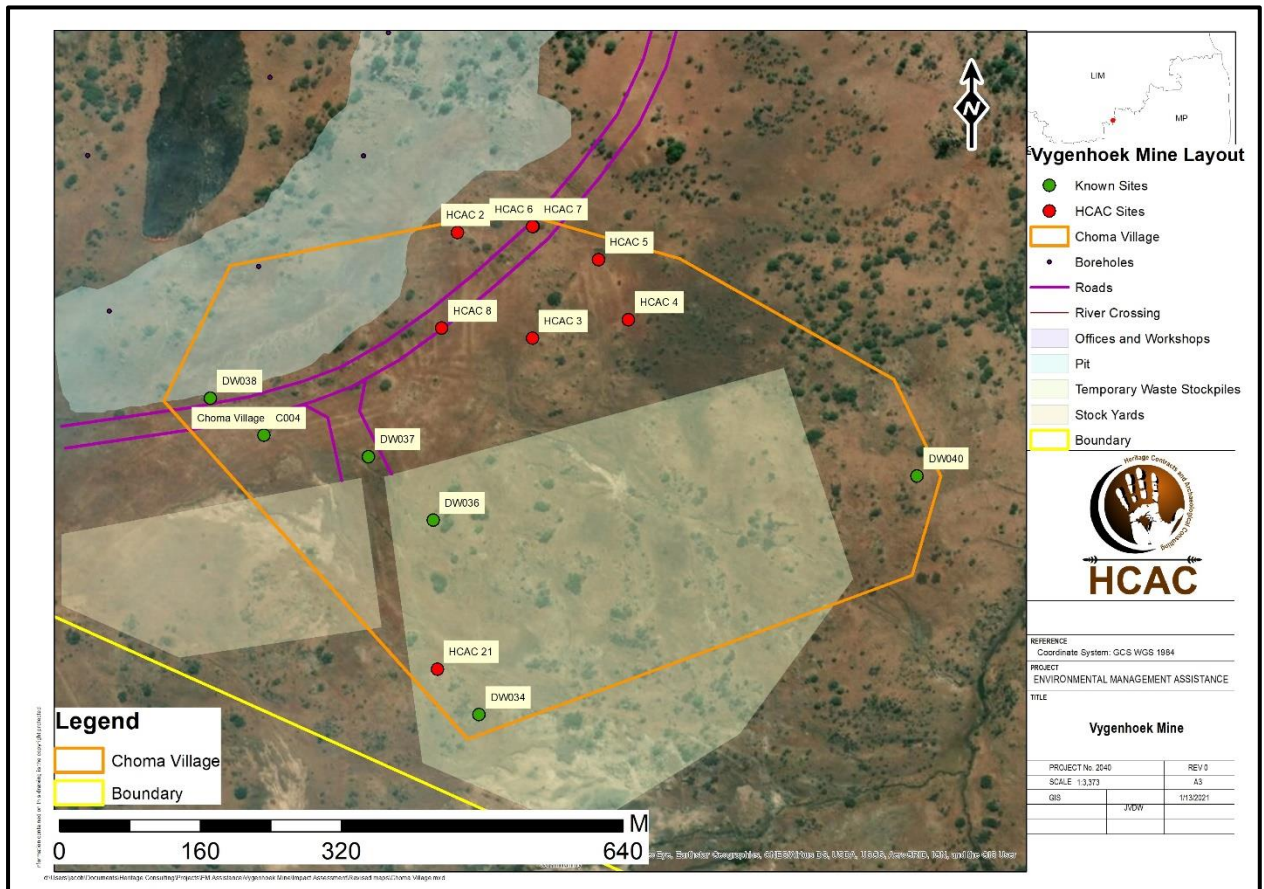


Figure 8-3: Sites mentioned in the text relating to the Choma village.



Figure 8-4: Rectangular cattle kraal at HCAC 006.



Figure 8-5: General view of the settlement with boundary wall.



Figure 8-6: Foundations of mudbrick dwellings.



Figure 8-7: Entrance to cattle kraal marked by monoliths at HCAC 005.

Table 9. Recent/ Historical sites

Feature Number	Longitude	Latitude	Description
HCAC 1	30° 09' 09.3059" E	25° 02' 12.7860" S	Ephemeral partly disturbed walling
HCAC 10/ DW039	30.149830	25.049115	Stone walling. Large, well preserved circular stone walling. Lower grindstone identified.
HCAC 13	30° 09' 58.8349" E	25° 02' 34.9727" S	Rectangular wall next to rocky outcrop
HCAC 14	30° 09' 27.4751" E	25° 02' 04.3657" S	Stone walled site. Multiple ephemeral packed stone walls and Terracing
HCAC 15	30° 09' 25.2539" E	25° 02' 08.3509" S	Partial Stone walled site. Sections of ephemeral packed stone walling and terracing. Terrace wall situated between and ridge and natural outcrop in a fairly straight line.
HCAC 16	30° 09' 15.5268" E	25° 02' 19.4785" S	Multiple ephemeral packed stone walls and terraces built between a ridge and natural outcrop.
HCAC 18	30° 09' 20.6028" E	25° 02' 34.8468" S	Portion of small enclosure with Ephemeral packed stone walling. 5mX5m
HCAC 26	30° 10' 00.8219" E	25° 02' 29.5943" S	DW 17 Ephemeral wall
HCAC 27	30° 09' 58.7951" E	25° 02' 38.9256" S	Ephemeral wall – Linear Impacted by Haul road
HCAC 28	30° 09' 56.7685" E	25° 02' 41.3341" S	Ephemeral wall Impacted by Haul road.
HCAC 30	30° 09' 51.2423" E	25° 03' 31.4099" S	Rectangular stone wall feature. Low impact
DW005	30.164266	25.055054	Stone walling on rise, some terraced walling. Associated communal grinding area to the south of the stone walls. Close to site DW003.
DW010	30.167163	25.051430	Stone walling at the base of a rise. Some terracing. Potsherds and an upper grindstone noted at the site.
DW011	30.165325	25.048595	Some walling, some terracing on the northern side. Possible communal grinding area associated with stone walling.
DW013	30.165876	25.048023	Stone Walling with possible communal grinding area in close proximity.
DW014	30.165699	25.046040	Stone walling around natural boulders. Walls are large and well preserved, with an enclosure approximately 15 m in diameter.
DW015	30.166371	25.042680	Stone walling associated with a rise. Communal grinding area in close proximity. Potsherds.
DW018	30.166973	25.042140	Stone Walling - natural boulders packed with stone. Not substantial.

DW019	30.166055	25.040141	Substantial stone walling, large and well preserved. Enclosure of approximately 15 m diameter with a clearly defined entrance.
DW020	30.167313	25.039673	Stone walling. Not extensive.
DW021	30.170636	25.039384	Stone walling. Not extensive and not well preserved.
DW022	30.168057	25.037975	Stone walling - double walling, straight and approximately 10 m long.
DW024	30.165903	25.037968	Stone walling - enclosure approximately 5 m in diameter.
DW026	30.166388	25.037972	Stone walling collapsed and not extensive or well preserved.
DW027	30.166986	25.038111	Stone walling. Straight and approximately 20 m long. Enclosure with entrance. Next to communal grinding area.
DW028	30.167338	25.038549	Stone walling. Straight and approximately 20 m long. Enclosure with entrance. Next to communal grinding area.
DW030	30.155789	25.058287	Stone foundations
DW032	30.155610	25.053214	Stone walling. Single stone wall. Possibly for erosion gully.
DW049	30.167576	25.037139	Stone walling. Single L-shaped wall.

8.2 Archaeological Features

Circular stone walled enclosures associated with Late Iron Age settlements were recorded, possibly forming part of Ndebele settlements in the larger area, although the Du Piesanie & Higgitt (2012) report mentions Badfontein type walling at DW001. Grinding sites/ surfaces possibly dating to the Iron Age were recorded as well. A few MSA artefacts on Hornfells were recorded in an erosion gully and are out of context and of low significance. Archaeological features and sites in the study area are indicated in Table 10.

Table 10. Archaeological sites and find spots in the study area.

Feature Number	Longitude	Latitude	Description
HCAC 19	30° 09' 20.8547" E	25° 02' 41.4455" S	Medium sized site: Possibly Iron age. Multiple packed stone enclosures and ephemeral packed stone walls. Some of the enclosures are circular. Site also contains terraces. 50mX50m The entire site is situated fairly high on the shoulder of the hill between two large rocky outcrops.
HCAC 22/ DW033	30.153780	25.053214	Findspot in erosion gully. MSA and LSA tools identified. Single potsherd with notch identified.
HCAC 23	30° 09' 19.0225" E	25° 03' 09.3204" S	Multiple stone artefacts located within an erosion gully. • 3 x Miscellaneous Flakes
HCAC 29/ DW 3	30° 09' 54.5220" E	25° 03' 15.7896" S	Stone walling on rise along road. Used natural boulders in the walling. Potsherds were noted on the site, decorated and undecorated.
DW001	30.164024	25.057954	Extensive stone walled site, with terraced walling. Possibly Badfontein type walling with communal grinding area. Decorated potsherds found scattered between walling. Located next to current homestead and road.
DW004	30.164651	25.05525	Stone walling on rise, some terraced walling. Associated communal grinding area to the south of the stone walls. Close to site DW003.
DW006	30.165661	25.053150	Stone features, including walling, circles and mounds. Potsherds noted at site.
DW016	30.165876	25.041617	Single findspot of MSA flake and potsherd on open, exposed rock surface.
DW017	30.166058	25.041541	Grinding surface area. Single MSA faceted quartzite flake identified.
DW031	30.156233	25.054522	Grinding surface area.
DW041	30.165339	25.039962	Grinding surface with 6 large, well defined grinding stone.
DW045	30.164514	25.038680	Single findspot. Large lower grindstone.
DW046	30.164840	25.052530	Lower grinding stone.



Figure 8-8: Ephemeral terracing.



Figure 8-9: Stone wall enclosure.

8.3 Burial Sites

Numerous burial sites were recorded throughout the project area (Figure 8-10), ranging from stone packed features to formal graves with granite grave dressing and headstone and are described in Table 11. Graves are always of high social significance.

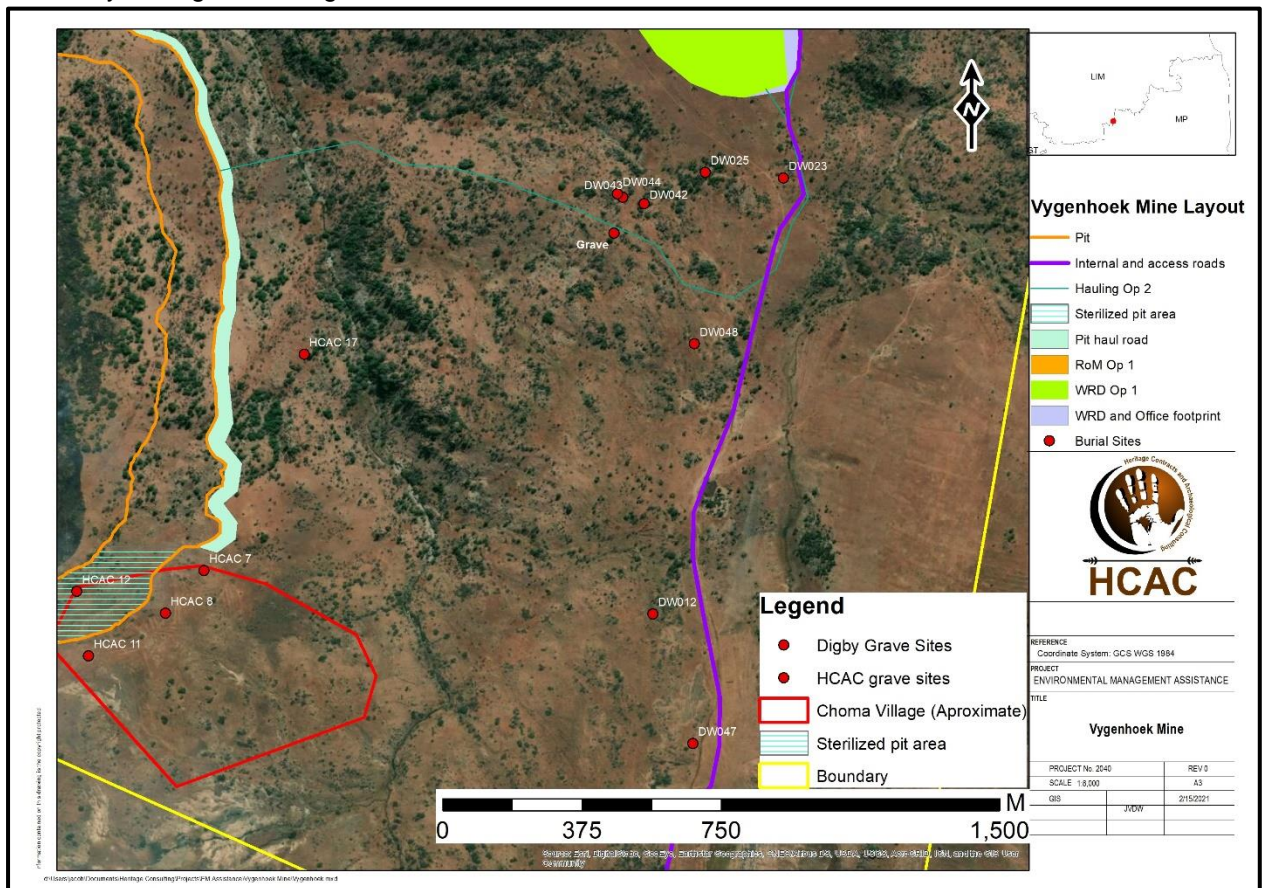


Figure 8-10: Burial sites in relation to the development layout.

Table 11. Graves and burial sites in the study area.

Number	LONGITUDE	LATITUDE	Type site	Description
HCAC 7	30° 09' 13.2875" E	25° 02' 50.8920" S	Choma Village - Graves with Granite headstones	Cemetery - 2 graves with inscriptions of Makgaleh Cho mapelego date is not discernable

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				18- 8 - 1941. Choma Mathale Moruti Passed away in 1963.
HCAC 8	30° 09' 09.9577" E	25° 02' 54.6253" S	Choma Village - Graves with Granite headstones	Approximately 8 graves with two headstones including the Grave of Choma Mogalagadi Ngwatladi no dates.
HCAC 11	30° 09' 03.2293" E	25° 02' 58.3295" S	Choma Village - Burial site	7 Stone packed graves possibly of children. One grave has a formal headstone of Matupe Lucas. Passed away in 1978.
HCAC 12	30° 09' 02.2212" E	25° 02' 52.7315" S	Choma Village - Burial site	2 Graves located in a cattle kraal. One is a stone packed grave the other has a cement headstone with the inscription Choma on it.
HCAC 17	30° 09' 22.0355" E	25° 02' 32.0641" S	Burial site	2 x Graves. • Cement gravestone + packed stone Skirting with cement on top, MOHLAHO Date: 19— (weathered) • Metal grave marker, packed stone skirt with no fill. THAPA no date
DW012	30.164567	25.048521	Burial Site	Single burial. Name on headstone: Moraka Phillimon Lekgeu. Rising sun image on headstone.
DW023	30.167733	25.037968	Burial site	Burial site. 5 graves with no formal headstones. Site lies directly next to DW22. Graves have stone surface and are well tended.
DW025	30.165837	25.037831	Burial site	Burial site. 8 graves with formal headstones and grave dressing. Surface grave goods associated with the graves.
DW042	30.164363	25.038591	Burial site	Burial site. Area is fenced off and untended. 5 identified graves with headstones and formal grave dressing, the remainder with stone dressing.
DW043	30.163836	25.038433	Burial site	Burial site. Area is fenced off and also had large stone walling at its entrance. It is tended. 12 grave sites were identified, 7 with headstones and formal dressing. The remainder with stone dressing. 1 Lower grind stone identified.
DW044	30.163710	25.038350	Burial site	Burial site. Area is fenced off and also had large stone walling at its entrance. It is tended. 12 grave sites were identified, 7 with headstones and formal dressing. The remainder with stone dressing. 1 Lower grind stone identified.
DW047	30.165536	25.051657	Possible Burial site	Single monolith. Possible headstone. No other feature identified.
DW048	30.165573	25.041986	Possible Burial site	Possible single burial site.
Possible Burial Site	25° 02' 21.4872" S,	30° 09' 49.0752" E	Possible Burial Site	Site conditions to be confirmed



Figure 8-11: Formal grave with granite headstone at HCAC 005.



Figure 8-12: General site conditions at HCAC 005.



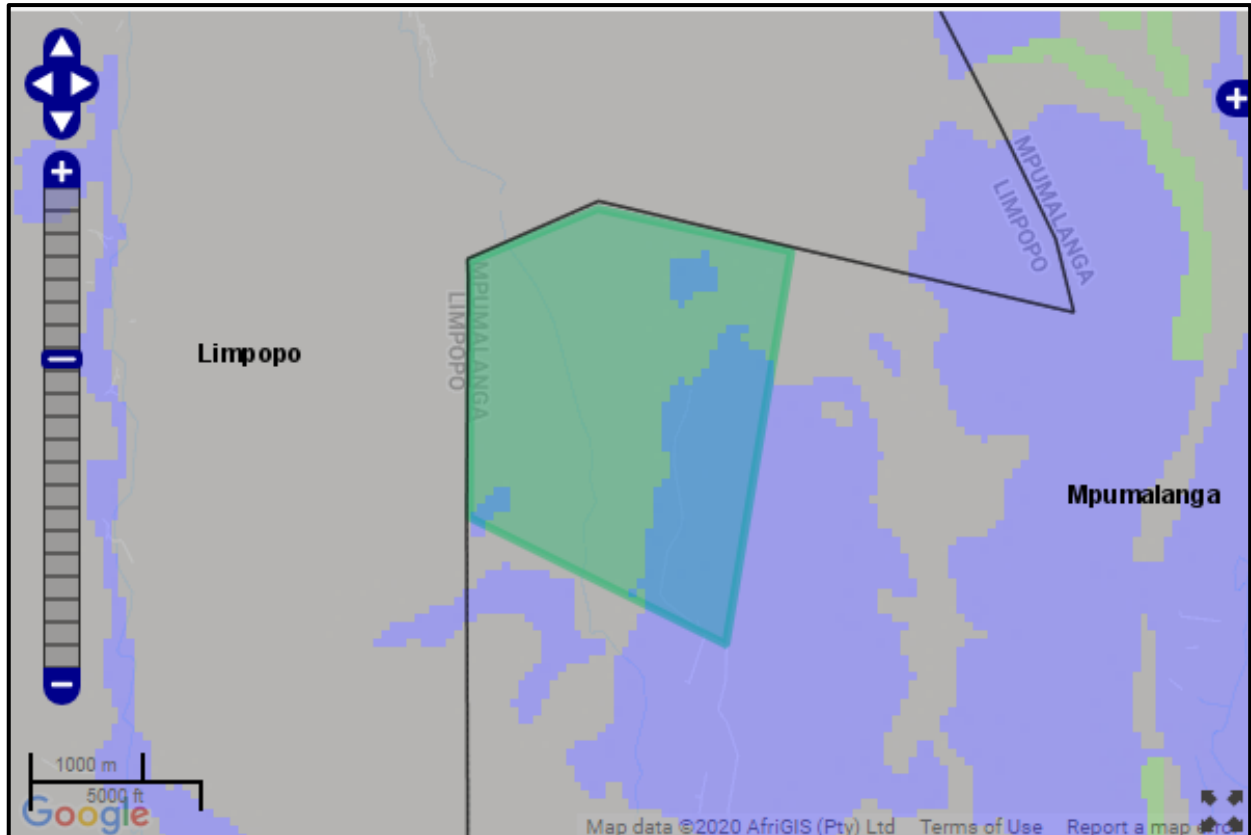
Figure 8-13: Graves within a cattle kraal at HCAC 11.



Figure 8-14: Graves within a cattle kraal at HCAC 12.

8.4 Paleontological Heritage

Based on the SAHRA Paleontological map the area (Fig 8-15) is of low and insignificant paleontological sensitivity and no further studies are required.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No paleontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 8-15. Paleontological Sensitivity of the study area (green polygon) is indicated as insignificant and low.

A Palaeontological Desktop Study for the area was conducted by Karodia (2012) who recommended a fossil chance find procedure. The main bedrock units to be impacted by the proposed mine are the Bushveld Complex, the Dwars River Layered Sub-Suite, the Vlakfontein Layered Sub-Suite and Kolobeng Norite. Overall, the geological layers have a low sensitivity for palaeontological heritage resources.

9 Potential Impact

9.1 Original Layout

The study area is characterized by extensive stone walled settlements including numerous burial sites and intangible heritage sites and the overall impact of the original layout on heritage resources is high (Table 12 and Figure 9-1). Any direct impacts that could occur would be during the construction and operation phases and would be of low to high significance depending on the type of site. The Choma Village and associated features is of medium to high significance and impacts to this area would be medium to high. Impacts to burial sites would be of high social significance and several burial sites occur in the initial layout.

9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase:

Both direct and indirect impacts to heritage features can occur during the operation phase.

Table 12. Features that will be impacted on by the development and proposed mitigation measures.

New Number	LONGITUDE	LATITUDE	Description	Impact	Significance	Mitigation Measures
HCAC 1	30° 09' 09.3059" E	25° 02' 12.7860" S	Ephemeral partly disturbed walling	New Pit	Low Significance	Record the site prior to destruction. Apply for a destruction permit
HCAC 6	30° 09' 13.3273" E	25° 02' 50.8920" S	Rectangular stone walled kraal.	Haul Road	Medium Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.
HCAC 7	30° 09' 13.2875" E	25° 02' 50.8920" S	Cemetery - 2 graves with inscriptions of Makgaleh Cho mapelego date is not discernible 18- 8 - 1941. Choma Mathale Moruti Passed away in 1963.	Haul Road	High Social Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.

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HCAC 8	30° 09' 09.9577" E	25° 02' 54.6253" S	Approximately 8 graves with two headstones including the Grave of Choma Mogalagadi Ngwatladi no dates.	Haul Road	High Social Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.
HCAC 10/ DW039	30.149830	25.049115	Stone walling. Large, well preserved circular stone walling. Lower grindstone identified.	New Pit	Medium High Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.
HCAC 11	30° 09' 03.2293" E	25° 02' 58.3295" S	7 Stone packed graves possibly of children. One grave has a formal headstone of Matupe Lucas. Passed away in 1978.	Haul Road	High Social Significance	Retain Site in Situ with an adequate buffer zone and safe access for family members.
HCAC 12	30° 09' 02.2212" E	25° 02' 52.7315" S	2 Graves located in a cattle kraal. One is a stone packed grave the other has a cement headstone with the inscription Choma on it.	New Pit	High Social Significance	Retain Site in Situ with an adequate buffer zone and safe access for family members.
HCAC 14	30° 09' 27.4751" E	25° 02' 04.3657" S	Stone walled site. Multiple ephemeral packed stone walls and Terracing	Haul Road	Low Significance	Adjust planned haul road to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
HCAC 15	30° 09' 25.2539" E	25° 02' 08.3509" S	Partial Stone walled site. Sections of ephemeral packed stone walling and terracing. Terrace wall situated between and ridge and natural outcrop in a fairly straight line.	River Crossing	Low to medium significance	Adjust lay out to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
HCAC 16	30° 09' 15.5268" E	25° 02' 19.4785" S	Multiple ephemeral packed stone walls and terraces built between a ridge and natural outcrop.	Edge of temporary waste stock piles	Low Significance	Adjust lay out to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.

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HCAC 20	30° 08' 59.1539" E	25° 03' 02.7251" S	Extent of Large historical site.	Stock Yard	Medium Significance	Record the site prior to destruction. Apply for a destruction permit
HCAC 21/ DW035	30.152708	25.051990	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.	temporary waste Stock Piles	Low Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.
HCAC 22/ DW033	30.153780	25.053214	Findspot in erosion gully. MSA and LSA tools identified. Single potsherd with notch identified.	Temporary waste Stock Piles	Low Significance	Adjust planned haul road to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
HCAC 23	30° 09' 19.0225" E	25° 03' 09.3204" S	Multiple stone artefacts located within an erosion gully. • 3 x Misc Flakes	Temporary waste Stock Piles	Low Significance	No mitigation is required.
HCAC 24	30° 09' 14.5693" E	25° 03' 01.4689" S	Stone walled feature. Ephemeral packed stone walls. Possibly rectangular.	Temporary waste Stock Piles	Low Significance	Record the site prior to destruction. Apply for a destruction permit
HCAC 25	30° 09' 11.1312" E	25° 03' 01.8289" S	Portion of an ephemeral packed stone wall.	Temporary waste Stock Piles	Low Significance	Record the site prior to destruction. Apply for a destruction permit
HCAC 26	30° 10' 00.8219" E	25° 02' 29.5943" S	DW 17 Ephemeral wall	Haul Road	Low significance	Record the site prior to destruction. Apply for a destruction permit
HCAC 27	30° 09' 58.7951" E	25° 02' 38.9256" S	Ephemeral wall – Linear Impacted by Haul road	Haul Road	Low significance	Record the site prior to destruction. Apply for a destruction permit
DW004	30.164651	25.05525	Stone walling on rise, some terraced walling. Associated communal grinding areato the south of the stone walls. Close to site DW003.	Haul Road	Low to medium significance	Adjust planned haul road to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
DW024	30.165903	25.037968	Stone walling - enclosure approximately 5 m in diameter.	Close to Haul Road	Low to medium significance	Adjust lay out to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.

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DW025	30.165837	25.037831	Burial site. 8 graves with formal headstones and grave dressing. Surface grave goods associated with the graves.	Close to Haul Road	Medium High Significance	Retain Site in Situ with an adequate buffer zone and safe access for family members.
DW029	30.162264	25.033053	Recent homestead - old fencing found. Cleared area and tomato plants growing. No other physical structures identified.	Close to Haul Road	Low significance	Monitor during construction
DW034	30.153147	25.052452	Stone walling. Stone enclosures, one approximately 15 m in diameter. Possibly associated with Choma Village to the north.	Temporary waste Stock Piles	Medium High Significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.
DW036	30.152679	25.050468	Stone walling. Stone wall foundations with communal grinding area. Rectangular in shape.	Temporary waste Stock Piles	Low to medium significance	Adjust Lay out to exclude the site. Mitigation - Test excavations and mapping of the site. Apply for a destruction permit.
DW037	30.152018	25.049819	Stone walling - scatter of small stone walls in front of Choma village. Lower grindstone and potsherds found in wash around stone walls. Associated with larger Choma Village.	Haul Road	Low to medium significance	Adjust Mine plant to exclude the site. Preservation of the site. Heritage Mitigation Conservation and Heritage Management plan. Nomination of the site as Regional Heritage Site with SAHRA.

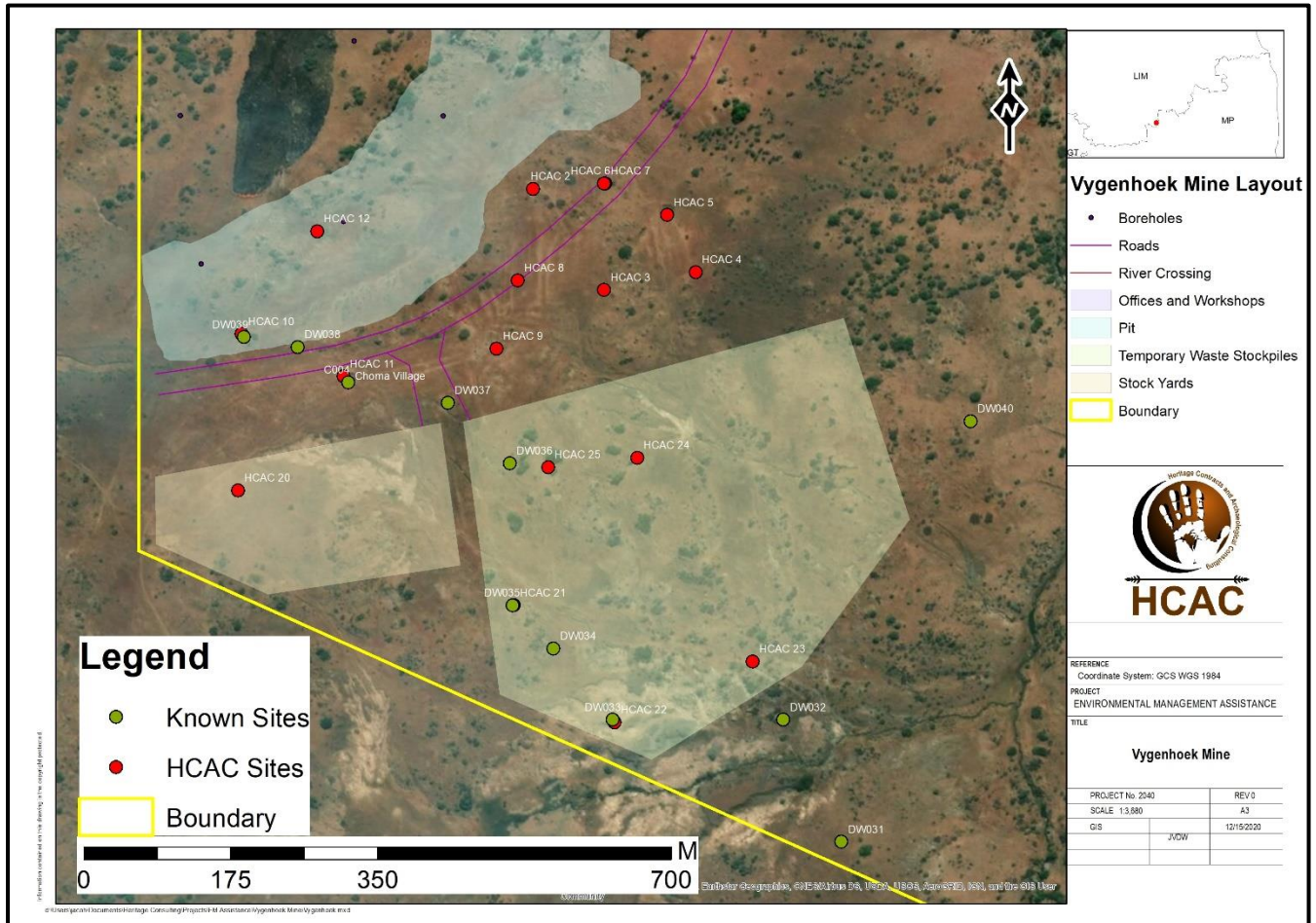


Figure 9-1. Recorded sites in relation to the proposed mine layout.

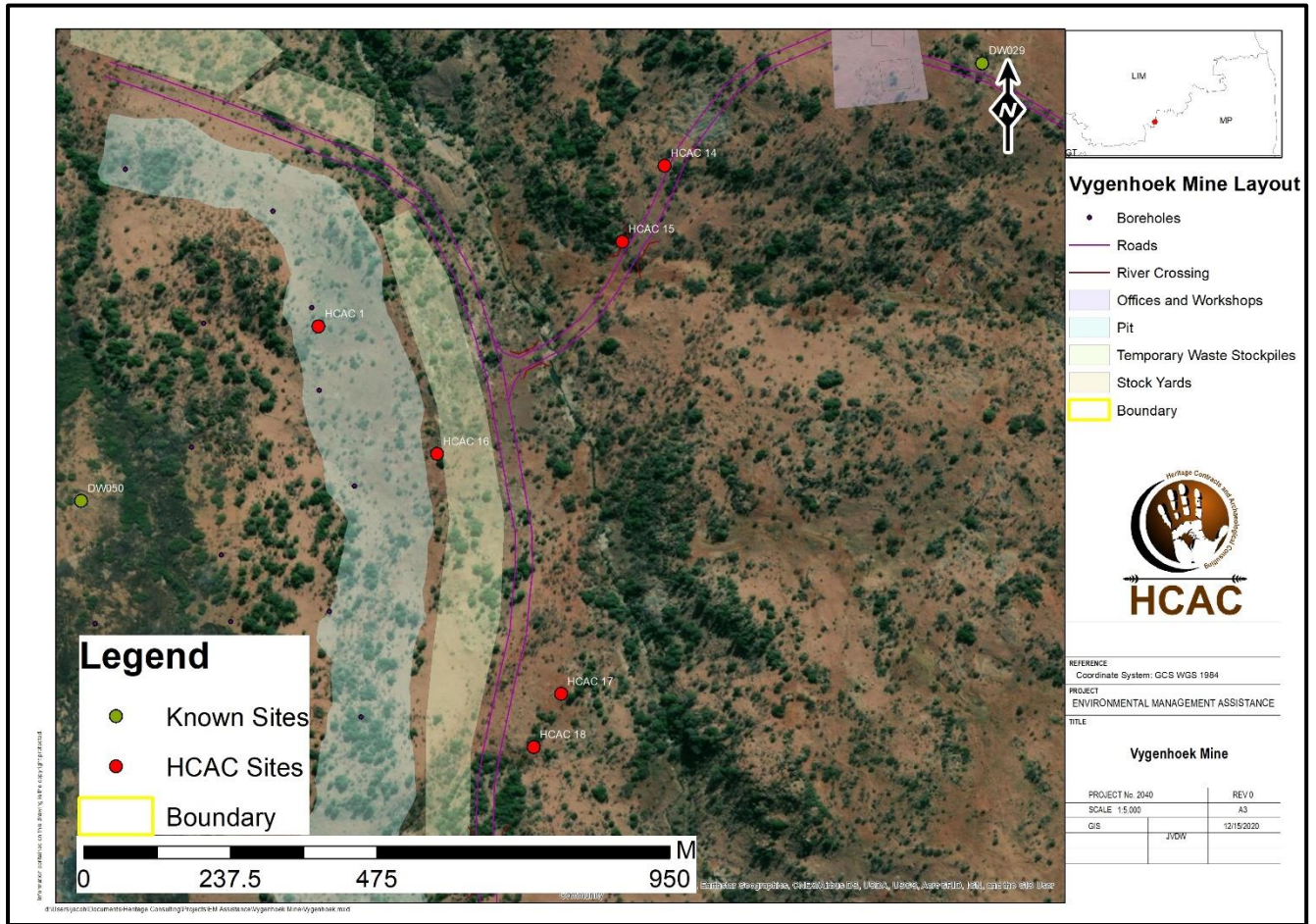


Figure 9-2. Recorded sites in relation to the pit and waste stockpiles.

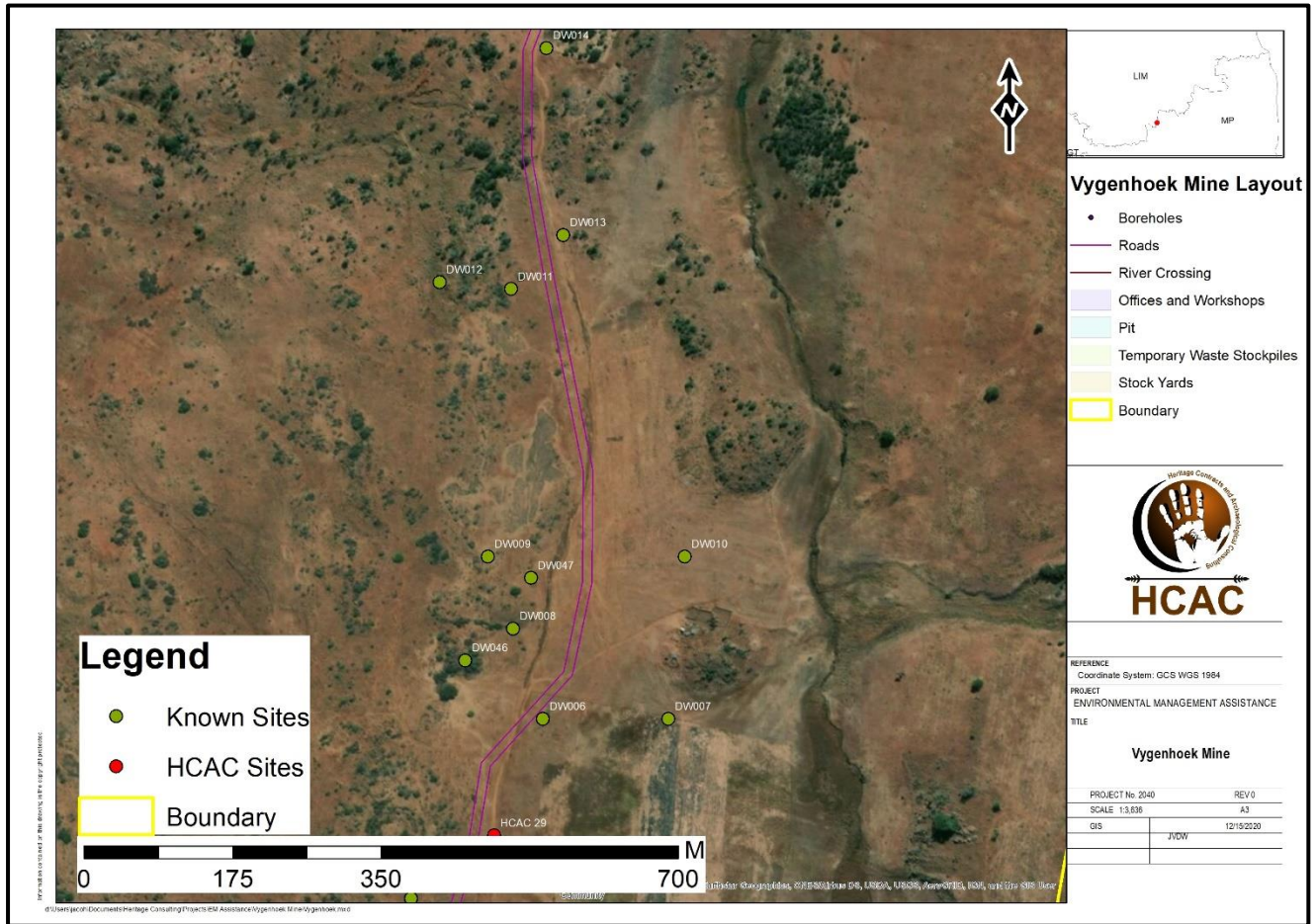


Figure 9-4. Recorded sites in relation to the proposed haul road.

Table 13. Impact Assessment table Choma Village Sites (HCAC 6, HCAC 20, HCAC 24, HCAC 25, HCAC 21/ DW035, DW034, DW036, DW037)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Regional (4)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (4)
Probability	Definite (5)	Improbable (2)
Significance	75 (High)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Adjust Mine lay out to preserve the site. • Conservation and Heritage Management plan (as per SAHRA guidelines. • Monitoring during construction. 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

Table 14. Impact assessment on stone walled features (Historical/ Recent) - (HCAC 1, HCAC 10/ DW039, HCAC 14, HCAC 15, HCAC 16, HCAC 26, HCAC 27, DW024, DW029)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low to Moderate (4)	Low (2)
Probability	Definite (5)	Improbable (2)
Significance	55 (Medium to High)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
<p>Mitigation:</p> <ul style="list-style-type: none"> • Adjust lay out to retain the sites <i>in situ</i> as far as feasible. • If not possible heritage mitigation that include surface collection, photographs and mapping • Monitoring during construction • Apply for a destruction permit. 		
<p>Cumulative impacts:</p> <p>The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.</p>		
<p>Residual Impacts:</p> <p>Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.</p>		

Table 15. Impact assessment on archaeological site (DW004)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low to Moderate (4)	Low (2)
Probability	Definite (5)	Improbable (2)
Significance	55 (High)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: <ul style="list-style-type: none"> • Adjust lay out to retain the site as far as feasible. • If not possible heritage mitigation that include surface collection, photographs and mapping • Monitoring during construction • Apply for a destruction permit. 		
Cumulative impacts: The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

Table 16. Impact Assessment on archaeological findspots (HCAC 22/ DW033, HCAC 23)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Improbable (2)
Significance	27 (Low)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: The recorded features are out of context and of low significance and is sufficiently recorded in this report. No additional mitigation required.		
Cumulative impacts: The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

Table 17. Impact assessment on burial sites (HCAC 7, HCAC 8, HCAC 11, HCAC 12, DW025)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Regional *Especially Royal graves (4)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (4)
Probability	Definite (5)	Improbable (2)
Significance	75 (High)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Adjust Mine lay out to preserve the sites in-situ with adequate buffer zones. • Ensure access to the sites for family members. 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

9.2 Alternative Layout

After completion of the field surveys the various heritage and environmental sensitivities associated with the project necessitated the consideration of alternative layouts. Several alternatives were proposed by the EAP and based on specialist inputs one alternative was identified as the preferred layout illustrated in Figure 9-5. Note that no additional field work was conducted on the preferred layout and track logs and observations in the report was completed based on the original lay out provided.

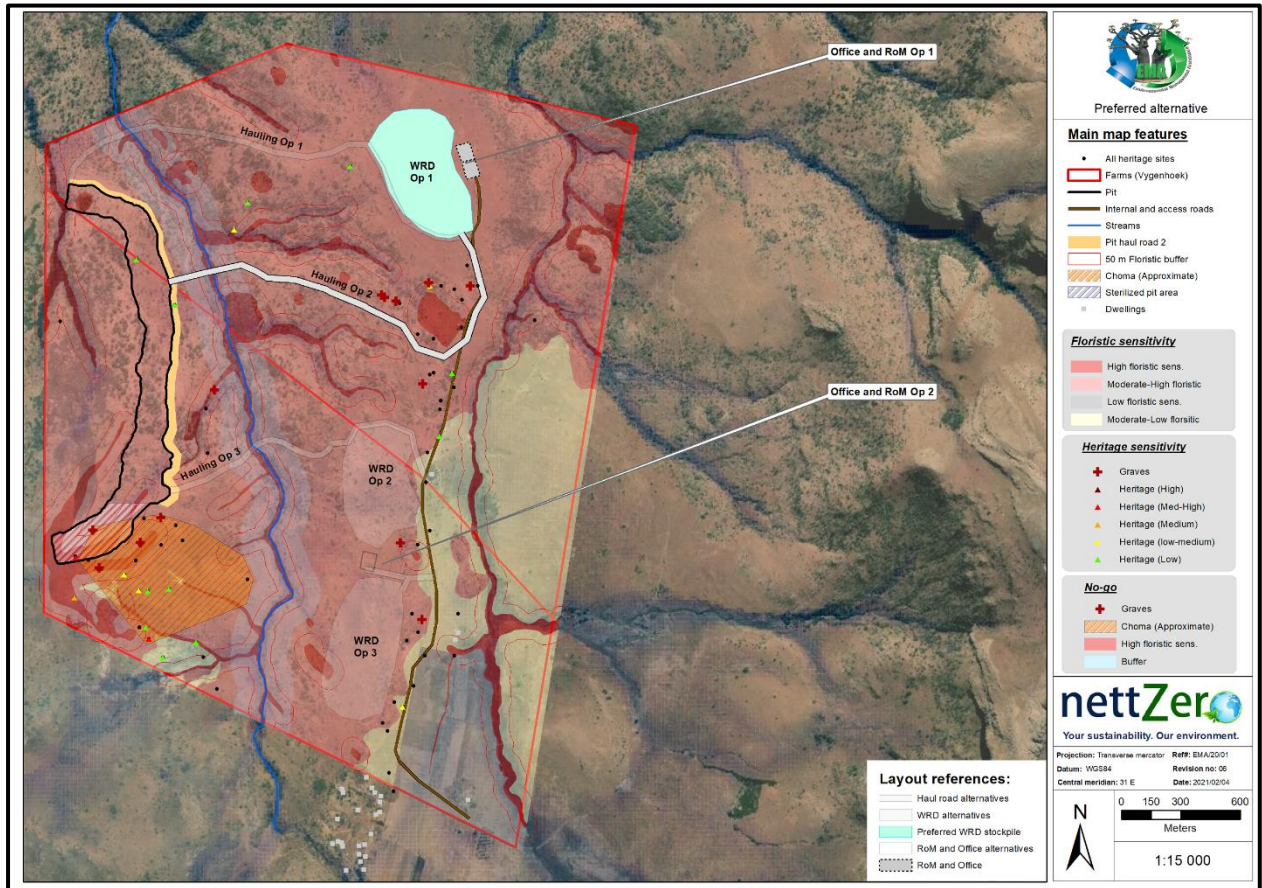


Figure 9-5: Proposed alternatives (shaded) with the preferred alternative (highlighted).

The overall potential impact of the project on heritage resources is Medium. Based on the revised layout (Figure 9-5) the direct impact to significant heritage resources, including the Choma Village and burial sites can be avoided and the features can be preserved minimising the impact of the project. There is still an impact to some of the recorded heritage sites (Table 18) of low and low to medium significance with potential impact on two sites of medium to high significance and the mitigation measures provided in this report will ensure that the impact is mitigated to an acceptable level. Impacts on sites were accounted for sites within 30 m of the impact areas. It should be noted that the indirect & secondary impacts to the recorded features will also require mitigation (Table 18, 19, 20 and 21) for instance the indirect impact to the heritage character and sense of place of the Choma Village with the pit 50 m away.

9.2.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources if any occur.

9.2.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.2.3 Operation Phase:

Both direct and indirect impacts to Heritage Features can occur during the operation phase.

Table 18. Heritage feature that will be impacted on by the Alternative Layout.

Number	Longitude	Latitude	Type Site	Description	Alternative Impact	Direct/ Indirect	Mitigation Measures
HCAC 1	30° 09' 09.3059" E	25° 02' 12.7860" S	Stone walling	Ephemeral partly disturbed walling	Pit	Direct	Record the site prior to destruction. Apply for a destruction permit
HCAC 13	30° 09' 58.8349" E	25° 02' 34.9727" S	Stone walling	Rectangular wall next to rocky outcrop	30 m west of New Access Road	Indirect	Site should be monitored during construction. The area should be demarcated and indicated on development plans. Record the extent of the site and determine level of impact and if required application for destruction permit from SAHRA.
HCAC 16	30° 09' 15.5268" E	25° 02' 19.4785" S	Stone walling	Multiple ephemeral packed stone walls and terraces built between a ridge and natural outcrop.	Pit Haul Road	Direct	Adjust lay out to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
HCAC 27	30° 09' 58.7951" E	25° 02' 38.9256" S	Stone walling	Ephemeral wall – Linear Impacted by Haul road	On Existing Access Road	Direct	Record the site prior to destruction. Apply for a destruction permit
HCAC 28	30° 09' 56.7685" E	25° 02' 41.3341" S	Stone walling	Ephemeral wall Impacted by Haul road.	25 m east of Existing Access Road	Indirect	Site should be monitored during construction. The area should be demarcated and indicated on development plans. Record the extent of the site and determine level of impact and if required application for destruction permit from SAHRA.
DW004	30.164651	25.05525	Iron Age	Stone walling on rise, some terraced walling. Associated communal grinding areato the south of the stone walls. Close to site DW003.	11 m west of existing Road	Probable Direct Impact	Adjust planned haul road to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.

DW006	30.165661	25.053150	Iron Age	Stone features, including walling, circles and mounds. Potsherds noted at site.	11 m east of the existing access road	Probable Direct Impact	Adjust planned haul road to retain the site as far as feasible. Heritage Mitigation Document the extent of the site through surface collection, photographs and mapping. Apply for a destruction Permit.
DW013	30.165876	25.048023	Stone walling	Stone Walling with possible communal grinding area in close proximity.	19 m East of Existing Access Road	Probable Direct Impact	Record the site prior to destruction. Apply for a destruction permit
DW014	30.165699	25.046040	Stone walling	Stone walling around natural boulders. Walls are large and well preserved, with an enclosure approximately 15 m in diameter.	14 m East of Existing Access Road	Probable Direct Impact	Record the site prior to destruction. Apply for a destruction permit
DW018	30.166973	25.042140	Stone Walling	Stone Walling - natural boulders packed with stone. Not substantial.	10 m east of new access road	Probable Direct Impact	Record the site prior to destruction. Apply for a destruction permit
DW020	30.167313	25.039673	Stone walling	Stone walling. Not extensive.	18 m West of New Access Road	Probable Direct Impact	Record the site prior to destruction. Apply for a destruction permit
DW022	30.168057	25.037975	Stone walling	Stone walling - double walling, straight and approximately 10 m long.	10 m west of Access Road	Probable Direct Impact	Record the site prior to destruction. Apply for a destruction permit
Possible Grave	25° 02' 21.4872" S,	30° 09' 49.0752" E	Burial site	Possible Burila Site	Hauling option 2 (20 m south)	Probable Direct Impact	Confirm that the site is a grave, if so possible micro adjustment of the haul road to retain site in Situ with an adequate buffer zone and safe access for family members

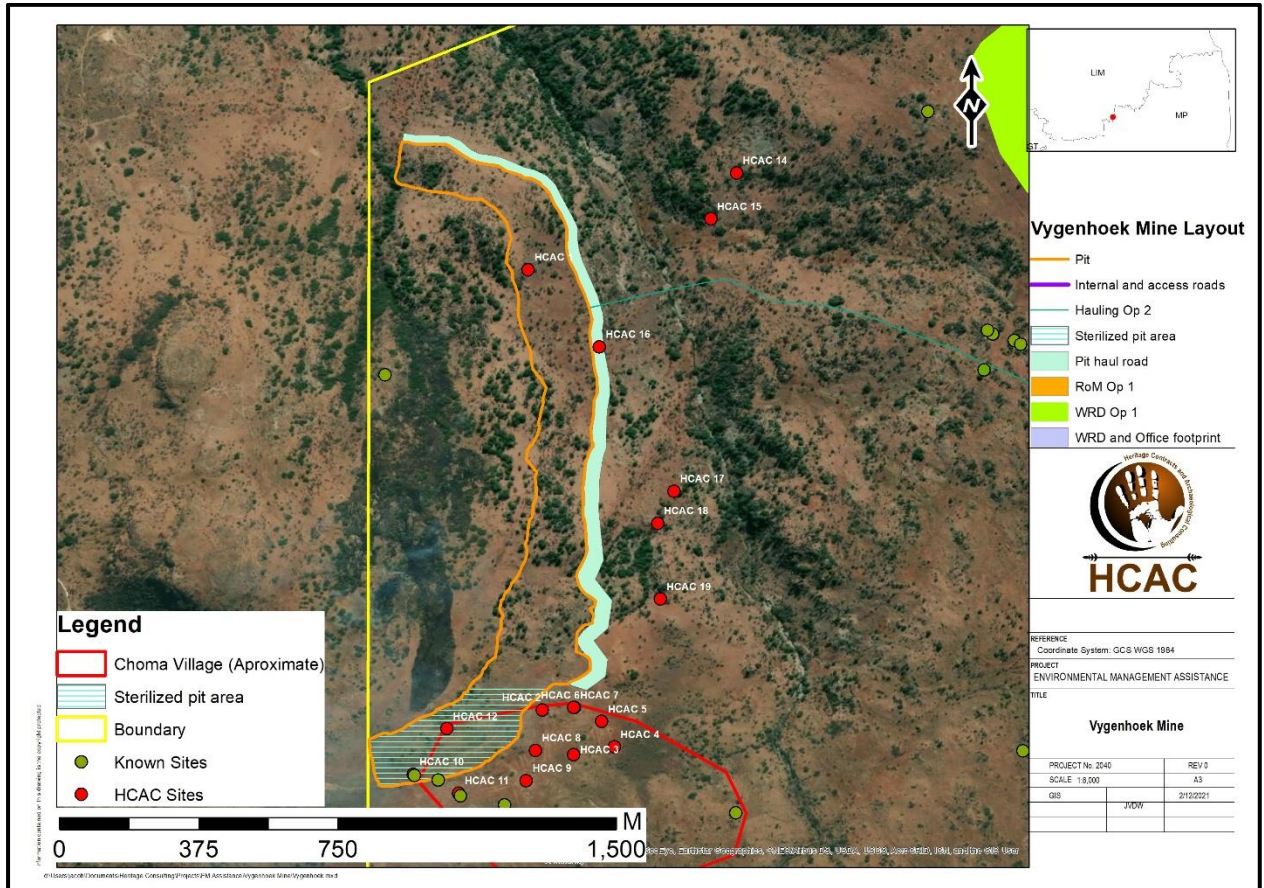


Figure 9-6. Recorded features in relation to the pit in the alternative layout.

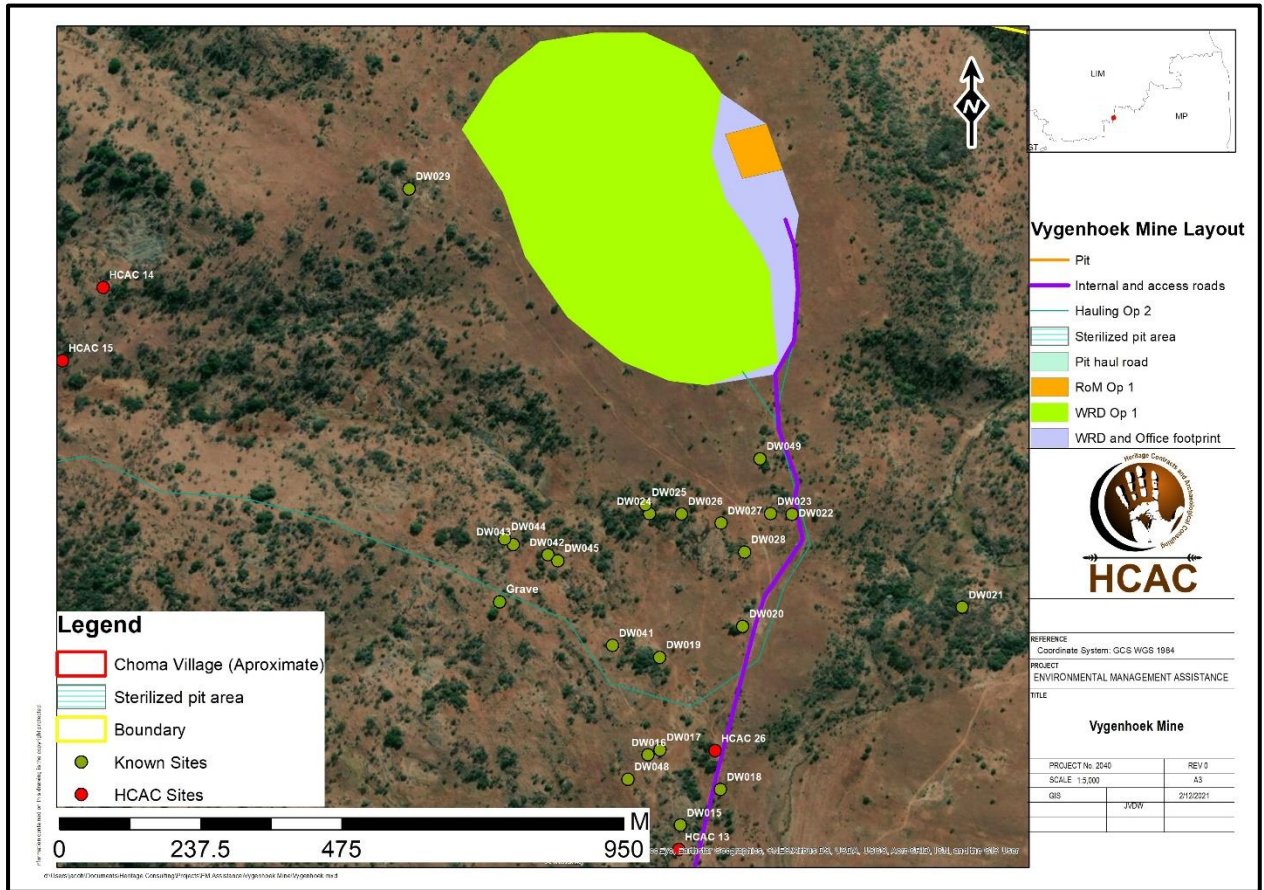


Figure 9-7. Heritage features in relation to the alternative hauling Op 2.

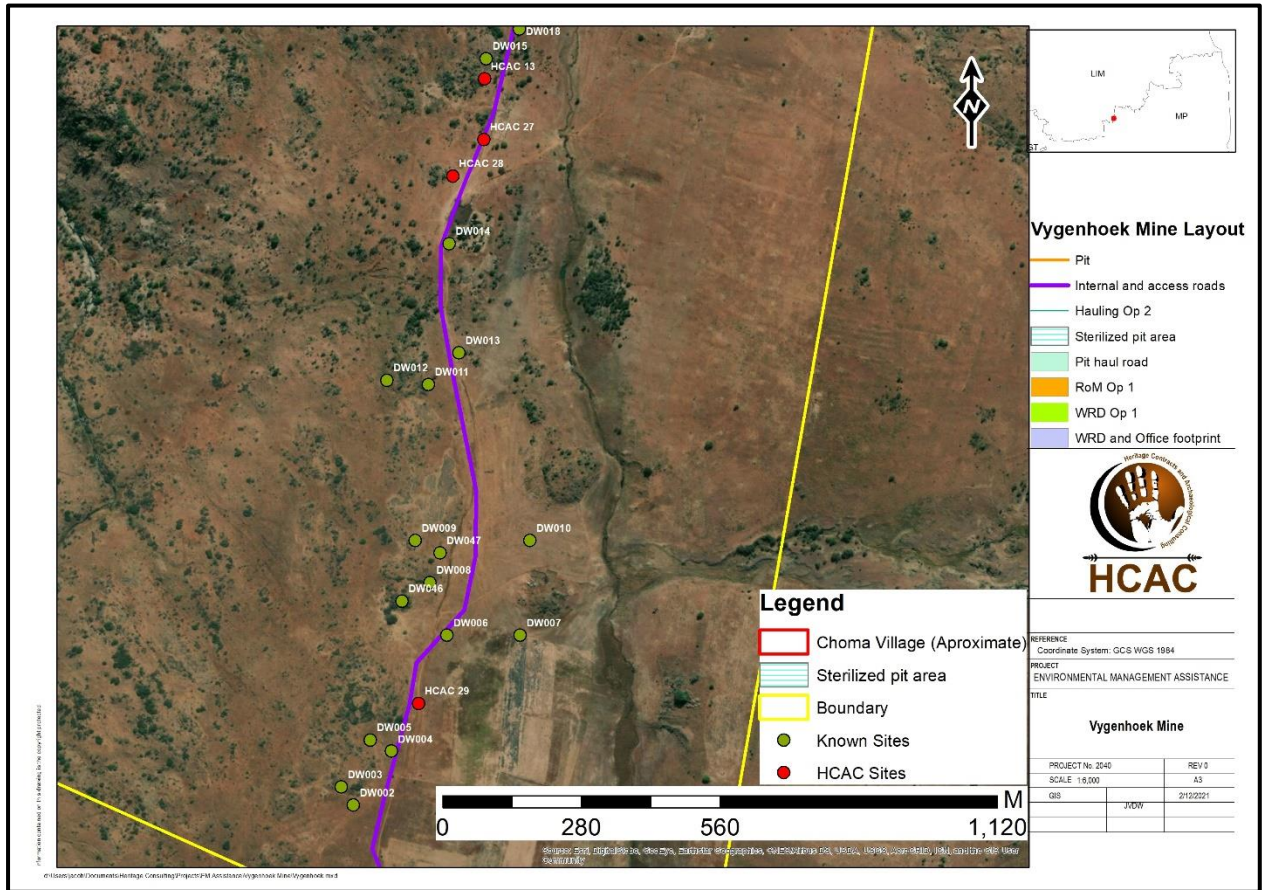


Figure 9-8. Heritage features in relation to the access road.

Table 19. Impacts on Choma Village

Nature: The construction and operation will have an indirect impact on the sense of place of the Choma Village and a visual impact is also expected on the area.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Regional (4)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (4)
Probability	Probable (3)	Improbable (2)
Significance	45 (Medium)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Consultation with the Choma representatives and SAHRA to ensure acceptable conservation thresholds and an adequate buffer around the site. • Consultation with Choma representatives regarding intangible heritage features and unrecorded heritage features including graves; • Conservation and Heritage Management plan (as per SAHRA guidelines). • Monitoring during construction. 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will directly and indirectly impact on heritage resources and therefore the cumulative impact is medium to high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified. It should also be noted that the presence of the mine will have a visual impact as well as an impact on the sense of place of the area.		

Table 20. Impact assessment on stone walled features HCAC 1, HCAC 13, HCAC 16, HCAC 27, HCAC 28, DW013, DW014 , DW018, DW020, DW022

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low to Moderate (4)	Low (2)
Probability	Definite (5)	Improbable (2)
Significance	55 (Medium)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Adjust lay out to retain the sites <i>in situ</i> as far as feasible. • If not possible heritage mitigation that include surface collection, photographs and mapping; • Monitoring during construction; • Apply for a destruction permit. 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on heritage resources and therefore the cumulative impact is high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

Table 21. Impact assessment on archaeological site (DW004 and DW006)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low to Moderate (4)	Low (2)
Probability	Definite (5)	Improbable (2)
Significance	55 (Medium)	16 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> • Adjust lay out to retain the site as far as feasible. • If not possible heritage mitigation that include surface collection, photographs and mapping • Monitoring during construction • Apply for a destruction permit. 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on significant heritage resources and therefore the cumulative impact is high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

Table 22. Impact assessment on possible burial sites (New identified possible burial site)

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Regional *Especially Royal graves (4)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (4)
Probability	Definite (5)	Improbable (2)
Significance	75 (High)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation:		
<ul style="list-style-type: none"> Confirm that the site is a grave, if so possible micro adjustment of the haul road to retain site <i>in situ</i> with an adequate buffer zone and safe access for family members 		
Cumulative impacts:		
The greater study area has been impacted on by various mining developments and the development as per the current lay out will impact on heritage resources and therefore the cumulative impact is high.		
Residual Impacts:		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on but this cannot be quantified.		

10 Conclusion and recommendations

In anticipation of other mining activities in the greater study area, archaeologists have completed numerous heritage surveys (e.g., Huffman & Schoeman 2001, 2002 a and b; van Schalkwyk 2005; Roodt 2003a, 2003b, 2003c, 2005, 2008a, 2008b; Van der Walt & Fourie 2006; Van der Walt & Celliers 2009; Van der Walt 2009; 2016 and Pistorius 2007, 2010, 2011) for various EIA's and EMP's. These studies provide a good understanding of the archaeology of the area and use of the wider landscape and more than 240 sites are on record for the greater study area, ranging from the Middle Stone Age and Iron Age to recent households of farm labourers and tenants. A Heritage assessment by Du Piesanie and Higgitt (2012) that assessed the current study area recorded 50 features in the Vygenhoek project area. The survey design of was to revisit selected sites previously recorded and to assess areas not covered during the previous assessments that could be of interest. Based on these surveys more than 50 heritage features are now on record for the immediate study area. According to the SAHRA Paleontological map the area is of low and insignificant paleontological sensitivity and no further studies are required.

After completion of the field surveys that focused on one layout (referred to as the original layout) the various heritage and environmental sensitivities associated with the project necessitated the consideration of alternative layouts. Several alternatives were proposed by the EAP and based on specialist inputs one alternative was identified as the preferred layout. A comparison between the two layouts are illustrated in Figure 10-1.

Impacts to heritage resources by the Alternative layout is much lower with specific reference to the sterilisation of the Pit to preserve the Choma Village *in situ* and impact rating is now low to medium prior to mitigation versus the previous high. From a heritage perspective the revised preferred layout is also the preferred based on the recommendations and management measures as outlined in Section 10 of this report.

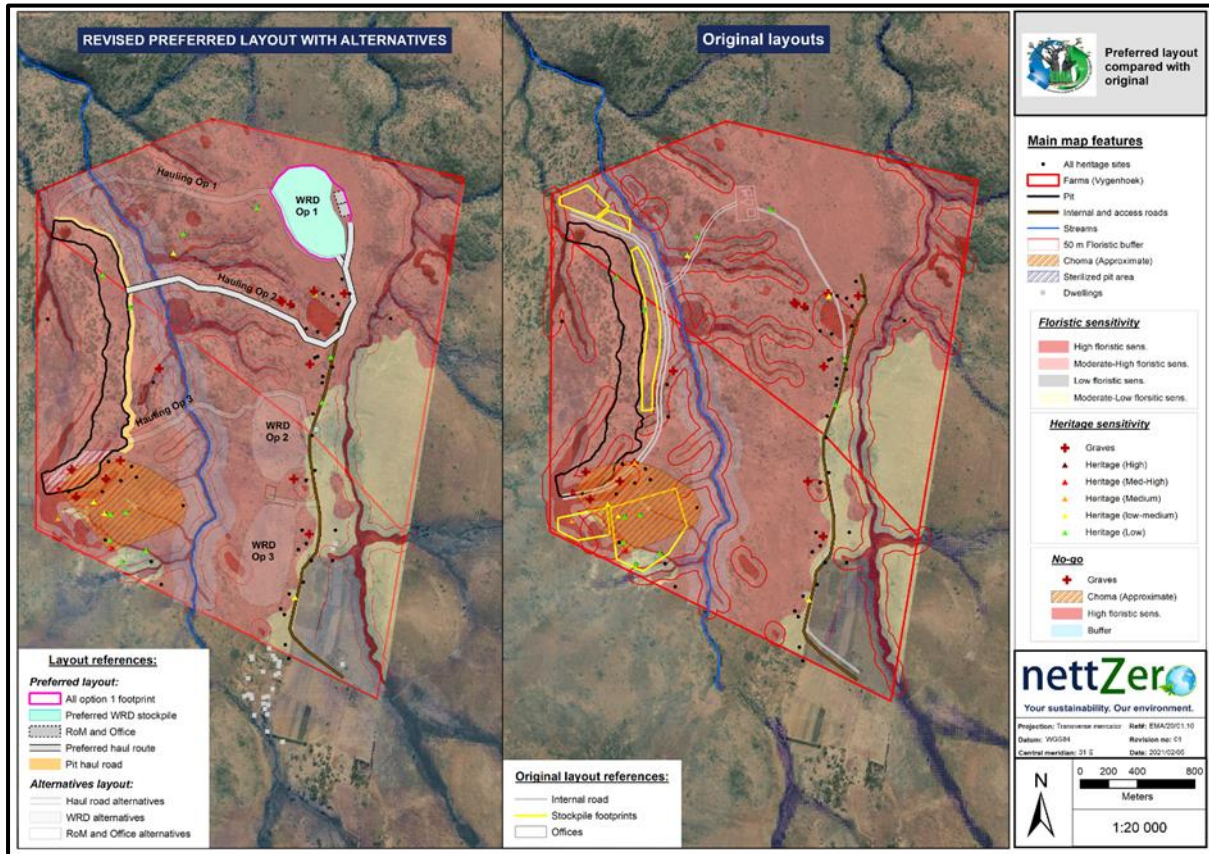


Figure 10-1. Alternative lay out compared to original lay out.

10.1. Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:

- Social consultation with the Choma representatives is required to adequately record intangible and tangible resources that could be impacted on by the proposed project;
- The Choma Village will be preserved based on the preferred alternative layout, however it is recommended that consultations with the Choma representatives should determine conservation thresholds and to ensure that indirect and secondary impacts are acceptable;
- With the preferred alternative, the Mine Plan was amended as far as feasible to avoid damage to the recorded heritage resources. Where this is not possible phase 2 mitigation is recommended based on approval from SAHRA;
- The aerial extent of recorded heritage resources must be mapped in relation to the mine layout to finalise mitigation measures (sites that will require monitoring or phase 2 mitigation);
- Implementation of a site development plan;
- Implementation of a monitoring programme;
- A heritage specialist should assess any material change to the conceptual layout plan and a heritage walkdown of the final layout must be conducted prior to construction. Note that time should be allowed for mitigation if additional sites are identified during the walk down;
- A possible grave site was identified during the mapping process and it should be confirmed whether the site is a grave, if so possible micro adjustment of the haul road to retain site *in-situ* with an adequate buffer zone and safe access for family members is recommended;
- Implementation of a chance find procedure for the project (as outlined below).

10.2. Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

10.3. Reasoned Opinion

The overall impact of the preferred alternative layout on heritage resources is medium and can be mitigated to an acceptable level based on the recommendations in this report and approval from SAHRA prior to development. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.4 Potential risk

- Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as require additional layout changes.
- During the stakeholder consultation process numerous concerns were raised by community members regarding the impact of the project on tangible and intangible resources and it is a risk that the local community can see the project as unacceptable due to the secondary impact on the cultural landscape.

10.5 Monitoring Requirements

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. Day to day monitoring can be conducted by the Environmental Officers (EO). The EO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during construction. The EO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 23. Monitoring requirements for the Vygenhoek Mine.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Clearing activities and Excavations	Entire Mine Lay out	EO	Weekly – during construction phase	Proactively	<ul style="list-style-type: none"> • If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: <ol style="list-style-type: none"> 1. Cease all works immediately; 2. Report incident to the Sustainability Manager; 3. Contact an archaeologist to inspect the site; 4. Report incident to the competent authority; and 5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Choma Village	Mining Right area	EO	Monthly – During Construction Yearly thereafter	Proactively	<ul style="list-style-type: none"> • Measure levels of subsidence and compare with recorded baseline conditions; • Status quo will be recorded through photographs; • Results will be maintained; and • Results will be reported in the progress reporting.
Iron Age Sites, Stone Walling, Historical Features and Stone Age sites (HCAC 1, HCAC 13, HCAC 16, HCAC 27, HCAC 28, DW004, DW006, DW013, DW014 , DW018, DW020, DW022)	Mining Right area	EO Project Archaeologist	Monthly – During Construction Yearly thereafter	Proactively	<ul style="list-style-type: none"> • Measure levels of subsidence and compare with recorded baseline conditions; • Status quo will be recorded through photographs; • Results will be maintained; and • Results will be reported in the progress reporting.

10.6 Management Measures for inclusion in the EMPr

Table 24. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Ground clearance, excavations as well as construction and operation	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	EO Checklist/Report
Choma Village	<ul style="list-style-type: none"> Consultation with the Choma representatives and SAHRA to ensure acceptable conservation thresholds and an adequate buffer around the site. Consultation with Choma representatives regarding intangible heritage features and unrecorded heritage features including graves; Conservation and Heritage Management plan (as per SAHRA guidelines). Monitoring during construction. 	<p>Pre Construction</p> <p>Pre Construction</p> <p>Pre Construction</p> <p>Construction and Operation</p>	Throughout the project	Applicant EO Archaeologist	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	EO Checklist/Report Submit to SAHRA for comments
Stone Walled Sites	<ul style="list-style-type: none"> Adjust lay out to retain the site as far as feasible. If not possible heritage mitigation that include 	All	Throughout the project	Applicant and EO Archaeologist	Ensure compliance with relevant legislation and recommendations from	EO Checklist/ Report

HIA – Vygenhoek

December 2020

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
	surface collection, photographs and mapping <ul style="list-style-type: none"> Monitoring during construction Apply for a destruction permit. 				SAHRA under Section 35 and 38 of NHRA	
Burial Sites	<ul style="list-style-type: none"> All graves should be indicated on development plans and avoided 	All	Throughout the project	Applicant and ECO	Retain graves in situ	ECO Checklist/ Report
Possible Grave	<ul style="list-style-type: none"> Confirm that the site is a grave, if so possible micro adjustment of the haul road to retain site in Situ with an adequate buffer zone and safe access for family members 	Confirmation of grave prior to development,	Throughout the project	Applicant and ECO Archaeologist	Retain graves in situ	ECO Checklist/ Report

10. KNOWLEDGE GAPS

Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded. This limitation is successfully mitigated with the implementation of a chance find procedure. Several intangible heritage sites occur in the area (Digby Wells 2012) and should be further investigated as a condition of authorisation. This should be done through social consultation with the representatives of the Choma Village.

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12. Appendices:**Appendix A
Curriculum Vitae of Specialist**

Jaco van der Walt
Archaeologist

jaco.heritage@gmail.com
+27 82 373 8491
+27 86 691 6461

Education:**Particulars of degrees/diplomas and/or other qualifications:**

Name of University or Institution:	University of Pretoria
Degree obtained :	BA Heritage Tourism & Archaeology
Year of graduation :	2001
Name of University or Institution:	University of the Witwatersrand
Degree obtained :	BA Hons Archaeology
Year of graduation :	2002
Name of University or Institution :	University of the Witwatersrand
Degree Obtained :	MA (Archaeology)
Year of Graduation :	2012
Name of University or Institution :	University of Johannesburg
Degree :	PhD
Year :	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	Owner – HCAC (Heritage Contracts and Archaeological Consulting CC).
2007 – 2010 :	CRM Archaeologist , Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	CRM Archaeologist , Director of Matakoma Heritage Consultants
2004:	Technical Assistant , Department of Anatomy University of Pretoria
2003:	Archaeologist , Mapungubwe World Heritage Site
2001 - 2002:	CRM Archaeologists , For R & R Cultural Resource Consultants, Polokwane
2000:	Museum Assistant , Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:**Archaeological Impact Assessments (Phase 1)**

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chlookop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booyendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
Accreditation:
 - Field Director Iron Age Archaeology
 - Field Supervisor Colonial Period Archaeology, Stone Age
Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
 - J van der Walt, A Meyer, WC Nienaber
 - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
 - WC Nienaber, M Hutten, S Gaigher, J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
 - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
 - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
 - J van der Walt, P Birkholtz, W. Fourie
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic
- J'jnanalysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
 - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep*)
 - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
 - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marelize Lombard Senior Lecturer, University of Johannesburg, South Africa
E-mail: mlombard@uj.ac.za
2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
University of the Witwatersrand
3. Alex Schoeman University of the Witwatersrand
E-mail: Alex.Schoeman@wits.ac.za