HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED KRANSPAN COLLIERY, MPUMALANGA PROVINCE

Type of development:

Mine

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20 Feb 2019	Addressed comments from client – editing and queries.
24 April 2019	Added impact assessment of Wash Plant alternatives.

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REPORT OUTLINE

Appendix 6 of the GNR 982 EIA Regulations, 2014 [as amended] 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 GNR 982 EIA Regulations, 2014 [as amended]	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	*Declaration of Independence*
(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 a site plan identifying site alternative;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 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
(I) 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 9 and 10
(l) Conditions for inclusion in the environmental authorisation	Section 9 and 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9 and 10
(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 10.2
(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 EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Ilima Coal Company (Pty) Ltd. (Ilima Coal) has appointed ABS Africa (Pty) Ltd to undertake environmental authorisations associated with the proposed Kranspan Coal Project. The mining right area is located on nine portions of the Farm Kranspan 49IT, Mpumalanga Province, approximately 13 km south-west of the town of Carolina. The planned operations entail both surface and underground mining as well as the establishment of various mine support infrastructure within the proposed mining right area.

HCAC was appointed by ABS Africa (Pty) Ltd to conduct a Heritage Impact Assessment of the project footprint (study area) to determine the presence of cultural heritage sites and the impact of the proposed project on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the footprint of the mine surface layout.

The study area is characterised by extensive maize fields that have been cultivated from prior to 1966. These agricultural activities would have impacted on surface indicators of heritage sites. However, several sites were still intact and recorded during the survey (Table 2).

In terms of the built environment (Section 34 of the NHRA) nine ruins were recorded (KP 6, KP 9, KP 11, KP 12, KP 13, KP 15, KP 17, KP 21, KP 22). Apart from KP 11, 15 and 17 that will not be directly impacted on the other ruins are all located in the preferred plant and opencast area. Although these ruins' potential to contribute to aesthetic, historic, scientific and social aspects is low, if confirmed to be older than 60 years these features are protected by legislation and must be assessed by a conservation architect.

Archaeological remains are sparse throughout the study area and three sites (KP 1, 2 & 3) were recorded centred around pans. These sites consist of a scatter of Stone tools, possible rock art and a small shelter. Fortunately, these sites are within environmental buffer zones around the pans and will not be directly impacted on. An independent paleontological study (Millsteed 2019) found that it is evident that the proposed mining operations pose a risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required. Detailed recommended control mitigation measures are included in Section 10 of this report.

In terms of Section 36 of the Act six cemeteries (KP 4, KP 5, KP 7, KP 14, KP 16, KP 18) were recorded. Four of the cemeteries are located in the pit and wash plant area and will be directly impacted on (KP 4, 5, 7 and 18). Two of the cemeteries could be indirectly impacted on. It is recommended that these cemeteries should be retained *in situ*, with a 50 m buffer zone and demarcated with an access gate where possible. If this is not possible these cemeteries can be relocated adhering to legislation. More graves/ cemeteries can be expected in the mining right area and if any additional graves are identified they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

No public monuments are located within or close to the study area. The study area is rural in character with an emphasis on agriculture with several mining operations next to the current study area and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. During the public participation process conducted for the project no heritage concerns were raised.

Table 2. Recorded sites.

Label	Longitude	Latitude	Description	Heritage Significance	Impact Area
KP 1	30° 01' 24.7261" E	26° 09' 31.9931" S	Small Shelter	Low Significance	No direct impact
KP 2	30° 01' 20.9747" E	26° 09' 34.8084" S	Possible Rock Art	Low to Medium Significance	No Direct Impact
KP 3	30° 01' 16.4856" E	26° 09' 34.0812" S	Miscellaneous Stone Tools	Low significance	No Direct impact
KP 4	30° 00' 52.1028" E	26° 09' 42.6708" S	Graves	High Social Significance	Preferred Plant Area
KP 5	30° 00' 44.4671" E	26° 09' 54.2413" S	Graves	High Social Significance	Preferred Plant Area
KP 6	30° 00' 39.9780" E	26° 09' 53.9927" S	Ruin	Low	Preferred Plant Area
KP 7	30° 00' 38.7179" E	26° 09' 54.1547" S	Graves	High Social Significance	Preferred Plant Area
KP 8	30° 00' 51.0877" E	26° 09' 52.3693" S	Stone Cairn	Low significance unless confirmed as a grave – then High Social significance	Preferred Plant Area
KP 9	30° 00' 27.8640" E	26° 09' 36.8425" S	Ruin	Low significance	Opencast Area
KP 10	30° 00' 26.1325" E	26° 09' 08.5608" S	Stone Cairn	Low significance unless confirmed as a grave – then High Social significance	No Direct Impact
KP 11	30° 00' 34.3440" E	26° 09' 18.2376" S	Ruin	Low significance	No Direct Impact
KP 12	29° 59' 52.1701" E	26° 10' 03.1800" S	Ruin	Low to medium significance	Opencast Area
KP 13	29° 59' 56.0041" E	26° 10' 02.3303" S	Ruin	Low significance	Opencast Area
KP 14	30° 01' 59.4588" E	26° 09' 54.4284" S	Graves	High Social Significance	No direct impact
KP 15	30° 01' 19.2252" E	26° 11' 32.7984" S	Ruin	Low significance	No Direct impact
KP 16	30° 01' 14.2213" E	26° 11' 39.7897" S	Graves	High Social Significance	No direct impact
KP 17	30° 01' 57.6712" E	26° 09' 59.8100" S	Ruin	Low to medium significance	No direct impact
KP 18	29° 59' 43.0999" E	26° 10' 06.3001" S	Grave	High Social Significance	Opencast Area

KP 19	30° 00' 54.0144" E	26° 08' 50.5465" S	Stone Cairn	Low significance unless confirmed as a grave – then High Social significance	Topsoil and Overburden Facility
KP 20	29° 59' 02.0219" E	26° 10' 22.3393" S	Stone Cairn	Low significance unless confirmed as a grave – then High Social significance	Opencast area
KP 21	29° 59' 47.2199" E	26° 10' 08.3028" S	Ruin	Low to medium significance	Opencast Area
KP 22	29° 59' 50.3557" E	26° 10' 08.1408" S	Ruin	Low to medium significance	Opencast Area

The impact of the proposed project on heritage resources is considered low to medium and impacts can be mitigated to an acceptable level. The greatest risk to the project is the location of known and unknown graves. It is therefore recommended that the proposed project can commence (from a heritage perspective) on the condition that the following recommendations are implemented as part of the EMPr together with site specific recommendations and based on approval from SAHRA:

- The historic structures (KP 9, 12, 17, 21 and 22) should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.
- The cemeteries located in the pit and wash plant area (KP 4,5,7 and 18) will be directly impacted on. It is recommended that these cemeteries are preserved *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone. If this is not possible the cemeteries can be relocated adhering to all legal requirements.
- The cemeteries KP 14 and 16 could be indirectly impacted by the development and it is therefore recommended that the cemeteries are preserved *in situ*, fenced with an access gate for family members, with a feasible buffer zone.
- The total number of graves should be confirmed prior to development.
- It is recommended that during the social consultation process to be undertaken by the mine Community Liaison Officer it should be confirmed whether the identified stone cairns represent graves (KP 8 and 20 are located within the impact area).
- Through the social consultation process, to be undertaken by the mine Community Liaison Officer, the existence of unknown and unmarked graves associated must be confirmed in order to mitigate any graves not identified in this study. The implementation of a chance find procedure is recommended.
- Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;
- Implementation of a chance find procedure

In terms of the palaeontological heritage the following recommendations apply:

During the construction phase of the mine:

- When the surface infrastructure elements of the mine are being constructed these locations must be regularly inspected to observe if the excavations have encountered bedrock of the Vryheid Formation.
- These regular inspections should be made by a suitable mine employee (such as the environmental officer) who has been trained to identify the types of fossils that may reasonably be expected to occur within the Vryheid Formation.
- Should fossil materials be identified, the excavations must be halted in that area and SAHRA informed of the discovery. An experienced Karoo palaeontologist should be contacted by the mine to assess the significance of the fossils.
- If fossil materials prove to be scientifically significant the palaeontologist should make recommendations that they should be either be protected completely *in situ* or could have damage mitigation procedures emplaced (i.e., excavation by a suitability by a suitably experienced palaeontologist) to minimise negative impacts.

Once excavation of the opencast pit voids begins:

- On-site checks for the occurrence of any fossils of the excavated pits and stockpiled material should be conducted biannually (i.e., every six months).
- The frequency of these checks should be reassessed after twelve (12) months based on the findings.
- The Karoo palaeobotanist should submit a monitoring report to SAHRA on this work.

In addition,

- Should any fossil materials be identified, the palaeontologist should ascertain their scientific and cultural importance. Should the fossil prove scientifically or culturally significant the particular excavations involved should be halted and SAHRA informed of the discovery

- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

When the underground mining component of the mining program commences no damage mitigation protocols are recommended. The coals comprising Seam E are the product of a complex series of jellification and other coalification processes that transformed the original vegetation (peat) into coal. Recognisable plant macrofossil materials are not expected to be present within the coals. Such plant macrofossil materials may be present within any siliciclastic partings within the seam. However, the automatic mining machinery will destroy any such fossils before they can be recognised as being present. Similarly, modern industrial health and safety rules would make it extremely difficult for a palaeontologist to be able to access and work at a working mine face. Should scientifically or culturally significant fossil material exist within the project area any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	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: • 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	1/ 02/ 2019

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

AIA: Archaeological Impact Assessment
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
EMP: Environmental Management Programme
EMPR: Environmental Management Programme Report
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
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:

Heritage Contracts and Archaeological Consulting CC (HCAC) has been contracted by ABS Africa (Pty) Ltd to conduct a heritage impact assessment of the proposed Kranspan Project. The mining right area is located on nine portions of the Farm Kranspan 49IT, Mpumalanga Province, approximately 13 km south-west of the town of Carolina (Figure 1 -3). The report forms part of the Environmental Impact Assessment (EIA) Report and Environmental Management Programme Report (EMPR) for the proposed project.

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, historical structures, archaeological features as well as cemeteries 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 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. As such the Environmental Impact Report and its appendices must be submitted to the case officer 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).

Project description

The planned operations entail both surface and underground mining as well as the establishment of various mine support infrastructure within the proposed mining right area and Illima indicated the following:

1. There will be both opencast (roll over) and underground (bord & pillar) mining operations on the project area. The attached plan defines the areas.
2. At this stage, only the E-Seam will be mined. There are some localised areas where the B Seam and CU and CL are present, however they appear to be uneconomic.
3. Mining will commence with opencast areas and underground operations will be started later.
4. The MWP makes provision for a beneficiation plant.

The mine infrastructure will be situated in the south-eastern portion of the farm Kranspan 49IT and will consist of the following:

- Opencast mining areas with contractor's camp.
- Haulroads to access the mining areas.
- Adits from opencast highwalls to provide access to the underground mining.
- ROM stockpile areas.
- Upcast ventilation shaft with the main fan situated on this shaft.
- Offices, stores, workshop, change house, and lamp room, all prefabricated structures that allows for easy removal and rehabilitation of the site.
- Parking area.
- Diesel Tanks
- Crushing and Screening Plant (Raw)
- Dense Medium beneficiation plant
- Product stockpiles and loading area.
- Discard/Tailings
- Onsite laboratory
- Weighbridges
- An access road to the shaft that will be constructed along the overland conveyor route and in the same servitude.

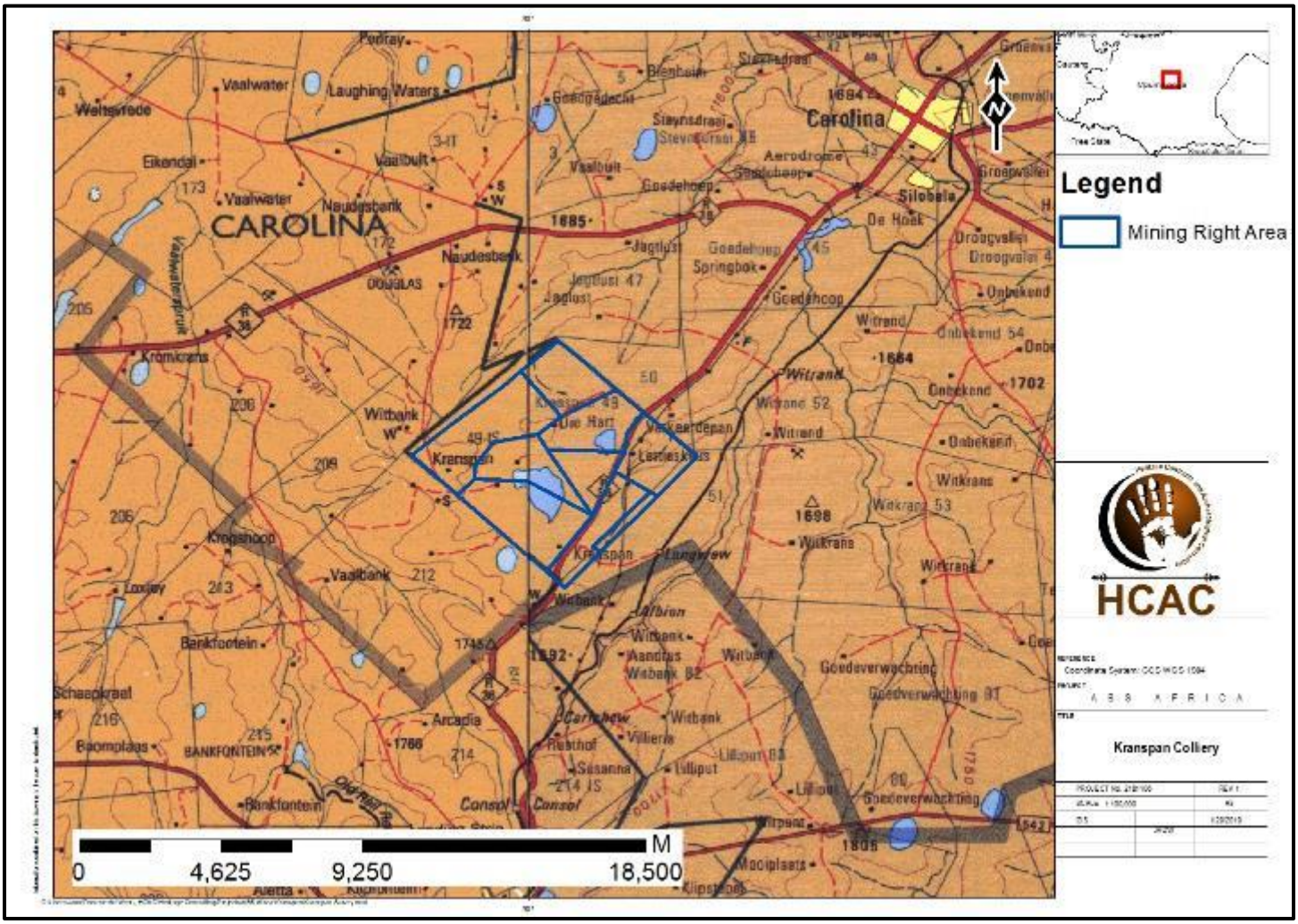

Figure 1. Provincial locality map (1: 250 000 topographical map).

Figure 2. Site layout as provided by ABS Africa (Pty) Ltd.

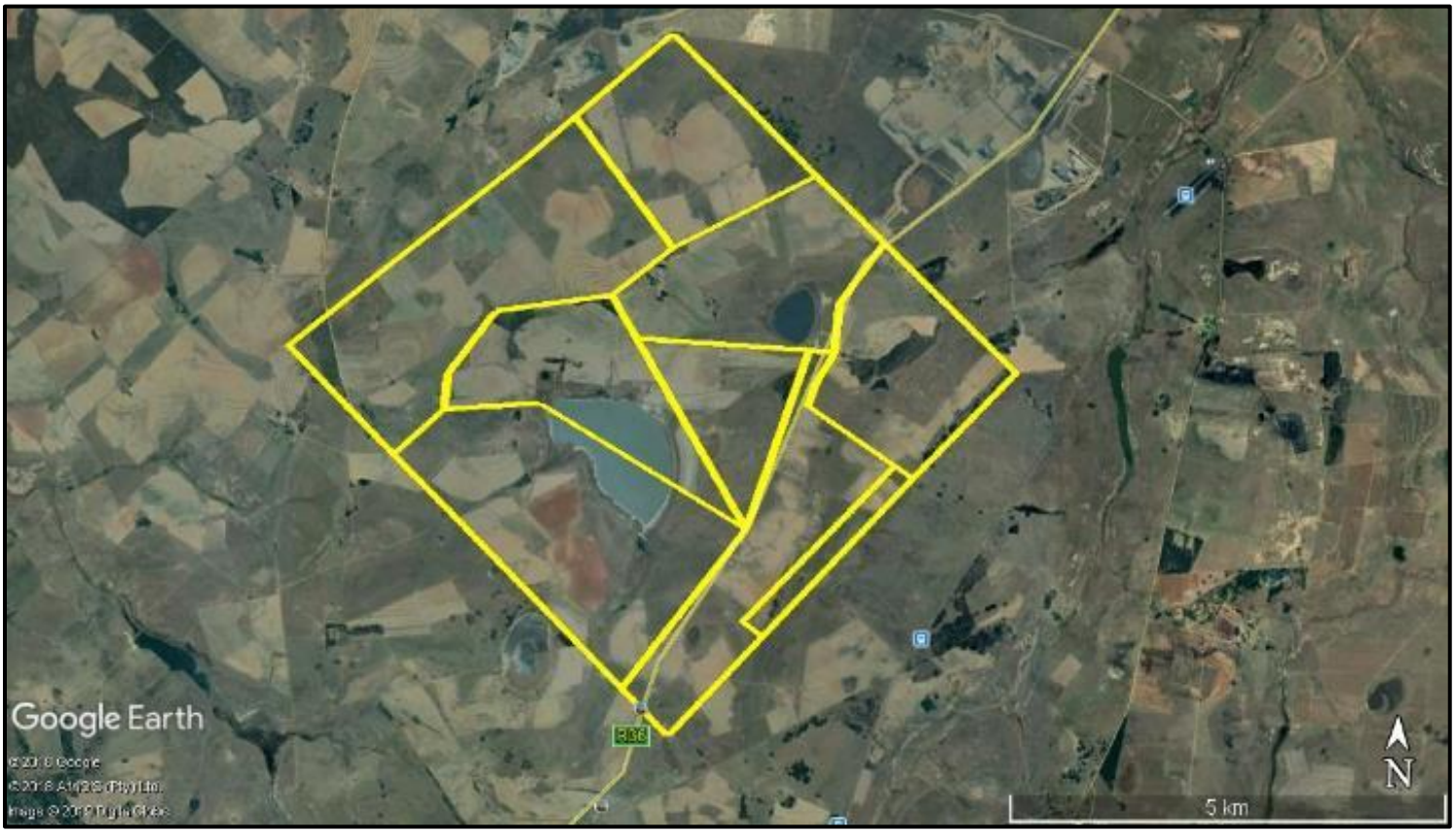

Figure 3. Google image of the mining right area.

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 professional evaluation of Phase 1 reports upon which review comments will be issued. 'Best practice' requires Phase 1 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 AIA 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 AIA'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 field work 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 and opportunity for I&APs to comment on the draft reports.
- The compilation of a Comments and Response Report (CRR).

3.4 Site Investigation

Conduct a field study to: a) systematically 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 3: Site Investigation Details

	Site Investigation
Date	21 – 25 January 2019
Season	Summer - The area has been extensively cultivated and the maize was approximately 2 m high at the time of the field visit. The impact area was sufficiently covered (Figure 4) to adequately record the range of heritage resources in the study area.

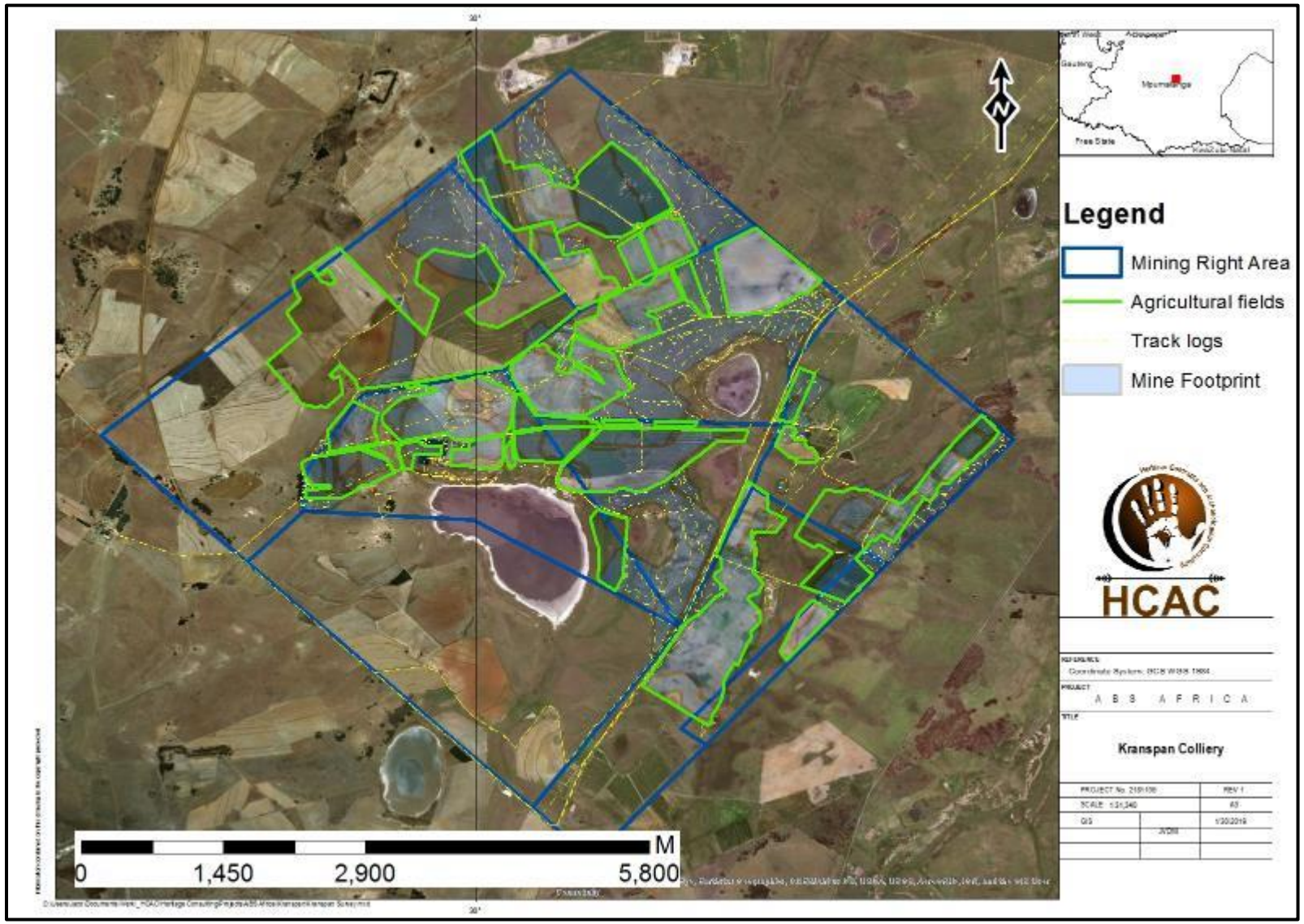

Figure 4: Track logs of the survey in green.

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.

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

ABS Africa (Pty) Ltd requested that for consistency their standard impact assessment methodology should be included for this project. It is included as Appendix B.

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 subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit 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

Stats SÁ provides the following information: The total population of the Albert Luthuli Local Municipality is 186,010. Of those aged 20 years and older, 4,4% have completed primary school, 28,8% have some secondary education, 27% have completed matric and 6,3% have some form of higher education. 35,4% of the 45 116 economically active individuals (i.e. those who are employed or unemployed but looking for work) are unemployed.

5 Description of the Physical Environment:

The Kranspan Prospecting Right area is located in the Mpumalanga Province of South Africa, some 13 km southwest of Carolina (Figure 1). The Project can be accessed via the R36 paved provincial road if travelling from the north or the south. The nearest sizeable towns are Carolina, 13 km to the northeast. There are numerous farm homesteads (structures not older than 60 years that is currently occupied) situated within the Project Area. The land is currently mainly used for maize, cattle and sheep farming although mining operations is located adjacent to the study area (Figure 5 – 8). The surface topography is undulating, with gradual rises and falls over the area with the highest elevations towards the central portion of the Project area. The vegetation of the general area and the proposed site consists of Eastern Highveld Grassland (Mucina & Rutherford 2006). Two large pans occur in the area that would have been focal points in antiquity.

Figure 5. General site conditions.

Figure 6. Mining operations adjacent to the study area.

Figure 7. Existing cultivation in the study area.

Figure 8. Existing cultivation in the study area.

6 Results of Public Consultation and Stakeholder Engagement:

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.

7 Literature / Background Study:

7.1 Literature Review

The following CRM reports were conducted in the vicinity and were consulted for this report:

Author	Year	Project	Findings
Van Schalkwyk, J.	2003	Archaeological Survey of a Section of The Secunda-Mozambique Gas Pipeline, Carolina District, Mpumalanga	Cemeteries
Pistorius, JCC.	2007	A Phase I Heritage Impact Assessment (HIA) Study for The Upgrading of Eskom's Nooitgedacht Substation on The Farm Wintershoek 451 Near Carolina In the Mpumalanga Province of South Africa	No sites were recorded.
Van Schalkwyk, J. A.	2007	Heritage Impact Assessment for The Planned Development on The Farms Hebron 421JT And Twyfelaar 11 IT, Carolina Municipal District, Mpumalanga Province	Iron Age, Historical Sites and Cemeteries were recorded.
Van Schalkwyk, J.A.	2007	Heritage Impact Scoping Report for The Planned Hendrina-Marathon Powerline, Mpumalanga Province	Settlements to initiation sites, industrial and farming related sites as well as cemeteries were noted in the area.
Pelser, A and Van der Walt, J.	2008	A Report on A Heritage Impact Assessment for Proposed Opencast Coal Mining Operations for The Klippan Colliery on The Farm Klippan 452 JS (Emachibini), Wonderfontein, Mpumalanga	Graves were recorded.
Pelser, A.	2012	A Report on a Heritage Impact Assessment (HIA) For the Proposed Motshaotshele Colliery Project, Close to Hendrina, Mpumalanga Province	Cemeteries

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are on record close to the impact areas.

7.2 General History of the area

7.2.1 Stone Age

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 et al. 2012). The three main phases can be divided as follows;

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

Early Stone Age:

The Early Stone Age in southern Africa is defined by the Oldowan complex, primarily found at the sites Sterkfontein, Swartkrans and Kromdraai, situated within the Cradle of Humankind, just outside Johannesburg (Kuman, 1998). Within this complex, tools are more casual and expediently made, and tools consist of rough cobble cores and simple flakes. The flakes were used for such activities as skinning and cutting meat from scavenged animals. This industry is unlikely to occur in the study area.
The second complex is that of the more common Acheulean, defined by large hand axes and cleavers produced by hominids at about 1.4 million years ago (Deacon & Deacon, 1999). Among other things, these Acheulian tools were probably used to butcher large animals such as elephants, rhinoceros and hippopotamus that had died from natural causes. Acheulian artefacts are usually found near the raw material from where they were quarried, at butchering sites, or as isolated finds. No Acheulian sites are on record near the project area, but isolated finds are possible. However, isolated finds have little value.

Middle Stone Age:

During the Middle Stone Age, significant changes start to occur in the evolution of the human species. These changes manifest themselves in the complexity of the stone tools created, as seen in the diversity of tools, the standardisation of these tools over a widespread area, the introduction of blade technology, and the development of ornaments and art. What these concepts ultimately attest to is an increase or development of abstract thinking. By the beginning of the Middle Stone Age (MSA), toolkits included prepared cores, parallel-sided blades and triangular points hafted to make spears (Volman, 1984). MSA people had become accomplished hunters by this time, especially of large grazing animals such as wildebeest, hartebeest and eland.
These hunters are classified as early humans, but by 100,000 years ago, they were anatomically fully modern. The oldest evidence for this change has been found in South Africa, and it is an important point in debates about the origins of modern humanity. In particular, the degree to which behaviour was fully modern is still a matter of debate. The repeated use of caves indicates that MSA people had developed the concept of a home base and that they could make fire. These were two important steps in cultural evolution (Deacon & Deacon, 1999). Accordingly, if there are caves in the study area, they may be sites of archaeological significance. MSA artefacts are common throughout southern Africa, but unless they occur in undisturbed deposits, they have little significance.

Later Stone Age:

The Later phases of the Stone Age began at around 20 000 years BP (Before Present). This period was marked by numerous technological innovations and social transformations within these early hunter-gatherer societies. Hunting tools now included the bow and arrow. More particularly, the link-shaft arrow which comprises a poisoned bone tip loosely linked to a shaft which fell away when an animal was shot and left the arrow tip embedded in the prey animal. Other innovations included bored stones used as digging –stick weights to help with the uprooting of tubers and roots, small stone tools, normally less than 25mm long, which was used for cutting meat and scraping hides. There were also polished bone needles, twine made from plant fibres, tortoiseshell bowls, fishing equipment including bone hooks and stone sinkers, ostrich eggshell beads and other decorative artwork (Delius, 2007).

These people may be regarded as the first modern inhabitants of Mpumalanga, known as the San or Bushmen. They were a nomadic people who lived together in small family groups and relied on hunting and gathering of food for survival. Evidence of their existence is to be found in numerous rock shelters throughout the Eastern Mpumalanga where some of their rock paintings are still visible. A number of these shelters have been documented throughout the Province (Bornman, 1995; Schoonraad in Barnard, 1975; Delius, 2007). These include areas such as Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg and Ohrigstad.

At Honingklip near Badplaas in the Carolina District, two LSA rock shelters with four panels of rock art was discovered and archaeologically investigated. The site was used between 4870 BP and as recently as 200 BP. Stone walls at both sites date to the last 250 years of hunter-gatherer occupation and they may have served as protection against intruders and predators. Pieces of clay ceramic and iron beads found at the site indicate that there was an early social interaction between the hunter-gatherer (San) communities and the first farmers who moved into this area at around 500 AD.

Three late Stone Age sites are on record in the greater area. The sites are Welgelegen Skuiling close to Ermelo, Chrissiesmeer (also known for rock art) and lastly Groenvlei close to Carolina; this area is also known for rock art (Bergh 1999).

7.2.2 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 the 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.

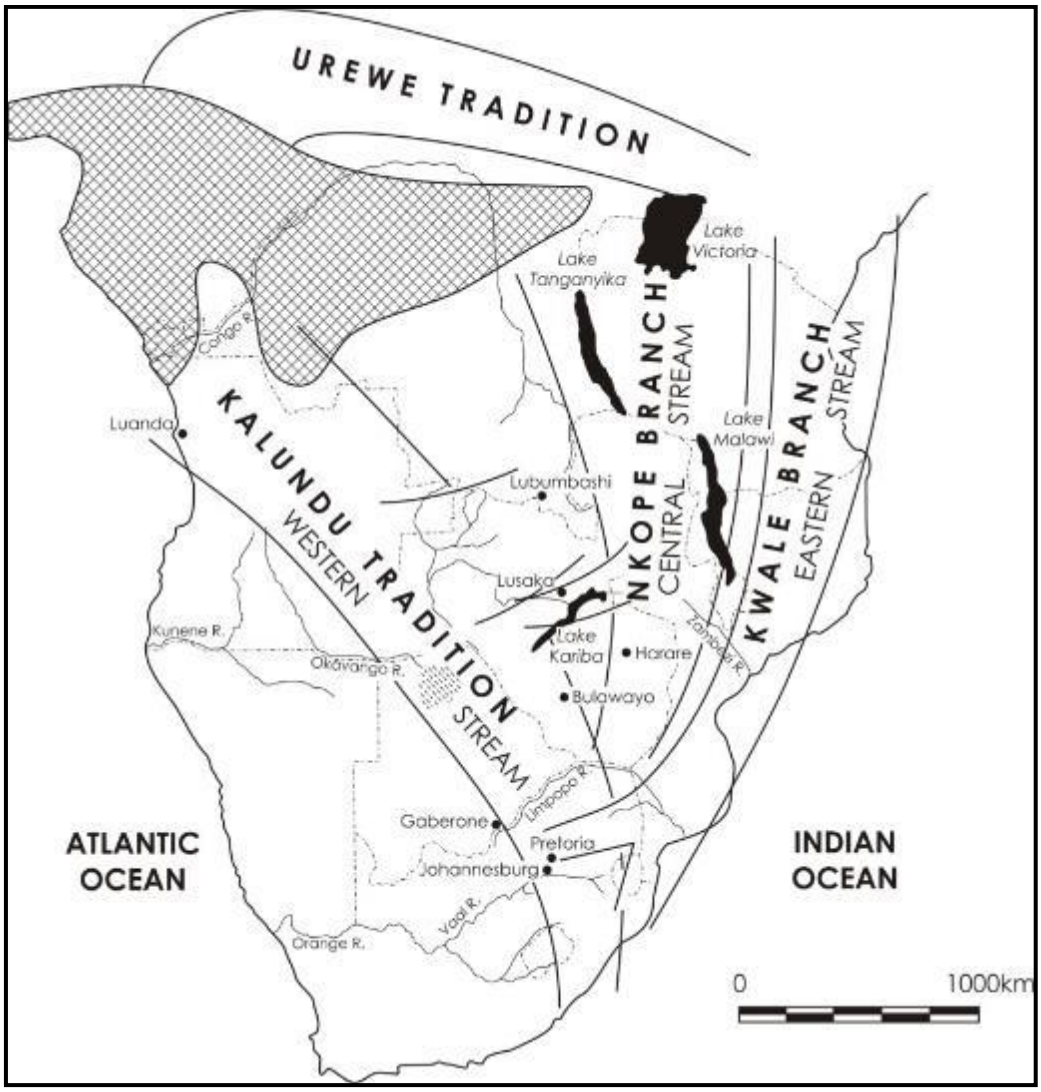

Figure 9. Movement of Bantu speaking farmers (Huffman 2007).

Early and Middle Iron Age
No sites dating to this period are on record close to the study area.

Late Iron Age
Stonewalled settlements are well known around the Watervalboven and Machadodorp area to the north of the study area, in fact, these settlements are found all along the Mpumalanga escarpment, from Ohrigstad in the north, all the way to Carolina in the south (Maggs 2007). These settlements consist of roughly circular homesteads linked by walled roads or cattle tracks associated with agricultural terraces. These complexes sometimes extend over several square kilometres, and some researchers claim that these settlements are the most prominent footprint on the landscape of any pre-colonial society in South Africa and compare this complex agricultural system to the internationally renowned terraced settlements of Nyanga in eastern Zimbabwe (Delius et al. 2012).

7.2.3 Anglo-Boer War

Figure 10. The Witkloof Monument (http://www.boerenbrit.com).

The Witkloof Monument (Figure 9) stands testament to an interesting battle that took place in the larger area namely the battle of Leliefontein. According to the map (Figure 10) from J.S. Bergh, (red), Geskiedenisatlas van Suid-Afrika, Die vier noordelike provinsies, p. 54, there were two concentration camps located to the north of the study area close to Belfast. These sites will not be impacted by the development.

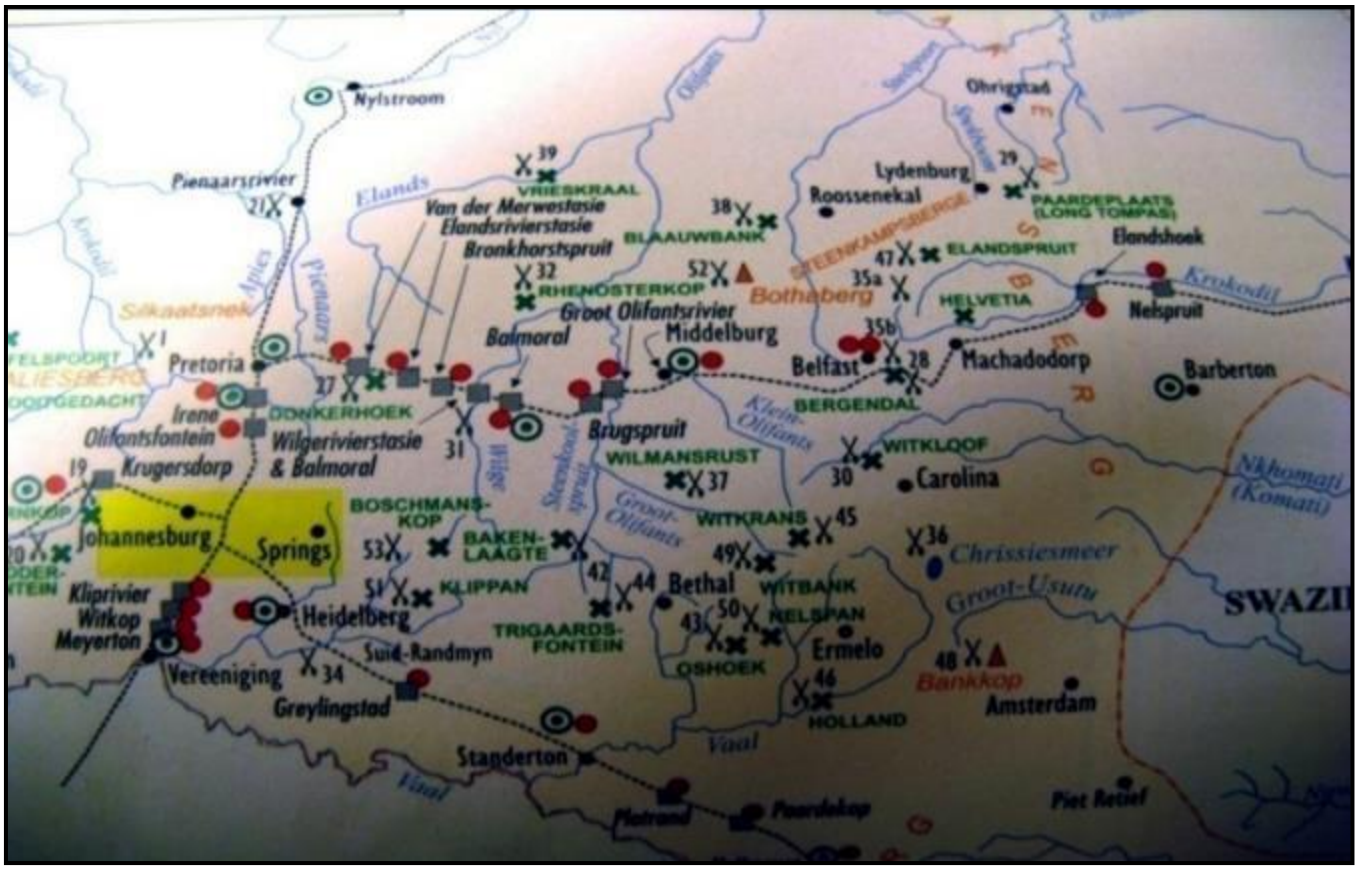

Figure 11. Concentration camps represented by red dots and railway stations with grey squares (Bergh 1999).

7.3 Cultural Landscape

The cultural landscape of the study area is characterised by extensive cultivation from prior to 1966 (Van der Walt 2018).

8 Findings of the Survey

The greater area is characterised by agricultural activities and has been extensively cultivated. The area has been used for agricultural purposes from prior to the 1960's (Van der Walt 2018) and evidence of historical occupation of the area was recorded in the form of historical buildings and burial sites. During the survey 22 heritage features (Figure 12) were recorded. These sites were numbered numerically with the pre-fix KP for Kranspan. Several of these sites fall outside of the current mine layout and will not be directly impacted (Table 2). Below is a short description of identified Heritage Resources (NHRA Section 34 - 36) as protected by the NHRA.

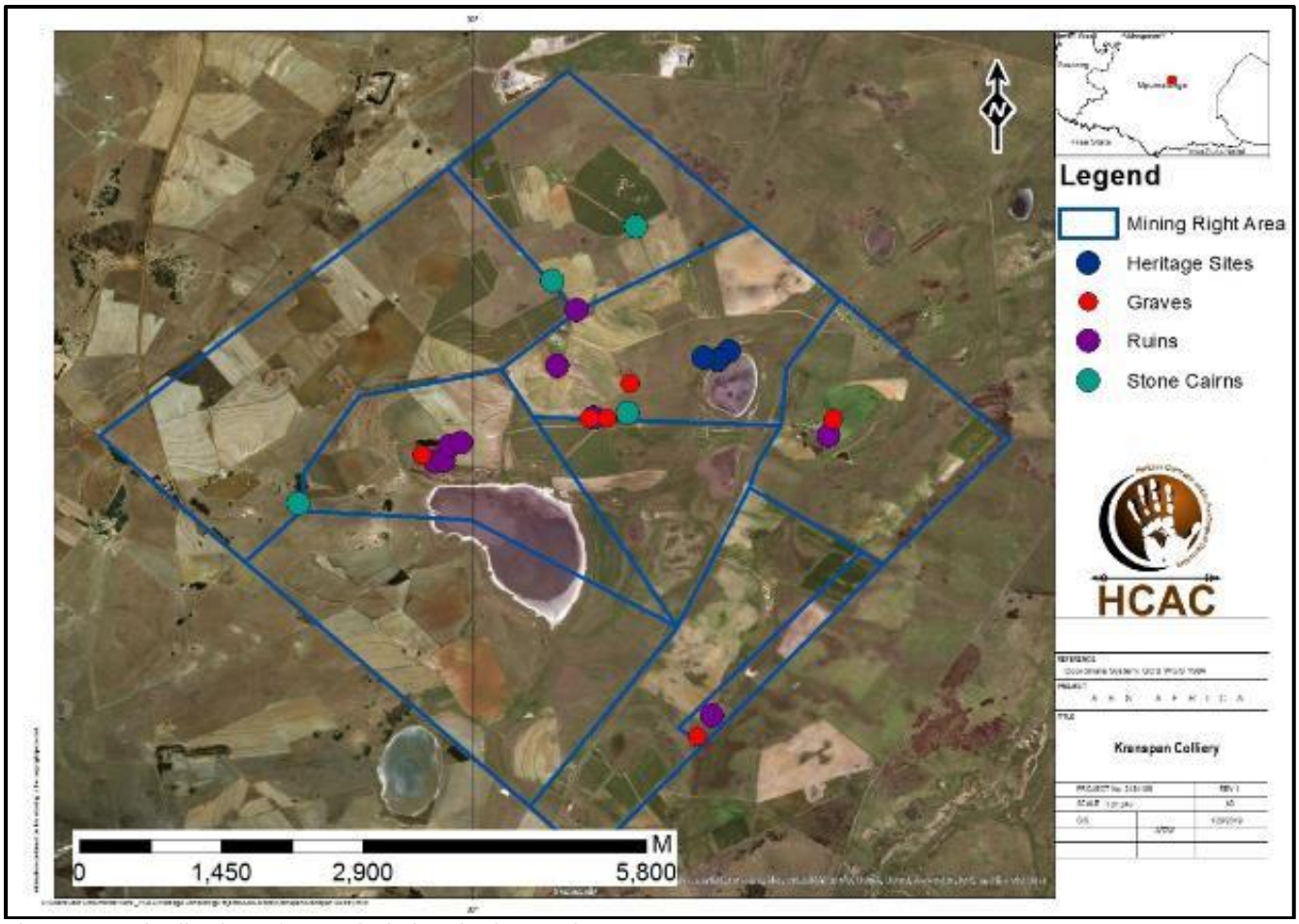

Figure 12: Distribution of recorded sites in the study area.

8.1.1 Built Environment (Section 34 of the NHRA)

Several farm labourer dwellings and farm homesteads occur in the study area (Figure 13 – 16. These structures have not been recorded individually as they are not older than 60 years and of no heritage significance.

Figure 13. Farm labourer dwelling in study area.

Figure 14. Modern farmstead.

Figure 15. Abandoned ruin.

Figure 16. Modern farmstead with manicured lawns.

Nine ruins were recorded (Table 4). The record structures' potential to contribute to aesthetic, historic, scientific and social aspects are low to moderate and it is therefore of low heritage significance. If structures (KP 9, 12, 17, 21 and 22) are older than 60 years, they are protected by the NHRA and a permit application process would have to be followed if the structures are to be impacted on in any way. It should also be noted that the recorded farm labourer dwellings are often associated with unmarked graves.

Table 4. Recorded ruins

LABEL	LONGITUDE	LATITUDE	DESCRIPTION
KP 6	30° 00' 39.9780" E	26° 09' 53.9927" S	Ruin
KP 9	30° 00' 27.8640" E	26° 09' 36.8425" S	Ruin
KP 11	30° 00' 34.3440" E	26° 09' 18.2376" S	Ruin
KP 12	29° 59' 52.1701" E	26° 10' 03.1800" S	Ruin
KP 13	29° 59' 56.0041" E	26° 10' 02.3303" S	Ruin
KP 15	30° 01' 19.2252" E	26° 11' 32.7984" S	Ruin
KP 17	30° 01' 57.6712" E	26° 09' 59.8100" S	Ruin
KP 21	29° 59' 47.2199" E	26° 10' 08.3028" S	Ruin
KP 22	29° 59' 50.3557" E	26° 10' 08.1408" S	Ruin

KP 6

Ruin that was constructed with cement bricks (Figure 17 and 18). The structure has a chimney but no longer has a roof. It was probably used for farm labourer housing. It should be noted that structures like these are often associated with the unmarked graves of still born babies.

Figure 17. Structure at KP6.

Figure 18. Structure at KP 6.

Heritage Significance: Low Heritage Significance
Field Rating: GP C

KP 9

The site comprises the ruin of a sandstone feature with a hipped roof that was added onto over time (Figure 19 – 22). Later additions onto the feature has been plastered. Besides the roof the structure has no other remaining fittings. The structure is dilapidated and no longer in use.

Figure 19. Structure with added on plastered sections.

Figure 20. Structure with hipped roof.

Figure 21. All the fittings have been removed.

Figure 22. General site conditions.

Heritage Significance: Low to medium Heritage Significance
Field Rating: GP B

KP 11

Red clay brick structure (Figure 23). The structure was probably used for farm labourer housing. It should be noted that structures like these are often associated with the unmarked graves of still born babies.

Figure 23. Structure at KP 11.

Heritage Significance: Low Heritage Significance
Field Rating: GP C

KP 12

The structure consists of a very dilapidated sandstone ruin that is highly overgrown with partial walls still standing. In the north eastern corner, the foundations of a circular hut constructed with ferricrete was recorded. The structure is probably older than 60 years.

Figure 24. Sandstone structure at KP 12.

Figure 25. Ferricrete structure at KP 12.

Figure 26. General site conditions at KP 12.

Heritage Significance: Low to Medium Significance
Field Rating: GP B

KP 13

The site comprises an abandoned cement brick feature (Figure 27) and associated remains (chicken coop). The site is associated with farm labourer dwellings. It should be noted that structures like these are often associated with the unmarked graves of still born babies.

Figure 27. Abandoned dwelling at KP13.

Heritage Significance: Low Significance
Field Rating: GP C

KP 15

KP 15 comprises the ruin of a farm labourer dwelling (Figure 29 and 29) that has been altered over the years. The structure has been added onto with red sundried bricks, mud bricks and ferricrete that was plastered. The remains of a sheep kraal also occur on site. It should be noted that structures like these are often associated with the unmarked graves of still born babies.

Figure 28. Dilapidated structure at KP 15.

Figure 29. General site conditions at KP 15.

Heritage Significance: Low Significance
Field Rating: GP C

KP 17

A large sandstone farm complex, the outlying buildings are currently being used as sheds (Figure 30). The main dwelling is very dilapidated with only a few walls standing with no roof / roof trusses (Figure 31). KP 17 is associated with the cemetery at KP 14.

Figure 30. Outlying buildings still in use.

Figure 31. Ruins of main dwelling.

Heritage Significance: Low to medium significance
Field Rating: GP B

KP 21

Large ruin containing multiple structures and features. The large house has sections that seem older and built from sandstone blocks (Figure 33). The later sections were built from brick and cement (Figure 34 and 35). The house is roughly 30m x 15m in size with the older section situated in the western part of the structure. Other structures include a garage or warehouse and a cold room constructed by layers of cement bricks that were filled up with rubble. Multiple large trees are present around the house with a packed stone feature under a large tree directly NW of the house (possible platform). The structures have no roof.

Figure 32. Structures at KP 21.

Figure 33. Structures at KP 21.

Figure 34. Structures at KP 21.

Figure 35. Structures at KP 21.

Heritage Significance: Low to Medium significance
Field Rating: GP B

KP 22

Partially collapsed structure built from large sandstone blocks. The structure is approx. 15m x 8m in size. The area is surrounded by very thick overgrowth of grass (Figure 36 to 39).

Figure 36. Structure at KP 22.

Figure 37. Wall at KP 22.

Figure 38. Structure at KP 22.

Figure 39. Structure at KP 22.

Heritage Significance: Low to medium significance
Field Rating: GP B

8.1.2 Archaeological and paleontological resources (Section 35 of the NHRA)

Archaeological remains are sparse in the study area. As expected, the only remains were recorded next to the pan that would have been a focal point for humans in antiquity. Because the pan and its margins are located within an environmental buffer zone no impact is foreseen on these features, therefore the areas around the pans was not surveyed in detail and more features can be expected in the buffer zone. The following archaeological features were recorded during the survey for the proposed project.

Table 5. Recorded archaeological features in the study area

LABEL	LONGITUDE	LATITUDE	DESCRIPTION
KP 1	30° 01' 24.7261" E	26° 09' 31.9931" S	Small Shelter
KP 2	30° 01' 20.9747" E	26° 09' 34.8084" S	Possible Rock Art
KP 3	30° 01' 16.4856" E	26° 09' 34.0812" S	Miscellaneous Stone Tools

KP 1

The shelter was formed by two large rocks that form a cavity and has been closed up with dry stone walling (Figure 40 and 41). There is no anthropogenic deposit, cultural material or artefacts.

Figure 40. Shelter.

Figure 41. Dry stone wall.

Heritage Significance: Low Significance
Field Rating: GP C

KP 2

Possible monochrome drawing in yellow approximately 10 cm wide (Figure 42). The drawing is very faded.

Figure 42. Possible Rock Art.

Heritage Significance: Low to Medium Significance
Field Rating: GP B

KP 3

Stone tool scatter consisting of two miscellaneous flakes located on a rock outcrop (Figure 43 and 44).

Figure 43. Scattered stone tools.

Figure 44. Area where stone tools was found.

Heritage Significance: Low Significance
Field Rating: GP C

In terms of the palaeontological component an independent study was conducted by Prof Barry Millsteed and found that:" *The aerial extent of the Mining Right application area is underlain by an assemblage of stratigraphic units consisting of coal-bearing sediments of the Vryheid Formation and intrusive dolerite of the Karoo Dolerite Suite. These bedrock units are overlain in part by a Cainozoic ferricrete layer that appears to be present upon the topographically higher areas within the project area. Lying upon the ferricrete and, in the topographically lower areas upon the Vryheid Formation strata is by a pervasive layer of unconsolidated Cainozoic regolith.*
Due to the methodologies employed in the opencast mining process and also the extreme costs of mining no negative impact upon the geological sequence will be expected to occur below the base of Seam E in the opencast voids as the mining will not extend deeper than that. Within the underground mining operations, the negative impacts upon the geology will be predominantly constrained to occurring within Seam E. Coal seams occur at depths between 5–75 m. The coal seams are relatively flat lying, but the depth of burial tends to increase towards the centre of the application area due to increasing topographic height of the land surface. Any negative impacts will be constrained to the Vryheid Formation and the overlaying geological units.*"* (Millsteed 2019)

Recommended mitigation protocols for the paleontological component are included in Section 10 of the report.

8.1.3 Burial Grounds and Graves (Section 36 of the NHRA)

In terms of Section 36 of the Act 6 cemeteries were recorded (Table 6).

Table 6. Recorded cemeteries in the study area

LABEL	LONGITUDE	LATITUDE	DESCRIPTION
KP 4	30° 00' 52.1028" E	26° 09' 42.6708" S	Graves
KP 5	30° 00' 44.4671" E	26° 09' 54.2413" S	Graves
KP 7	30° 00' 38.7179" E	26° 09' 54.1547" S	Graves
KP 14	30° 01' 59.4588" E	26° 09' 54.4284" S	Graves
KP 16	30° 01' 14.2213" E	26° 11' 39.7897" S	Graves
KP 18	29° 59' 43.0999" E	26° 10' 06.3001" S	Grave

KP 4

Approximately 26 graves in an overgrown area located under wattle trees (Figure 45). Due to the dense vegetation it is difficult to discern the total number of graves. Graves have stone packed dressings with some that are covered by cement slabs (Figure 46). The oldest visible date is 1963.

Figure 45. General site conditions.

Figure 46. Grave covered by a cement slab at KP 4.

Heritage Significance: High Social Significance
Field Rating: GP A

KP 5

Approximately 24 graves under wattle trees. Most of the graves have stone grave dressings (Figure 47) and are overgrown by the wattle trees (Figure 48). Two graves are marked by cement slabs (Figure 49) with the oldest visible date being 1974. The cemetery is overgrown and the final number of graves is unconfirmed.

Figure 47. Grave at KP 5.

Figure 48. Overgrown grave.

Figure 49. Grave with cement slab.

Figure 50. Stone packed grave.

Heritage Significance: High Social Significance
Field Rating: GP A

KP 7

Approximately 5 graves in the open veld associated with the ruin at KP 6 (Figure 51 -52). The graves have stone packed dressings (Figure 53) and no headstones.

Figure 51. General site conditions at KP 7.

Figure 52. General site conditions at KP7.

Figure 53. Stone packed grave at KP 7.

Heritage Significance: High Social Significance
Field Rating: GP A

KP 14

The cemetery is surrounded by stone walls (Figure 55) and comprises 14 graves mostly relating to the Pretorius family. The graves have granite headstones, is aligned east to west and well looked after (Figure 54).

Figure 54. Graves at KP 14.

Figure 55. General site conditions at KP 14.

Heritage Significance: High Social Significance
Field Rating: GP A

KP 16

Partially fenced cemetery with approximately 8 stone packed graves (Figure 56 and 57). The cemetery is highly overgrown and grave dressings consist of ferricrete. It is difficult to discern the total number of graves due to the vegetation cover.

Figure 56. General site conditions at KP16.

Figure 57. General site conditions at KP 16.

Heritage Significance: High Social Significance
Field Rating: GP A

KP 18

A single grave with a granite headstone was identified at KP 18 by Lucas Wells and brought to the attention of the author after the survey of the study area. No photographs of the site are available.

Heritage Significance: High Social Significance
Field Rating: GP A

8.1.3.1 Stone Cairns

Four stone cairns (Table 7) was identified that although unlikely could mark graves.

Table 7. Stone Cairns in the study area

LABEL	LONGITUDE	LATITUDE	DESCRIPTION
KP 8	30° 00' 51.0877" E	26° 09' 52.3693" S	Stone Cairn
KP 10	30° 00' 26.1325" E	26° 09' 08.5608" S	Stone Cairn
KP 19	30° 00' 54.0144" E	26° 08' 50.5465" S	Stone Cairn
KP 20	29° 59' 02.0219" E	26° 10' 22.3393" S	Stone Cairn

KP 8

Stone cairn located under a wattle tree (Figure 58 and 59) and could be a possible grave, or the remains of a demolished stone dwelling.

Figure 58. General site conditions at KP8.

Figure 59. Stone Cairn at KP8.

Heritage Significance: Low significance unless the site is confirmed to be a grave in which case it is of High Social Significance
Field Rating: GP C - if confirmed to be a grave, GP A

KP 10

Stone cairn marked by ferricrete (Figure 60) located under wattle trees. The cairn is roughly orientated east to west and could possibly represent a grave. The site is most likely the result of clearing agricultural fields.

Figure 60. Stone packed feature at KP10.

Figure 61. General site conditions at KP 10.

Heritage Significance: Low significance unless the site is confirmed to be a grave in which case it is of High Social Significance
Field Rating: GP C if confirmed to be a grave GP A

KP 19

Small thicket of large trees (Figure 62) with scattered stone features, glass and fence posts (Figure 63 – 65) underneath the trees. Could be possible graves or relating to clearing of agricultural fields.

Figure 62. Thicket of trees.

Figure 63. Stone cairn.

Figure 64.Artefacts on site.

Figure 65. Stone Cairn.

Heritage Significance: Low significance unless the site is confirmed to be a grave in which case it is of High Social Significance
Field Rating: GP C if confirmed to be a grave GP A

KP 20

Scattered stone feature (Figure 66 and 67) disturbed by farming. Purpose of the feature is unknown but could relate to clearing of agricultural fields.

Figure 66.Scattered stone feature.

Figure 67. Scattered stone feature.

Heritage Significance: Low significance unless the site is confirmed to be a grave in which case it is of High Social Significance
Field Rating: GP C if confirmed to be a grave GP A

8.2 Cultural Landscapes, Intangible and Living Heritage.

The study area is rural in character surrounded by agricultural and mining developments and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. From a heritage point of view the area has been extensively disturbed and this would have impacted on heritage resources. Visual impacts to scenic routes and sense of place are also considered to be low due to the existing developments in the area.

8.3 Battlefields and Concentration Camps

There are no battlefields or related concentration camp sites located in the study area.

9 Potential Impact

During the heritage assessment 22 sites were identified. Of these sites the proposed development will directly impact on 13 sites (Table 8)

Table 8. Sites that will be directly impacted by the development

SITE	DESCRIPTION	LONGITUDE	LATITUDE	IMPACT
KP 4	Graves	30° 00' 52.1028" E	26° 09' 42.6708" S	Preferred Plant Area
KP 5	Graves	30° 00' 44.4671" E	26° 09' 54.2413" S	Preferred Plant Area
KP 6	Ruin	30° 00' 39.9780" E	26° 09' 53.9927" S	Preferred Plant Area
KP 7	Graves	30° 00' 38.7179" E	26° 09' 54.1547" S	Preferred Plant Area
KP 8	Stone Cairn	30° 00' 51.0877" E	26° 09' 52.3693" S	Preferred Plant Area
KP 9	Ruin	30° 00' 27.8640" E	26° 09' 36.8425" S	Opencast Area
KP 12	Ruin	29° 59' 52.1701" E	26° 10' 03.1800" S	Opencast Area
KP 13	Ruin	29° 59' 56.0041" E	26° 10' 02.3303" S	Opencast Area
KP 18	Grave	29° 59' 43.0999" E	26° 10' 06.3001" S	Opencast Area
KP 19	Stone Cairn	30° 00' 54.0144" E	26° 08' 50.5465" S	Topsoil and Overburden Facility
KP 20	Stone Cairn	29° 59' 02.0219" E	26° 10' 22.3393" S	Opencast area
KP 21	Ruin	29° 59' 47.2199" E	26° 10' 08.3028" S	Opencast Area
KP 22	Ruin	29° 59' 50.3557" E	26° 10' 08.1408" S	Opencast Area

The chances of impacting unknown archaeological sites in the study area is considered to be negligible. If the correct mitigation measures are implemented, impacts on the identified heritage features and graves can be avoided or mitigated to an acceptable level. Structures older than 60 years are protected by the NHRA and should be mitigated prior to development. Any direct impacts that did occur would be during the construction phase only with secondary impacts on sites that will be retained and preserved. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any significant heritage resources directly. However, this and other projects in the area could have an indirect impact on the heritage landscape.

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

No impact is envisaged for the recorded heritage resources during this phase.

9.1.3.1 Impact on Archaeological Features

Three archaeological features were identified that will not be impacted on by the development (Figure 68).

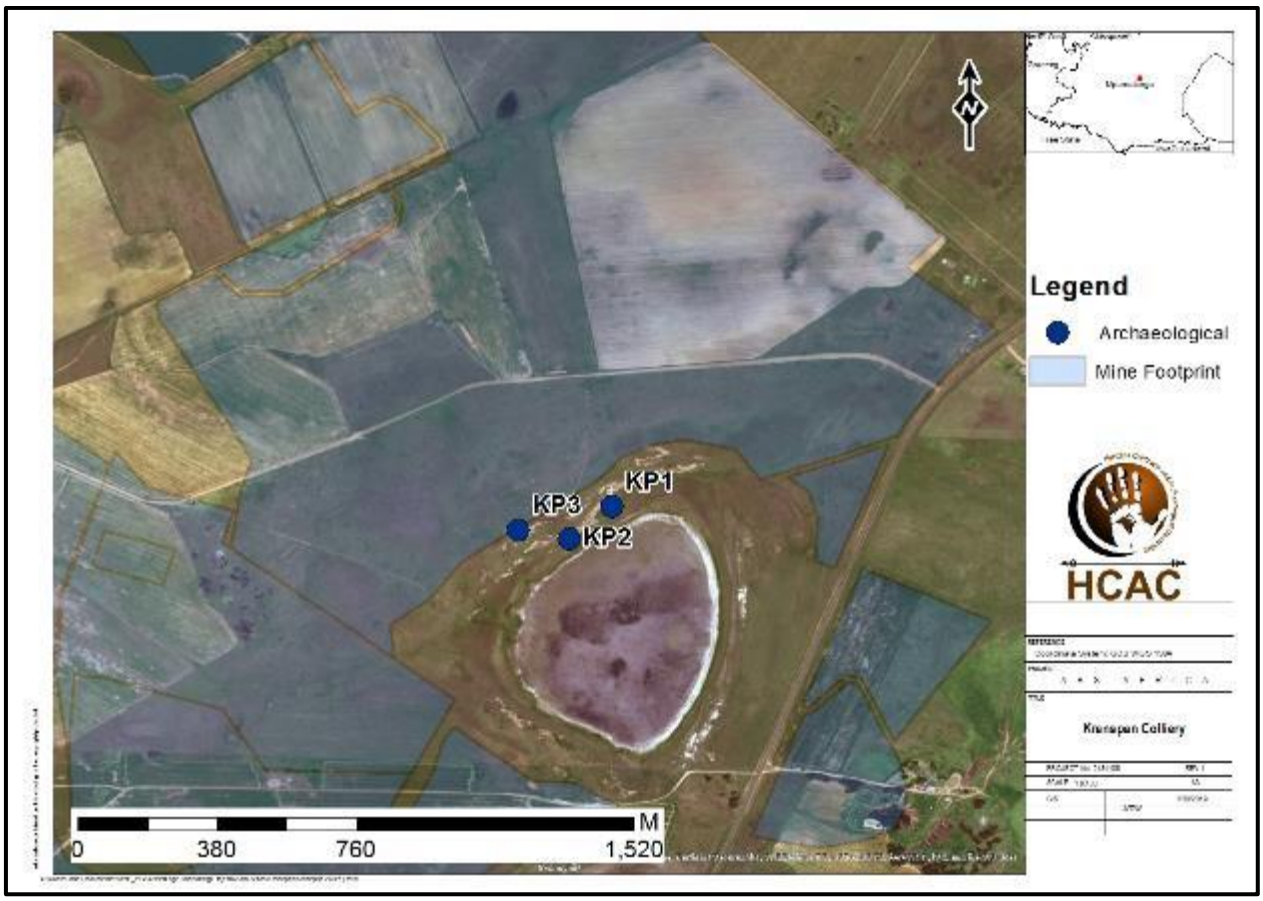

Figure 68. Location of recorded archaeological features.

Table 9. Impact Assessment on known archaeological heritage resources

Nature: During the earth moving 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 (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not Probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Due to the lack of apparent significant archaeological resources in the impact area no further mitigation is required prior to construction. A Chance Find Procedure should be implemented for the project should any sites be identified during the construction process. The known sites should be mapped to protect them from accidental damage.		
Cumulative impacts: Since the surrounding area is characterised by agricultural developments and due to the lack of heritage resources that will be impacted on in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

9.1.3.2 Impact on recorded structures

Nine ruins were identified in the study area of which 6 will be directly impacted on by the proposed development (Figure 69).

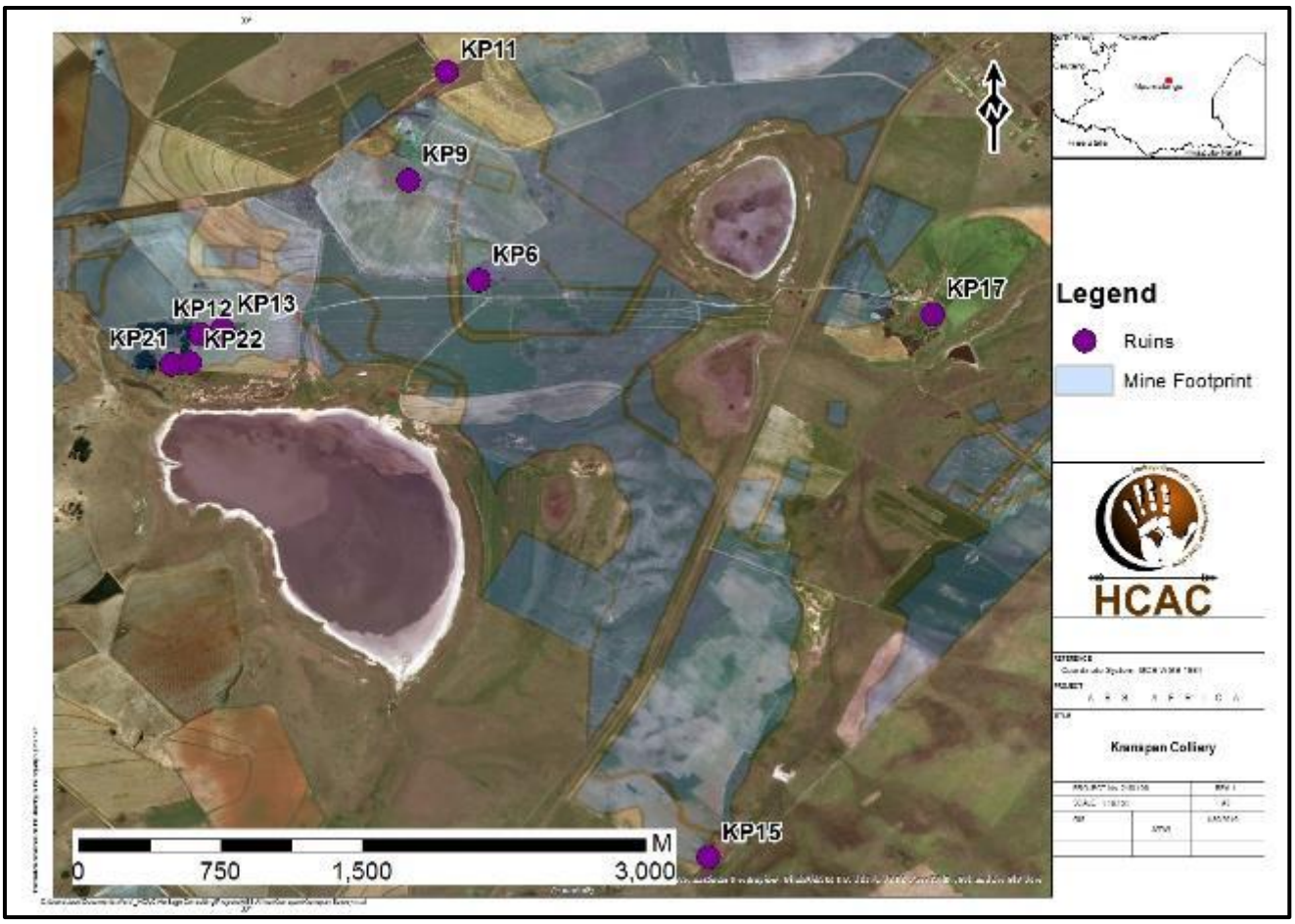

Figure 69. Location of the recorded structures.

Table 10. Impact assessment on structures older than 60 years.

Nature: During earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position heritage material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Definite (5)	Probable (3)
Significance	**40 (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	Yes
Mitigation: The structures are of low to moderate significance, but are protected by the heritage act due to their age. It is recommended that if impacted on the sites should be assessed by a conservation architect after which a destruction permit can be applied for adhering to all legal requirements. A chance find procedure should be implemented for the project.		
Cumulative impacts: Since the surrounding area is characterised by agricultural developments and due to the lack of significant heritage resources that will be impacted on in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of heritage record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

9.1.3.3 Impact on recorded cemeteries

During the survey 6 cemeteries were identified and the proposed development will have a direct impact on 4 of the cemeteries (Figure 70).

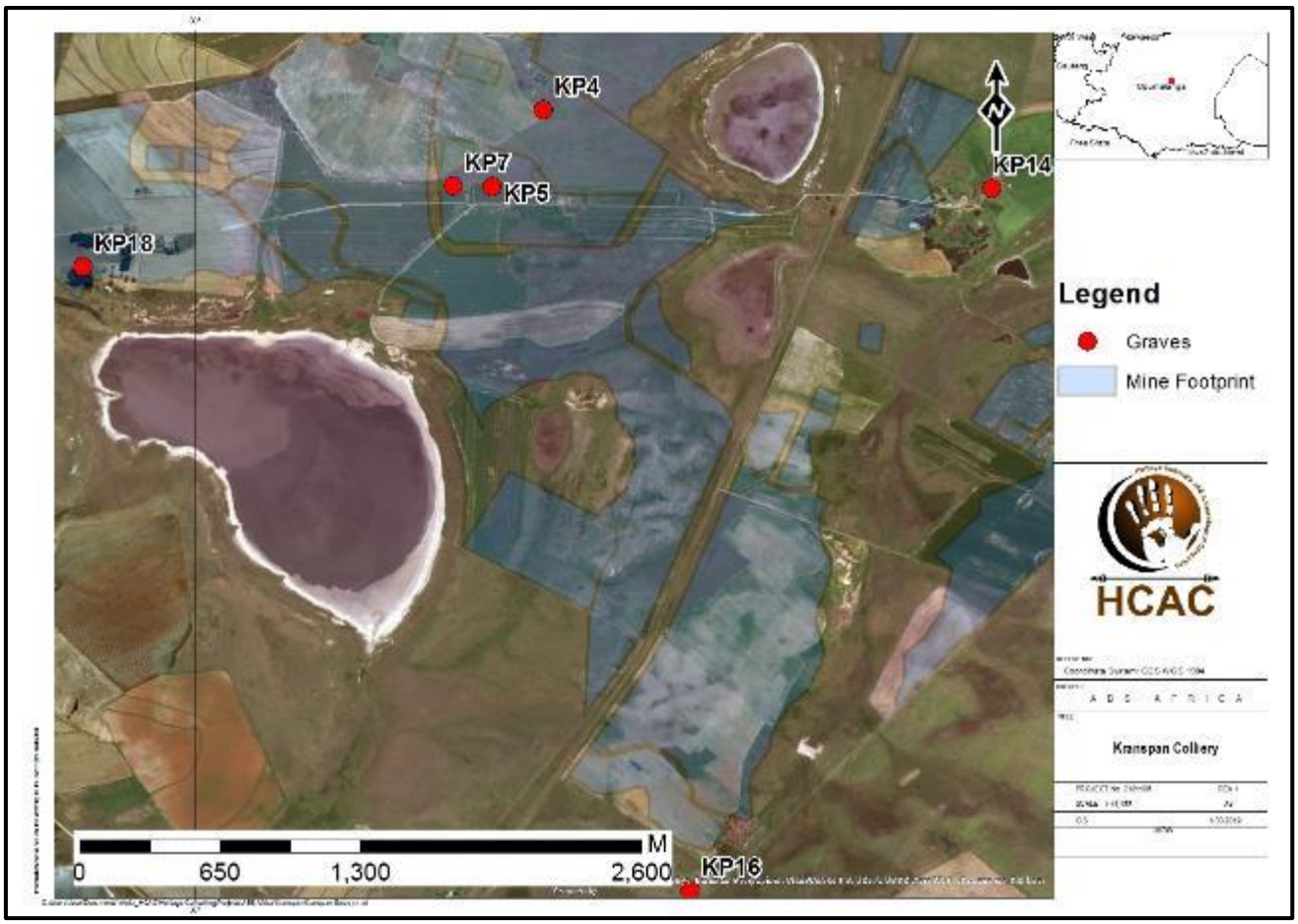

Figure 70. Location of recorded cemeteries.

Table 11 Impact Assessment on recorded graves

Nature: During earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position graves and burial sites.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (4)	Low (2)
Probability	Definite (5)	Not probable (2)
Significance	**60 (Medium - High)**	**20 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: Graves and cemeteries are of high social significance, it is recommended that the cemeteries should be demarcated and preserved *in situ.* If this is not possible the graves can be relocated adhering to all legal requirements. A chance find procedure should be implemented for the project.		

9.1.3.4 Impact on Stone Cairns

Three of the four identified stone cairns will be impacted on by the development (Figure 71).

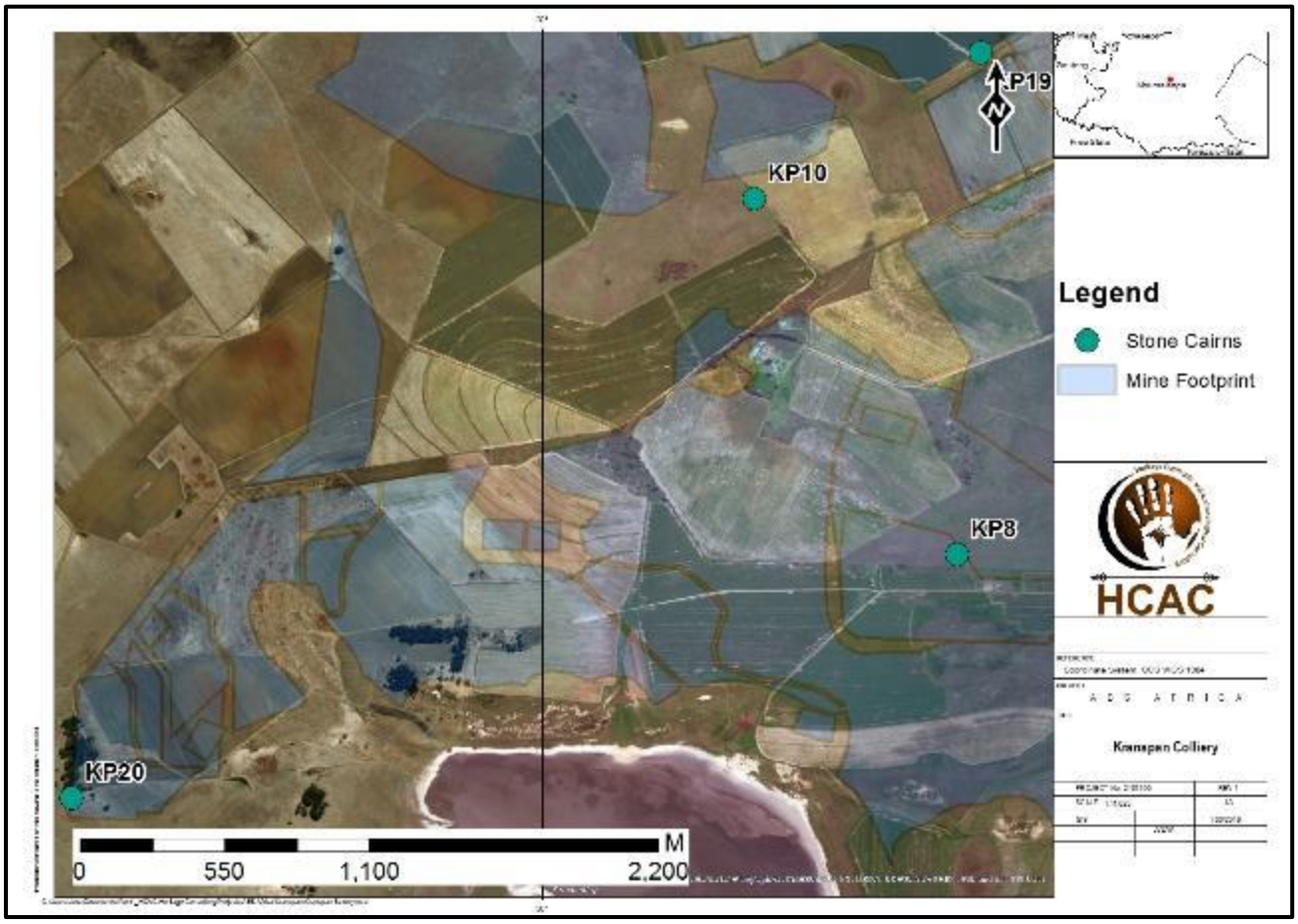

Figure 71. Identified Stone Cairns in the study area.

Table 12. Impact assessment for Stone Cairns in the study area

Nature: During earth moving activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position graves and burial sites.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (4)	Low (2)
Probability	Definite (5)	Not probable (2)
Significance	**60 (Medium – High)**	**20 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: If the cairns are related to clearing activities the features are of low significance and no further mitigation is required. It is recommended that the presence of graves should be confirmed by the social team. Graves and cemeteries are of high social significance, it is recommended that if confirmed to be graves the cairns should be demarcated and preserved *in situ.* If this is not possible the graves can be relocated adhering to all legal requirements. A chance find procedure should be implemented for the project.		

9.1.4 Impact on Wash Plant Alternatives

Three wash plant alternatives were considered (Figure 72). The impact of the three alternatives on heritage resources is summarised in Table 13 and the impact on identified sites is indicated in Figure 73.

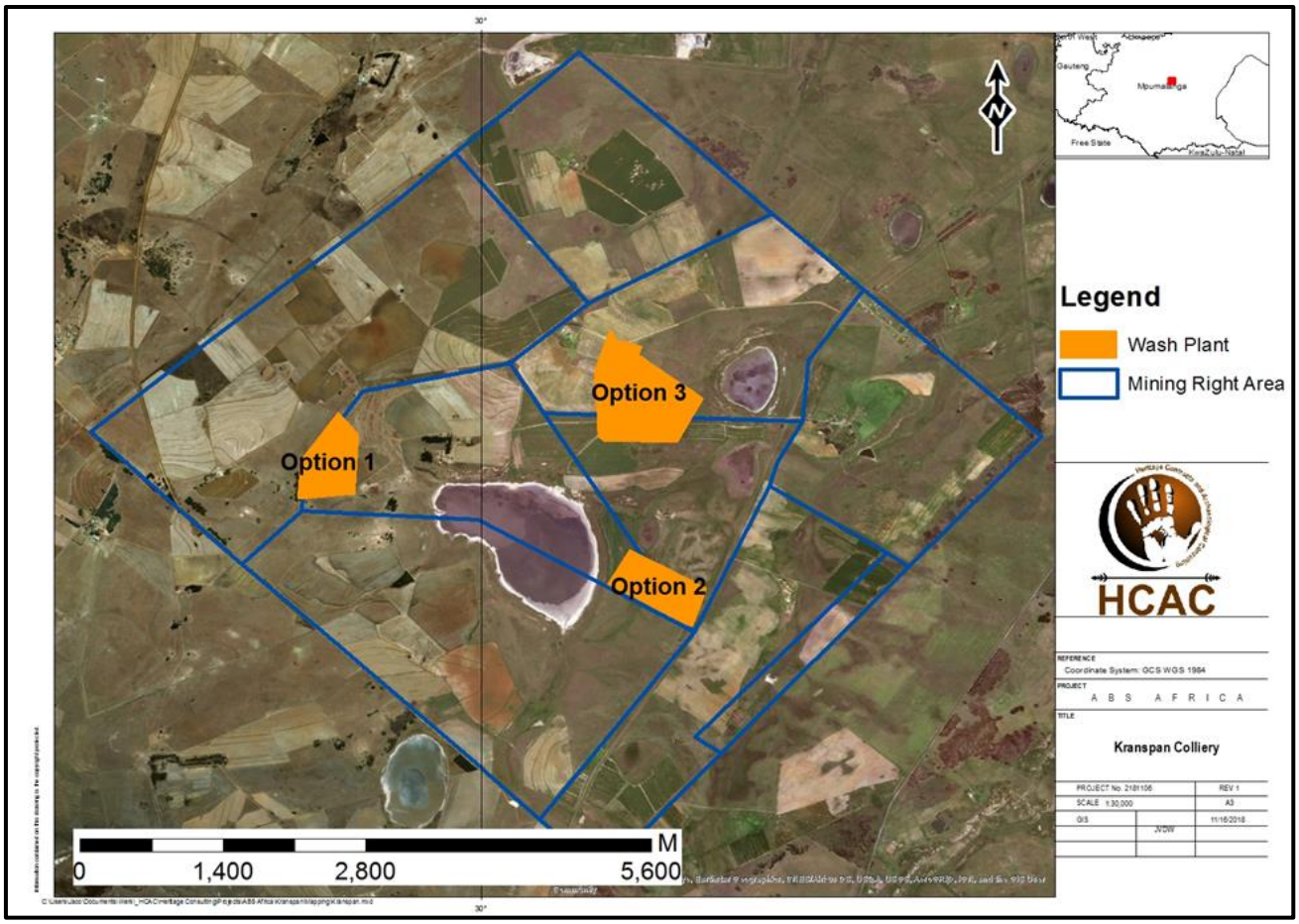

Figure 72. Wash plant Alternatives

Table 13. Impacts on heritage resources by the three wash plant alternatives

Option	Option 1	Option 2	Option 3
Impact	Indirect impact on a Stone Cairn	No direct or indirect impact on known heritage sites.	Direct impact on KP 4, 5,6,7 and 8 (Figure 73).
Acceptable/ Not acceptable	**Acceptable** it the correct mitigation measures are implemented.	**Preferred option**	From a heritage point of view this option is the **least preferred alternative.**

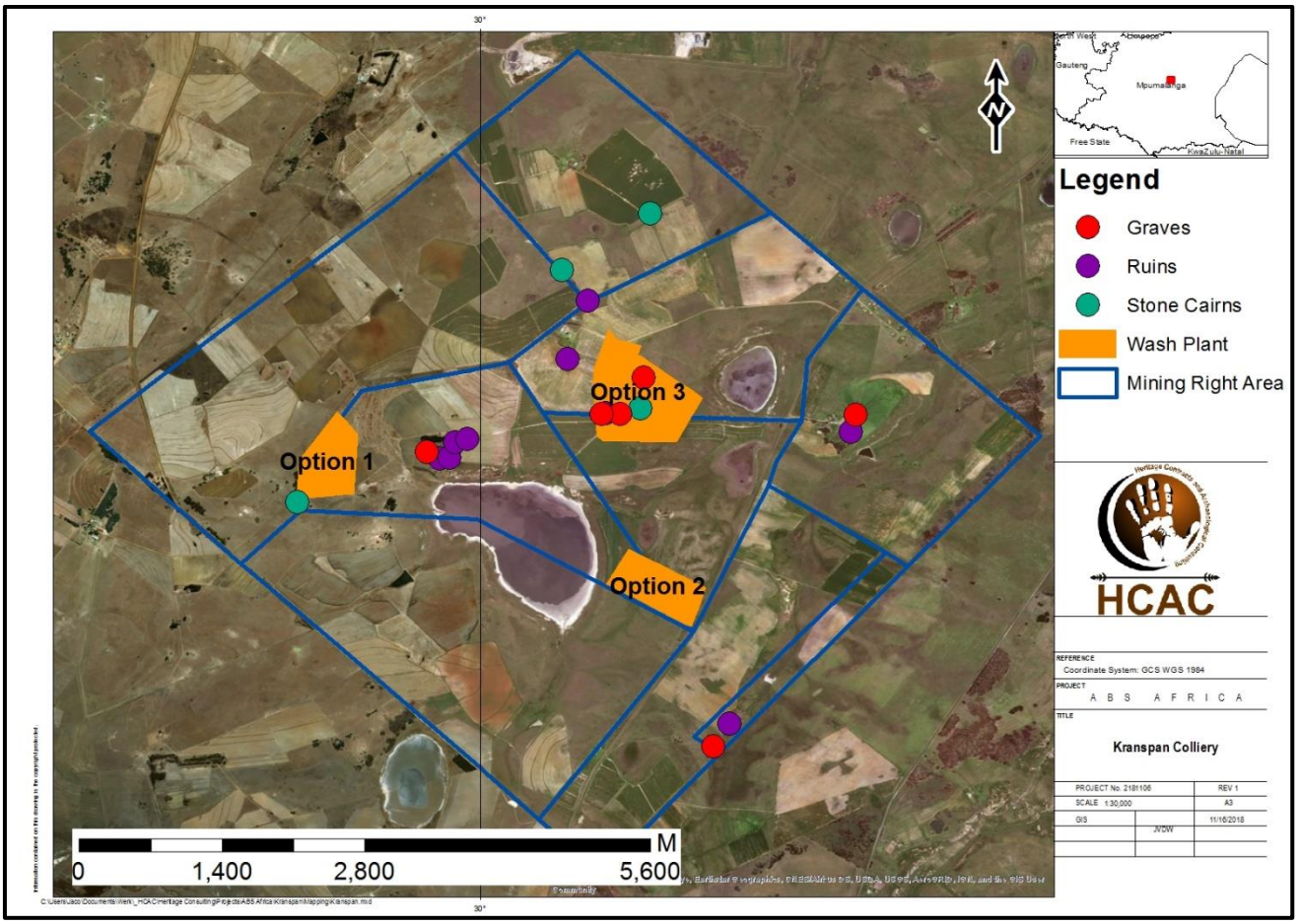

Figure 73. Sites as indicated in relation to wash plant alternatives.

Table 14. EMPR management measures

OBJECTIVE: To preserve and mitigate non-renewable heritage resources in the study area.

Project component/s	Heritage resources can be impacted on during earth moving activities by the project.
Potential Impact	Irreplaceable loss of heritage resources and accidental damage to burial sites in the study area as well as depletion of the archaeological database of the area.
Activity/risk source	Activities such as vegetation clearing and earth moving activities could destroy recorded resources.
Mitigation: Target/Objective	A heritage site development plan incorporated into the environmental management plan that considers heritage resources in the event of any future extensions of infrastructure or identification of heritage resources in current operations. *In situ* preservation of known graves.

Mitigation: Action/control	Responsibility	Timeframe
• A Consultation process to determine if any graves or still born burials exist in and around the structures must be conducted	Social team/ Community Liaison officer	Prior to earth works
• Implement a Chance Finds Procedure to ensure that if any heritage resources are uncovered that these are reported and correctly mitigated.	ECO	Daily
• The historic structures should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.	Kranspan Colliery	Prior to development
• Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;	Kranspan Colliery	Prior to development
• Implementation of a chance find procedure	Kranspan Colliery	Life of Mine
• Implementation of paleontological protocols (Millsteed 2019)	Kranspan Colliery and ECO	Life of Mine

Performance Indicator	• Graves should be retained *in situ/* relocated adhering to legal requirements. • Heritage impacts should be considered in any future development in the area.

	• Ongoing preservation of retained sites. • Implementation of a chance find procedure i.e. immediate reporting to relevant heritage authorities of any heritage feature discovered during any phase of development or operation of the facility.
Monitoring	The ECO should monitor the known heritage resources during construction and the possible occurrence of subsurface heritage resources regularly.

10 Recommendations and conclusion

HCAC was appointed to conduct a Heritage Impact Assessment for the Kranspan Colliery to determine the presence of cultural heritage sites and the impact of the proposed project on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the footprint of the proposed mine.
The mining right area is located on nine portions of the Farm Kranspan 49IT, Mpumalanga Province, approximately 13 km south-west of the town of Carolina. The planned operations entail both surface and underground mining as well as the establishment of various mine support infrastructure within the proposed mining right area.

The study area is characterised by extensive maize fields that have been cultivated from prior to 1966. These agricultural activities would have impacted on surface indicators of heritage sites. However, several sites were still intact and recorded during the survey (Table 2).

In terms of the built environment (Section 34 of the NHRA) nine ruins were recorded (KP 6, KP 9, KP 11, KP 12, KP 13, KP 15, KP 17, KP 21, KP 22). Apart from KP 11, 15 and 17 that will not be directly impacted on the other ruins are all located in the preferred plant and opencast area. Although these ruins' potential to contribute to aesthetic, historic, scientific and social aspects is low, if confirmed to be older than 60 years these features are protected by legislation and must be assessed by a conservation architect.

Archaeological remains are sparse throughout the study area and three sites (KP 1, 2 & 3) were recorded centred around pans. These sites consist of a scatter of Stone tools, possible rock art and a small shelter. Fortunately, these sites are within environmental buffer zones around the pans and will not be directly impacted on. An independent paleontological study (Millsteed 2019) found that it is evident that the proposed mining operations pose a risk of negatively impacting upon scientifically highly significant fossil assemblages and damage mitigation protocols are required. Detailed recommended control mitigation measures are included in Section 10 of this report.

In terms of Section 36 of the Act six cemeteries (KP 4, KP 5, KP 7, KP 14, KP 16, KP 18) were recorded. Four of the cemeteries are located in the pit and wash plant area and will be directly impacted on (KP 4, 5, 7 and 18). Two of the cemeteries could be indirectly impacted on. It is recommended that these cemeteries should be retained *in situ*, with a 50 m buffer zone and demarcated with an access gate where possible. If this is not possible these cemeteries can be relocated adhering to legislation. More graves/ cemeteries can be expected in the mining right area and if any additional graves are identified they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

No public monuments are located within or close to the study area. The study area is rural in character with an emphasis on agriculture with several mining operations next to the current study area and although it is not a significant cultural landscape the proposed mining can have a negative impact on the sense of place. During the public participation process conducted for the project no heritage concerns were raised.

The impact of the proposed project on heritage resources is considered low to medium and impacts can be mitigated to an acceptable level. The greatest risk to the project is the location of known and unknown graves. It is therefore recommended that the proposed project can commence (from a heritage perspective) on the condition that the following recommendations are implemented as part of the EMPr together with site specific recommendations and based on approval from SAHRA:

- The historic structures (KP 9, 12, 17, 21 and 22) should be assessed by a conservation architect if they are to be impacted on by the development who will make suitable recommendations for mitigation, after which a destruction permit can be applied for from the relevant heritage authority.
- The cemeteries located in the pit and wash plant area (KP 4,5,7 and 18) will be directly impacted on. It is recommended that these cemeteries are preserved *in situ*, fenced with an access gate for family members, with a 50-meter buffer zone. If this is not possible the cemeteries can be relocated adhering to all legal requirements.
- The cemeteries KP 14 and 16 could be indirectly impacted by the development and it is therefore recommended that the cemeteries are preserved *in situ*, fenced with an access gate for family members, with a feasible buffer zone.
- The total number of graves should be confirmed prior to development.
- It is recommended that during the social consultation process to be undertaken by the mine Community Liaison Officer it should be confirmed whether the identified stone cairns represent graves (KP 8 and 20 are located within the impact area).
- Through the social consultation process, to be undertaken by the mine Community Liaison Officer, the existence of unknown and unmarked graves associated must be confirmed in order to mitigate any graves not identified in this study. The implementation of a chance find procedure is recommended.
- Implementation of a heritage site development plan to ensure the protection of heritage resources within the mining area;
- Implementation of a chance find procedure

In terms of the palaeontological heritage the following recommendations apply:

During the construction phase of the mine:

- When the surface infrastructure elements of the mine are being constructed these locations must be regularly inspected to observe if the excavations have encountered bedrock of the Vryheid Formation.
- These regular inspections should be made by a suitable mine employee (such as the environmental officer) who has been trained to identify the types of fossils that may reasonably be expected to occur within the Vryheid Formation.
- Should fossil materials be identified, the excavations must be halted in that area and SAHRA informed of the discovery. An experienced Karoo palaeontologist should be contacted by the mine to assess the significance of the fossils.
- If fossil materials prove to be scientifically significant the palaeontologist should make recommendations that they should be either be protected completely *in situ* or could have damage mitigation procedures emplaced (i.e., excavation by a suitability by a suitably experienced palaeontologist) to minimise negative impacts.

Once excavation of the opencast pit voids begins:

- On-site checks for the occurrence of any fossils of the excavated pits and stockpiled material should be conducted biannually (i.e., every six months).
- The frequency of these checks should be reassessed after twelve (12) months based on the findings.
- The Karoo palaeobotanist should submit a monitoring report to SAHRA on this work.

In addition,

- Should any fossil materials be identified, the palaeontologist should ascertain their scientific and cultural importance. Should the fossil prove scientifically or culturally significant the particular excavations involved should be halted and SAHRA informed of the discovery

- Should scientifically or culturally significant fossil material exist within the project areas any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

When the underground mining component of the mining program commences no damage mitigation protocols are recommended. The coals comprising Seam E are the product of a complex series of jellification and other coalification processes that transformed the original vegetation (peat) into coal. Recognisable plant macrofossil materials are not expected to be present within the coals. Such plant macrofossil materials may be present within any siliciclastic partings within the seam. However, the automatic mining machinery will destroy any such fossils before they can be recognised as being present. Similarly, modern industrial health and safety rules would make it extremely difficult for a palaeontologist to be able to access and work at a working mine face. Should scientifically or culturally significant fossil material exist within the project area any negative impact upon it could be mitigated by its excavation (under permit from SAHRA) by a palaeontologist and the resultant material being lodged with an appropriately permitted institution. In the event that an excavation is impossible or inappropriate the fossil or fossil locality could be protected and the site of any planned construction moved.

10.1 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 therefor 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.

10.2 Reasoned Opinion

From a heritage perspective, the proposed project is acceptable. If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the development will not impact negatively on the heritage record of the area.

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Appendix A
Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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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 Chloorkop 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 Booysendal 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 analysis 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:

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