NDI GEOLOGICAL CONSULTING SERVICES (PTY) LTD.: PROPOSED BMW, COLVILLE & ST AUGUSTINE SITES DEVELOPMENT, FRANCES BAARD DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Archaeological Impact Assessment

Prepared for: **NDI Geological Consulting Services (Pty) Ltd.**

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ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED BMW, COLVILLE & ST AUGUSTINE SITES DEVELOPMENT IN KIMBERLEY IN THE FRANCES BAARD DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

Conducted for:
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DOCUMENT DISTRIBUTION LIST

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DECLARATION

I, Nelius Le Roux Kruger, declare that –

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

Signature of Specialist
Company: Exigo Sustainability
Date: 28 July 2020

EXECUTIVE SUMMARY

This report details the results of an Archaeological Impact Assessment (AIA) study for the proposed BMW, Colville & St Augustine Sites Development in in Kimberley in the Frances Baard District Municipality, Northern Cape Province. The project forms part of the "Changing the Face of the City Project" which envisages the rehabilitation of open spaces in Kimberley by means of the establishment of housing, business and retail infrastructure in these open spaces. The report includes background information on the area's archaeology, its representation in Southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed.

Project Title	BMW, Colville & St Augustine Sites Development
Project Location	BMW Site: S28.741038° E24.747381° Colville Site: S28.718314° E24.756156° St Augustine Site: S28.736636° E24.749010°
1:50 000 Map Sheet	2824DA & 2824DB
Farm Portion / Parcel	Kimberley Townlands
Magisterial District / Municipal Area	Frances Baard District Municipality
Province	Northern Cape Province

A large number of archaeological and historical studies have been conducted in the Kimberly area. These studies all infer a rich and diverse archaeological landscape around the town and the Northern Cape Province, which encompasses a significant heritage legacy, mostly dominated by a rich historical Industrial frontier. The abundance of locally available raw material implies a prominent Stone Age presence and specifically Earlier Stone Age (ESA) and Middle Stone Age (MSA) artefacts occur widely in the area. A wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are also to be found in the larger landscape e.g. at Wildebeestkuil. Sites dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history.

An analysis of historical aerial imagery and archive maps of the project area subject to this assessment suggests a landscape which has been sparsely populated in historical times but the area was subjected to extensive industrialization and urban development, quarrying and digging towards the end of the 20th century during the Kimberly diamond rush and subsequent mine growth. The following recommendations are made based on general observations in the proposed BMW, Colville & St Augustine Sites Development in terms of heritage resources management:

- According to the South African Heritage Resources Agency Information System (SAHRIS) Palaeo Map, portions of the project area fall within a sensitive fossiliferous zone and a Palaeontological Assessment is recommended for the project, subject to review and recommendations by the relevant heritage authorities. Should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.
- Fragments of dated bottles and bottle necks, porcelain, glass and metal occur in random scatters at the project sites in refuse dumps. These artefacts were found in low densities in association with mining debris from the Historical Period. The St Augustine Mine located directly north-west of the Kimberley Mine, was in operation from the late 1890s until 1902. Later, the tailings of the Kimberley Mine were deposited over the St Augustine kimberlite and all indications of the mine disappeared. Some discarded mining areas became dumping areas for industrial and domestic waste which seems to be the case with the St Augustine, BMW and Colville Sites. Cognisant of the regional significance of the Historical Dumps at the BMW, Colville & St Augustine Sites, it is suggested that a representative sample of the middens be excavated in order to assess their significance before any further decision pertaining to heritage mitigation (for example potential Phase 2 archaeological specialist assessments) are taken. This measure should be undertaken subject to the relevant archaeological excavation permitting requirements from the competent heritage authority (SAHRA). In addition, destruction permits should be obtained from the relevant heritage authorities (SAHRA) prior to any impact on these sites.
- It is recommended that all planned activities should be carefully monitored by an archaeologist familiar with the archaeology and history of Kimberley on a regular basis (bi-monthly during initial site clearing and ground moving) in order to detect impact on the cemetery or any previously undetected heritage remains at the earliest opportunity. In addition, an informed ECO should inspect the construction sites on regular basis in order to monitor possible impact on heritage resources.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.
- Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

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

NOTATIONS AND TERMS/TERMINOLOGY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LIST OF ABBREVIATIONS

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

TABLE OF CONTENTS

LIST OF FIGURES

1 BACKGROUND

1.1 Scope and Motivation

Exigo Sustainability (Pty) Ltd (Exigo) was commissioned by NDI Geological Consulting Services (Pty) Ltd. to conduct an Archaeological Impact Assessment (AIA) for the proposed BMW, Colville & St Augustine Sites Development in the Northern Cape Province. The rationale of this AIA is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance in previously unstudied areas; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

1.2 Project Direction

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

1.3 Project Brief

NDI Geological Consulting Services (Pty) Ltd. has requested the Heritage Unit of Exigo Sustainability to conduct a Heritage Impact Assessment (HIA) for development activities and establishment of urban infrastructure at 3 sites in Kimberley in the Northern Cape Province (hereafter referred to as the "BMW, Colville & St Augustine Sites Development").

The proposed BMW, Colville & St Augustine Sites Development forms part of the larger Kimberley "Changing the Face of the City Project" which envisages the rehabilitation of open spaces by means of the establishment of housing, business and retail infrastructure in Kimberley in these open spaces (see Figure 1-2). The respective development areas measure:

- BMW Site: **20ha**
- Colville Site: **50ha**
- St Augustine Site: **12ha**

It is also envisaged that mining debris from rehabilitation of development sites subject to the Changing the Face of the City Project (BMW, Colville and St Augustine Sites) will be moved to the Roodepan Quarry site to be used as backfill for site stabilization.

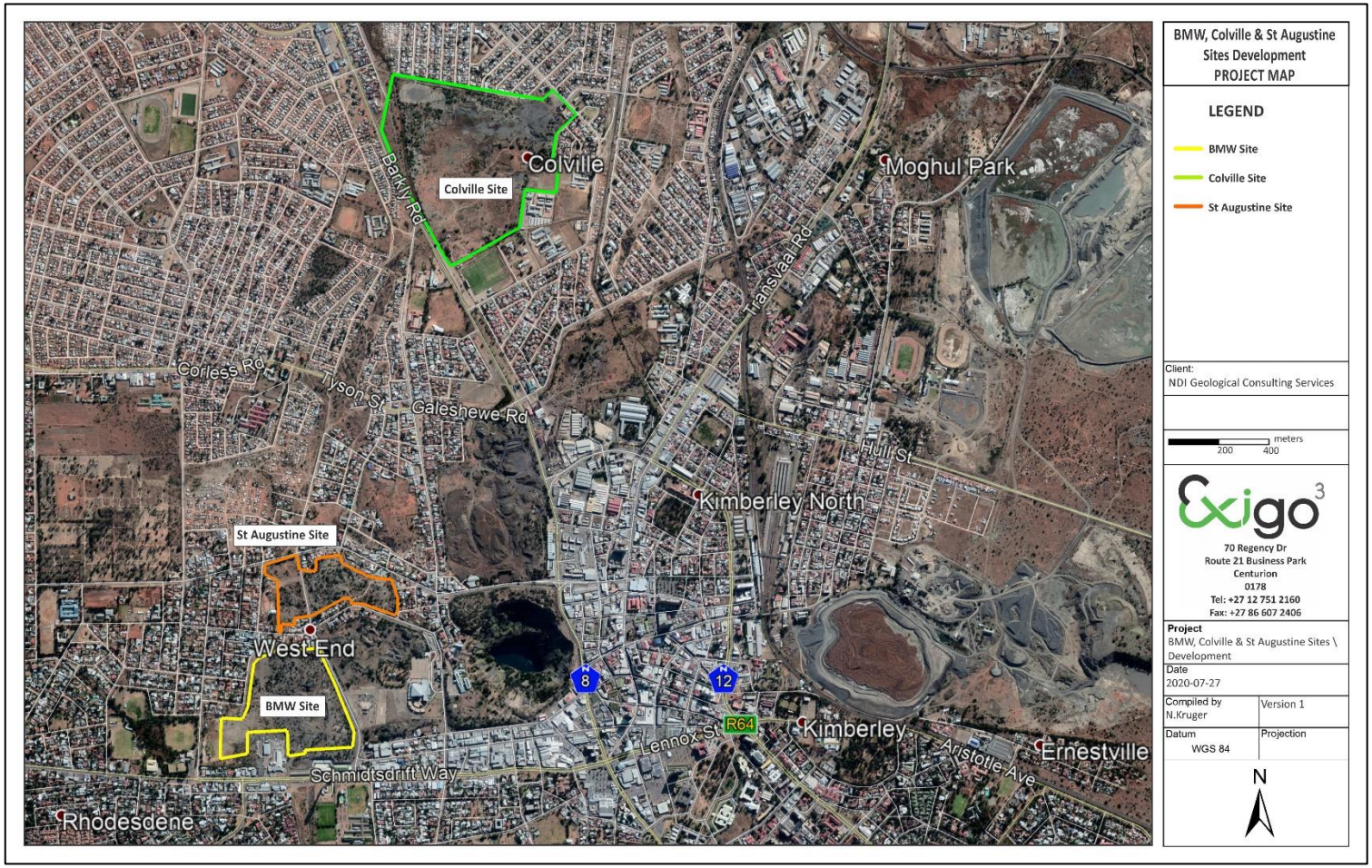

Figure 1-1: Aerial map indicating the project areas and sites subject to the proposed BMW, Colville & St Augustine Sites Development.

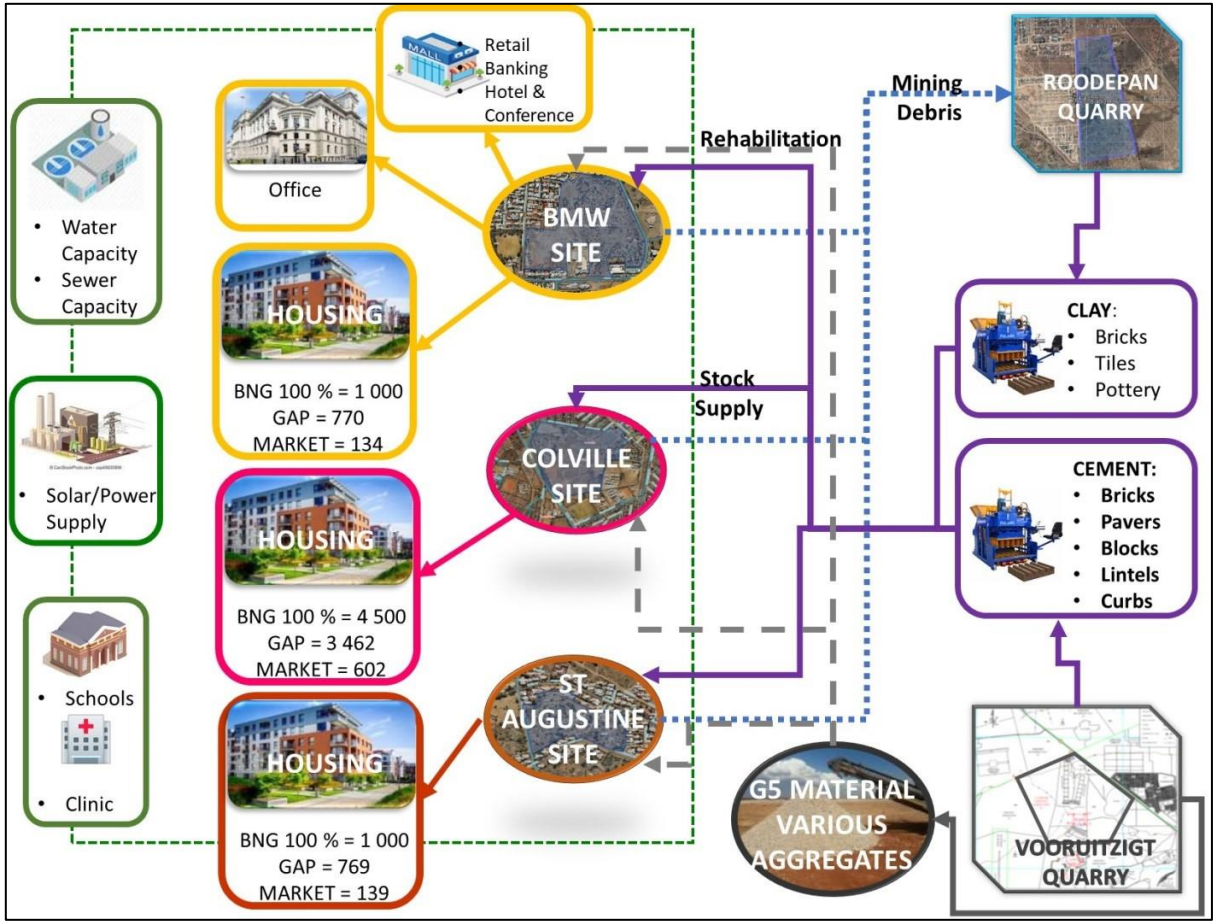

Figure 1-2: Diagram indicating the process flow for the proposed BMW, Colville & St Augustine Sites Development within the larger Kimberley Changing the Face of the City Project.

1.4 Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that, through the management of change, developments still conserve our heritage resources. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of heritage resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources. Based hereon, this project functioned according to the following **terms of reference for** heritage specialist input**:**

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements which may be affected, if any.*
- *Assess the nature and degree of significance of such resources within the area.*
- *Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;*
- *Assess and rate any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible heritage management measures provided that such action is necessitated by the development.*
- *Liaise and consult with the South African Heritage Resources Agency (SAHRA). A Notification of Intent to Develop (NID) will be submitted to SAHRA at the soonest opportunity.*

1.5 CRM: Legislation, Conservation and Heritage Management

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

1.5.1 Legislation regarding archaeology and heritage sites

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

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

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

a. Archaeological artefacts, structures and sites older than 100 years

b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography

c. Objects of decorative and visual arts

d. Military objects, structures and sites older than 75 years

e. Historical objects, structures and sites older than 60 years

f. Proclaimed heritage sites

g. Grave yards and graves older than 60 years

h. Meteorites and fossils

i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

a. Places, buildings, structures and equipment of cultural significance

b. Places to which oral traditions are attached or which are associated with living heritage

c. Historical settlements and townscapes

d. Landscapes and features of cultural significance

e. Geological sites of scientific or cultural importance

f. Archaeological and paleontological sites

g. Graves and burial grounds

h. Sites of significance relating to the history of slavery

i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

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

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

and

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

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

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

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

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

and

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

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

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

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

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

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

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

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

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

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

1.5.2 Background to HIA and AIA Studies

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

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

2 REGIONAL CONTEXT

2.1 Area Location

The proposed BMW, Colville & St Augustine Sites Development areas occurs directly north-west and north of the historical Kimberley Mine complex in the town of Kimberley in the Northern Cape Province. The BMW and St Augustine Sites occur in the West End is bordered to the south by St Augustines Road, and to the west by Waterloo Road. The Colville Site is situated in Colville which is bordered by Pniel Road. The project appears on 1:50000 map sheets 2824DA & 2824DB (see Figure 2-1) and the footprints occur at the following geographical locations:

- **BMW Site:** S28.741038° E24.747381°
- **Colville Site:** S28.718314° E24.756156°
- **St Augustine Site:** S28.736636° E24.749010°

2.2 Area Description: Receiving Environment

Kimberley lies within the Savanna biome which is the largest biome in Southern Africa. It is characterized by a grassy ground layer and a distinct upper layer of woody plants (trees and shrubs). The environmental factors delimiting the biome are complex and include altitude, rainfall, geology and soil types, with rainfall being the major delimiting factor. Fire and grazing also keep the grassy layer dominant. The most recent classification of the area by Mucina & Rutherford shows that the northern mountainous section of the site is classified as Ghaap Plateau Vaalbosveld, while the remainder of the site is classified as Schmidtsdrif Thornveld. The landscape features of the Schmidtsdrif Thornveld vegetation type are mostly a closed shrubby thornveld dominated by *Acacia mellifera* and *A. tortilis*. Apart from grasses, bulbous and annual herbaceous plant species are also prominent. The vegetation is sometimes very disturbed due to overgrazing. Surface limestone of Tertiary to Recent age and fine and coarse-grained dolomite, chert and dolomitic limestone with prominent interbedded chert, limestone and banded ironstone (Ghaap Plateau Formation), Campbell Group Soils associated with the site are mostly shallow Mispah or Glenrosa soil forms associated with dolomitic limestone, chert or calcrete.

2.3 Site Description

The St Augustine, BMW and Colville Sites are situated within urban boundaries of Kimberley and its suburbs. All of the sites show signs of recurring and considerable historical and recent surface disturbances and little original surface cover on the terrains remain. Surface and subsurface deposits at the sites are made up of a mix of mine debris, ash-heaps and domestic waste. Natural vegetation in the form of trees and surface grass occur in small pockets across some areas and a number of artificial wetlands and dams have formed in quarries – particularly at the Colville site. Large erosion gullies are prevalent across the sites and surfaces across the project areas have generally been degraded with refuse dumping occurring throughout. The Historical Kimberley Mine and many other historical monuments are situated within a radius of approximately 2km of the project areas. Other archaeological occurrences have been documented at a number of locales in the landscape immediately surrounding the respective project areas and particularly at mine dumps dating to Kimberley's Historical period.

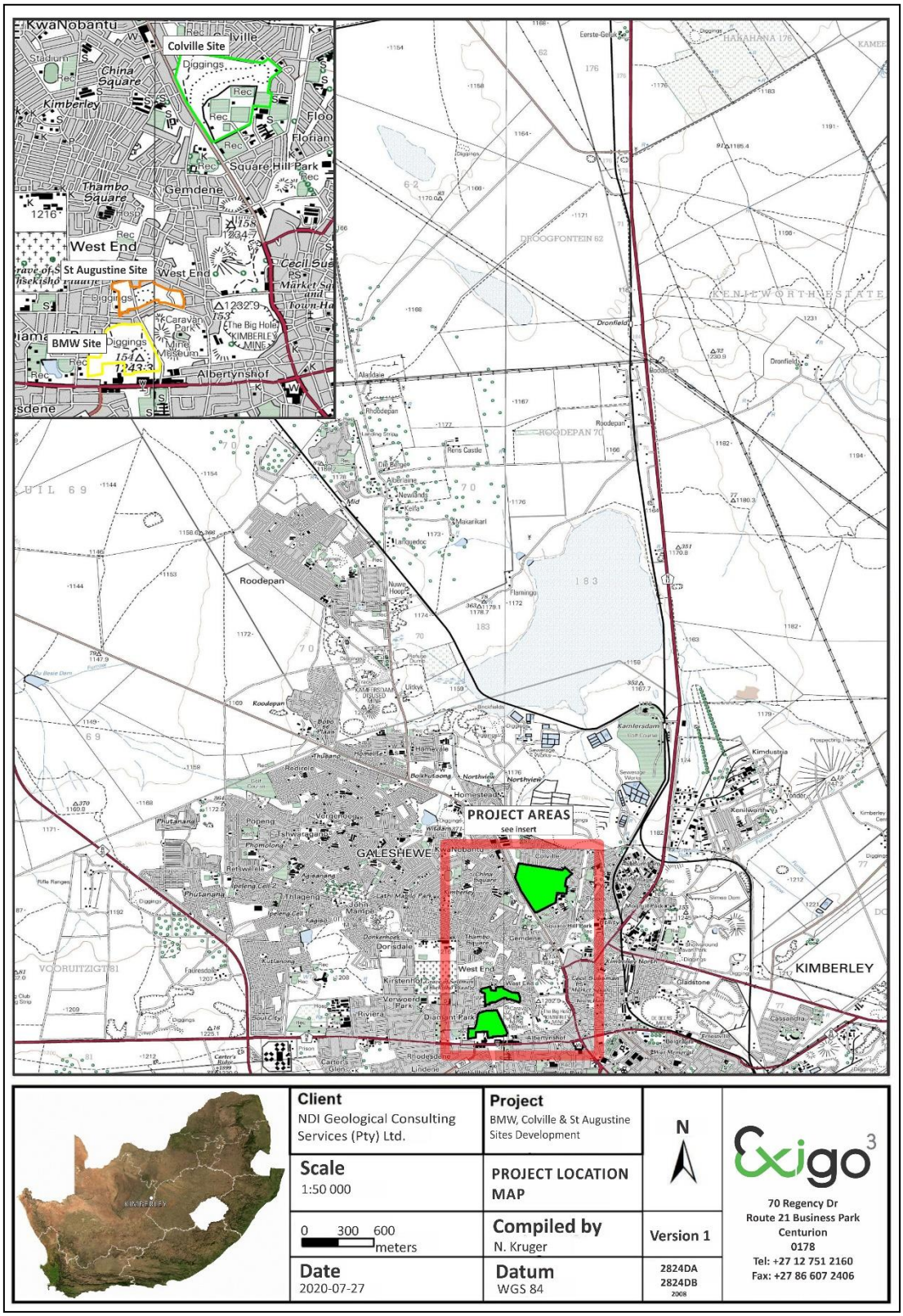

Figure 2-1: 1:50 00 Map representation of the location of the proposed BMW, Colville & St Augustine Sites Development (sheet 2824DA & 2824DB).

Figure 2-2: Aerial map providing a regional context for the proposed BMW, Colville & St Augustine Sites Development.

3 METHOD OF ENQUIRY

3.1 Sources of Information

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

3.1.1 Desktop Study

The larger landscape around Kimberley has been well documented in terms of its archaeology and history and available academic papers and research articles supplied a historical context for the proposed project and archival sources, aerial photographs, historical maps and local histories were used to create a baseline of the landscape's heritage. In addition, the study drew on available unpublished Heritage Assessment reports to give a comprehensive representation of known sites in the study area. According the South African Heritage Resources Agency (SAHRA), A large number of heritage studies have been conducted in the larger Kimberley area. Many of these studies have emanated from Impact Assessment measures for EIA purposes commissioned by the private sector. Some of the studies include:

- Beaumont, P.B. 2002. Archaeological Report: Construction of a Temporary Bridge across the Vaal River at Windsorton, Erf 1, for Floodplain (Island) Diamond Reclamation.
- Beaumont, P.B. 2005a. Archaeological Impact Assessment of a Portion of the Remnant of Farm 225, near Barkly West, Northern Cape.
- Beaumont, P.B. 2005b. Archaeological Impact Assessment of a Portion of the Delportshoop Commonage, Northern Cape.
- Beaumont, P.B. 2006. Phase 1 Heritage Assessment Report on Portion 4 of the Farm Slypklip North 32, Frances Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2007a. Phase 1 Heritage Impact Assessment Report on Parts of Portion 2 and the Remainder of the Farm Holsdam 229 near Barkly West, Frances Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2007b. Phase 1 Heritage Impact Assessment Report on the Farm Eureka 200 near Kimberley, Francis Baard District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008. Phase 1 Heritage Impact Assessment Report on the Proposed Northgate Housing development on Portions of the Original Farm Roode Pan 70, near Kimberley in the Sol Plaatjie Municipality of the Northern Cape Province.
- Dreyer, C.2003. Archaeological and Historical Investigation of the Proposed Pipeline Installed at Hanover, Northern Cape.
- Dreyer, C. 2005a. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farm Riverside 208, Barkly West, Northern Cape.
- Dreyer, C. 2005b. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farms Melkvlei 221 and Longlands 231, Barkly West, Northern Cape.
- Dreyer, C. 2005c. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Development on Erven 687 and 711, Barkly West, Northern Cape.
- Dreyer, C. 2006a. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Developments at the Big Hole, Kimberley, Northern Cape.
- Dreyer, C. 2006b. Archaeological and Historical Investigation of the Proposed Diamond Mining Activities at the Farm Winter's Rush (Longlands 350), Barkly West, Northern Cape.
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3.1.2 Remote Sensing

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

3.1.3 Field Survey

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of the BMW, Colville & St Augustine Development area was conducted in August 2020. The process encompassed a systematic field survey in accordance with standard archaeological practice by which heritage resources are observed and documented. In order to sample surface areas systematically and

to ensure a high probability of site recording, the project site was carefully examined by means of a foot survey. GPS reference points identified during the aerial survey were also visited and random spot checks were made (see detail in previous section). Using a Garmin GPS, the survey was tracked and general surroundings were photographed with a Samsung Digital camera. Real time aerial orientation, by means of a mobile Google Earth application was also employed to investigate possible disturbed areas during the survey.

3.2 Limitations

3.2.1 Access

The BMW and St Augustine Sites are accessed directly from Midlands Road, St Augustines Road and Waterloo Road. The Colville Site is accessed from Pniel Road. Access control is not applied to the areas relevant to this assessment and no restrictions were encountered during the site visit.

3.2.2 Safety

Since access control is not applied to the project area and human movement, refuse dumping and informal settlement - particularly at the Colville site - are prevalent. An inevitable consequence is that the areas are unsafe and security proved to be a limitation in this study – particularly in terms of free movement. However, based on general observations in the study area as well as observations from aerial photos, the author is confident that the heritage potential of the project area has been adequately captured in this assessment.

3.2.3 Visibility

The surrounding vegetation in the study areas is mostly comprised out of grasslands and scattered trees and pioneering and wetland species in landscapes that have largely been transformed by refuse dumping and quarrying activities. Visibility proved to be a constraint in the more pristine north of the project area (see Figures 3-1 to 3-12). In single cases during the survey sub-surface inspection was possible. Where applied, this revealed no archaeological deposits.

Figure 3-1: View of the BMW Site, note overgrown refuse and mind dumps.

Figure 3-2: Refuse dumping visible across the BMW Site.

Figure 3-3: View of general surroundings at the BMW Site.

Figure 3-4: View of old dumps and refuse heaps covered in tall grasses at the BMW Site.

Figure 3-5: View of number of artificial wetlands and dams which have formed in quarries as a result of stormwater wash and leaking water infrastructure at the Colville Site.

Figure 3-6: View of the Colville Site, note exposed refuse deposits and dumps.

Figure 3-7: View of old dumps and refuse heaps covered in tall grasses at the Colville Site.

Figure 3-8: View of dumps which are currently reprocessed by artisanal miners at the Colville Site.

Figure 3-9: View of large degraded mine dumping areas in the St Augustine Site.

Figure 3-10: View of degraded mine dumping areas along an eastern section of the St Augustine Site.

Figure 3-11: Large erosion gullies at the St Augustine Site.

Figure 3-12: Refuse dumping visible across the St Augustine Site.

3.2.4 Summary: Limitations and Constraints

The site survey for the BMW, Colville & St Augustine Sites Development AIA primarily focused around areas tentatively identified as sensitive and of high heritage probability (i.e. those noted during the aerial survey) as well as areas of high human settlement catchment. In summary, the following constraints were encountered:

- **Visibility:** Visibility proved to be a constrain in areas with denser surface cover as well as portions where vegetation is more pristine.
- **Free Movement:** The project areas, and particularly the Colville Site, was considered a risk in terms of personal safety and this constrained free movement in these areas.

It should be noted that, even though it might be assumed that survey findings are representative of the heritage landscape of the project area for the Project, it should be stated that the possibility exists that individual sites could be missed due to the localised nature of some heritage remains as well as the possible presence of sub-surface archaeology. Therefore, maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent all the heritage resources present in the project area. The subterranean nature of

some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

3.3 Impact Assessment

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

4 ARCHAEO-HISTORICAL CONTEXT

4.1 The archaeology of Southern Africa

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

Table 1 Chronological Periods across Southern Africa

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

[1] Plomp, H.,2004

4.2 Discussion: The Kimberley Heritage Landscape

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age occurrences. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Sites dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. Finally, the Northern Cape Province saw a number of war conflicts, particularly the Anglo Boer War (or the South African War) left behind the remnants of battlefields, skirmishes and concentration camps.

4.2.1 Early History and the Stone Ages

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and *Homo habilis* have been found in dolomite caves and underground dwellings in the Riverton Area at places such as Sterkfontein and Swartkrans near Krugersdorp. Homo habilis, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles. The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with *Homo erectus*, who manufactured hand axes and cleavers from as early as one and a half million years ago. Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and point s that may have had long wooden sticks as hafts and were used as spears.

The Northern Cape has traces of various types of archaeological sites inclusive of fossil, prehistoric and historical sites. Of palaeontological and Stone Age significance is a major fossil-bearing and archaeological complex of karstic deposits at Groot Kloof in the escarpment of the Ghaap Plateau, around 100 km southwest of Taung. The region is known for open fluvial and lacustrine sites sampling Lower and Middle Pleistocene tool types and the long, but discontinuous sequence of Wonderwerk Cave. Small pockets of Later Stone Age artefact-bearing breccia and rock art also occur. The significance of Groot Kloof is underscored by current debate about the emergence of modern humans in which the appearance of modern behaviour is posited to have occurred in this and other regions (Curnoe et al. 2005). The Stone Age archaeological wealth of the Northern Cape is unequalled by any of the other provinces in South Africa. Stone Age sites are not randomly scattered within the landscape and they occur either near water sources or close to local sources of two highly-prized raw materials, specularite and jaspilite. As such, tools dating to all phases of the Stone Age are mostly found in the vicinity of larger watercourses. Surveys around Kimberley have documented Acheullian industries and continuity between Earlier Stone Age (ESA) and Middle Stone Age (MSA) lithic technologies in the same area. Excavations at other well-known sites in the wider region attest to further ESA and MSA occupation, some of which have yielded have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape and the

Northwest (e.g. see Beaumont 2008, 2009; Morris 2006; Morris 2007; Dreyer 2007). Within the greater Kimberley region ESA and MSA sites with long research histories include Doornlaagte, Pniel, Canteen Koppie and Rooidam (Beaumont & Morris 1990). Open air ESA and MSA sites are often associated with raw material outcrops, dolines, playas (palaeo-lakes) and palaeo-river channels. In addition low density ESA, MSA and Later Stone Age (LSA) occurrences remain regular phenomena characterizing the cultural landscape of the region. LSA use of the more immediate region is most prominently evidenced by the Wildebeest Kuil Rock Art Center and adjoining Rock Art site (see later reference) . Here, a number of lithic artefacts with spatial distribution indicative of separate residential and knapping areas occur around the hill. The landscape around the town of Kimberley is rich in archaeological material dating to Earlier and Middle Stone Ages. These are subject to on-going archaeological research Sites such as Wonderwerk Cave, Historical Kimberley Mine and Kathu Townlands have yielded significant Stone Age assemblages that all inform on our general understanding of the technological sequences of the Stone Age in the Northern Cape (e.g. see Beaumont 2008, 2009; Morris 2006; Morris 2007; Dreyer 2007). In addition, a large amount of Middle and Later Stone Age sites have been documented across the landscape on calcrete lined pans and road cuttings.

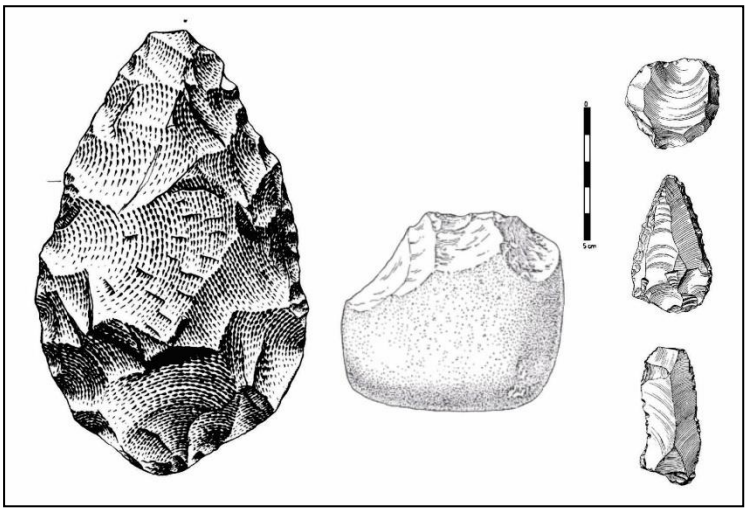


Figure 4-1: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

4.2.2 The Later Stone Age (LSA) and Rock Art

The Late Stone Age commenced twenty thousand years ago or somewhat earlier. The various types of Later Stone Age industries scattered across the country are associated with the historical San and Khoi-Khoi people. The San were renowned as formidable hunter-gatherers, while the Khoi-Khoi herded cattle and small stock during the last two thousand years. Late Stone Age people manufactured tools that were small but highly effective, such as arrow heads and knives. Later Stone Age (LSA) sites occur both at the coast and inland as caves deposits, rock shelters, open sites and shell deposits. Rock engravings are mostly found in the interior plateau of South Africa for example in Kimberley and the Karoo. Evidence exists of rock art paintings occurring in caves and shelters at the Wonderwerk Caves, Kuruman Hills, Ghaap Escarpment and scattered sites in the Karoo. Rock engravings have also been identified at Driekopseiland that is positioned in the close vicinity of Kimberley Town. Driekopseiland is evident of more than ninety percent of geometric engraving sites (Morris 1988). Geometrics have been identified at the Kuruman valley and the middle Orange area (Morris 1988). Engravings tend to be found at rock walls, low outcrops, or clusters of surface stone. The Wildebeest Kuil 1 Rock Art site, a declared Provincial Heritage Site (2008), is characterized by a fairly prominent hill surrounded by a number of 'kuils' or non-perennial water holes and wetlands. The hill itself is host to more than 400 petroglyphs, including both naturalistic and abstract engravings, in fine-line and pecked technique. LSA deposits are scattered about the immediate terrain with deposits closer to the hill indicative of residential outlines and activity or knapping areas. Extensive LSA use of the landscape is

evidenced by even more engravings on the glacial pavements of the farm Nooitgedacht, just north of Platfontein. Further afield the Driekopseiland site, one of the most prolific engraving sites in the country is host to more than 3,600 images, engraved into the glaciated andesite of the Riet River's banks (Morris 1990a). Closer to the Vaal River, at the Bushmans' Fountain site, Klipfontein, more than 4,500 engravings have been recorded across the approximate 9ha site (Morris 1990b). The many petroglyph sites across the Northern Cape signal an aesthetic and spiritual expression of a modern LSA cognition. The LSA archaeological record is directly associated with San history, dating conservatively back to around 40-27kya, whilst the Khoe is reported to have entered the country around 2kya (Mitchell 2002). Both groups are known to have traded with Later Iron Age communities and Colonial settlers.

Figure 4-2: Rock engravings at the Wildebeest Kuil Rock Art Site.

Rock engravings are mostly situated in the semi-arid plateau with most of these engravings situated at the Orange – Vaal basin, Karoo and Namibia. The upper Vaal, Limpopo basin and eastern Free State regions have a small quantity of rock engravings as well. Generally, rock paintings exist at cave areas and rock engravings at open surface areas. The Cape interior consists of a technical, formal and thematic variation between and within sites (Morris 1988). Two major techniques existed namely the incised and pecked engravings. Morris (1988) indicated technical and formal characteristics through space and a sharp contrast exists between engravings positioned north of the Orange River that are mostly pecked and those in the Karoo where scraping was mostly used. According to Morris (1988) hairline engravings occur at the North and the South, but they are rare at the Vryburg region. Finger painting techniques mostly occur at the Kuruman Hills, Asbestos Mountains, Ghaap Escarpment, Langeberg, Koranaberg ranges, scattered sites at the Karoo and the Kareeberge (Morris 1988). The development petroglyphs (i.e. carving or line drawing on rock) were associated with three different types of techniques, namely incised fine lines, pecked engravings and scraped engravings. According to Peter Beaumont the pecked and scraped engravings at the Upper Karoo are coeval (i.e. having the same age or date of origin) (Beaumont P B et al. 1989). Dating of rock art includes the use of carbonate fraction dating of ostrich eggshell pieces, dating of charcoal and ostrich eggshell at various rock art shelters. Unifacial points, double segments and thin – walled sherds may indicate the presence of the Khoikhoi at the Northern Cape during 2500 BP (years Before the Present) (Beaumont 1989).

4.2.3 Iron Age / Farmer Period

The beginnings of the Iron Age (Farmer Period) in Southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry),

metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Iron Age people moved into Southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. From the coast they followed the various rivers inland. Being cultivators, they preferred rich alluvial soils. The Iron Age can be divided into three phases. The Early Iron Age includes the majority of the first millennium A.D. and is characterised by traditions such as Happy Rest and Silver Leaves. The Middle Iron Age spans the 10th to the 13th Centuries A.D. and includes such well known cultures as those at K2 and Mapungubwe. The Late Iron Age is taken to stretch from the 14th Century up to the colonial period and includes traditions such as Icon and Letaba. The beginnings of the Iron Age (Farmer Period) in southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. Stone ruins indicate the occurrence of Iron Age settlements in the Northern Cape specifically at sites such as Dithakong where evidence exists that the Thlaping used to be settled in the Kuruman – Dithakong areas prior to 1800 (Humphreys 1976). Here, the assessment of the contact between the Stone Age, Iron Age and Colonial societies are significant in order to understand situations of contact and assimilation between societies. As an example, Trade occurred between local Thlaping Tswana people and the Khoikhoi communities. It means that the Tswana traded as far south as the Orange River at least the same time as the Europeans at the Cape (Humphreys 1976).

4.2.4 Historical and Colonial Times

The Historical period in Southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in Southern Africa. The 18th century was defined as a period of conflict when the Griqua, Korana and white settlers were competing for the availability of land. This period is also known for the occurrence of the Mfecane or the so called Difaqane that resulted in a time period of instability that started in the middle 1820's. The conflict time period related to the Mfecane or Difaqane was the result of the influx of the then displaced people. The continuous conflict resulted in tribal groups migrating to hilltop areas in the need of finding safe environments. From early Colonial times interest in the Northern Cape was firmly vested in its mineral wealth; early settlers speculated about mountains rich in copper towards the north-west. However, the landscape was permanently transformed after Erasmus Jacobs discovered a 'brilliant pebble' on the farm De Kalk near Hopetown in 1866. The 'pebble' was sold to Schalk van Niekerk, who again sold it, only to turn out to be the 21.25 carat world famous '*Eureka'* diamond. Three years later van Niekerk sold another diamond from the De Kalk region, this time to become known as the *'Star of South Africa'*, resold on the London market for .25,000. In 1871 an even larger diamond was found on the slopes of Colesberg Kopje, on the farm Vooruitzight, belonging to the De Beers brothers and so the 'New Rush' was started resulting in a literal stampede to the area; more than 3,000 men working almost 800 claims. Soon the Colesberg hillock lowered into the Kimberley Mine (the Big Hole).

4.2.5 The Anglo-Boer War

The Anglo-Boer War saw Kimberley besieged by the *Boers* on the 14th of October 1899, with British forces suffering heavy losses. The Boers moved quickly to try to capture the British enclave when war broke out between the British and the two Boer republics in October 1899. The town was ill-prepared but the defenders organised an energetic and effective improvised defense that was able to prevent it from being taken. Cecil John Rhodes, who had made his fortune in the town, and who controlled all the mining activities,

moved into the town at the onset of the siege. His presence was controversial, as his involvement in the Jameson Raid made him one of the primary protagonists behind war breaking out. Rhodes was constantly at loggerheads with the military, but he was nonetheless instrumental in organising the defense of the town. The Boers shelled the town with their superior artillery in an attempt to force the garrison to capitulate. Engineers of the De Beers company manufactured a one-off gun named Long Cecil, however the Boers soon countered with a much larger siege gun that terrified the residents, forcing many to take shelter in the Kimberley Mine. The British military had to change its strategy for the war as public opinion demanded that the sieges of Kimberley, Ladysmith and Mafeking be relieved before the Boer capitals were assaulted. The first attempt at relief of Kimberley under Lord Methuen was stopped at the battles of Modder River and Magersfontein. The 124-day siege was finally relieved on 15 February 1900 by a cavalry division under Lieutenant-General John French, part of a larger force under Lord Roberts. The battle against the Boer general Piet Cronjé continued at Paardeberg immediately after the town itself was relieved.

Figure 4-3: Map indicating main events surrounding the siege of Kimberley.

4.2.6 The Kimberley Mine

The first diamonds here were found on Colesberg Kopje by members of the "Red Cap Party" from Colesberg on the farm Roodepan belonging to the De Beers brothers, in 1871. The ensuing scramble for claims led to the place being called New Rush, later renamed Kimberley. From mid-July 1871 to 1914 up to 50,000 miners dug the hole with picks and shovels, yielding 2,720 kilograms (6,000 lb) of diamonds. The Big Hole has a surface of 17 hectares (42 acres) and is 463 metres (1,519 ft) wide. It was excavated to a depth of 240 metres (790 ft), but then partially infilled with debris reducing its depth to about 215 metres (705ft). Since then it has accumulated about 40 metres (130 ft) of water, leaving 175 metres (574 ft) of the hole visible. Once above-ground operations became too dangerous and unproductive, the kimberlite pipe of the Kimberley Mine was also mined underground by Cecil Rhodes' De Beers company to a depth of 1,097 metres (3,599 ft). In 1872, one year after digging started, the population of the camp of diggers grew to around 50,000. As digging progressed, many men met their deaths in mining accidents. The unsanitary conditions, scarcity of water and fresh vegetables as well as the intense heat in the summer, also took their toll. On 13 March 1888 the leaders of the various mines decided to amalgamate the separate diggings into one big mine and one big company known as De Beers Consolidated Mines Limited, with life governors such as Cecil John Rhodes, Alfred Beit and Barney Barnato. This massive company further worked on the Big Hole until it came to the depth of 215 meters, with a surface area of about 17 hectares and perimeter of 1.6 kilometers. By 14 August 1914, when over 22 million tons of earth had been excavated, yielding 3,000 kilograms (14,504,566 carats) of diamonds, work on the mine ceased after it was considered the largest hand-dug excavation on earth. By 2005, however, it was reported that a researcher had re-examined mine records and found that the hand-dug portions of the Jagersfontein and Bultfontein diamond mines, also in South Africa, may have been deeper and/or larger in excavated volume.

Figure 4-4: Historical photo dating to the last decade of the 19th century, of the big hole excavation at the Kimberly Mine.

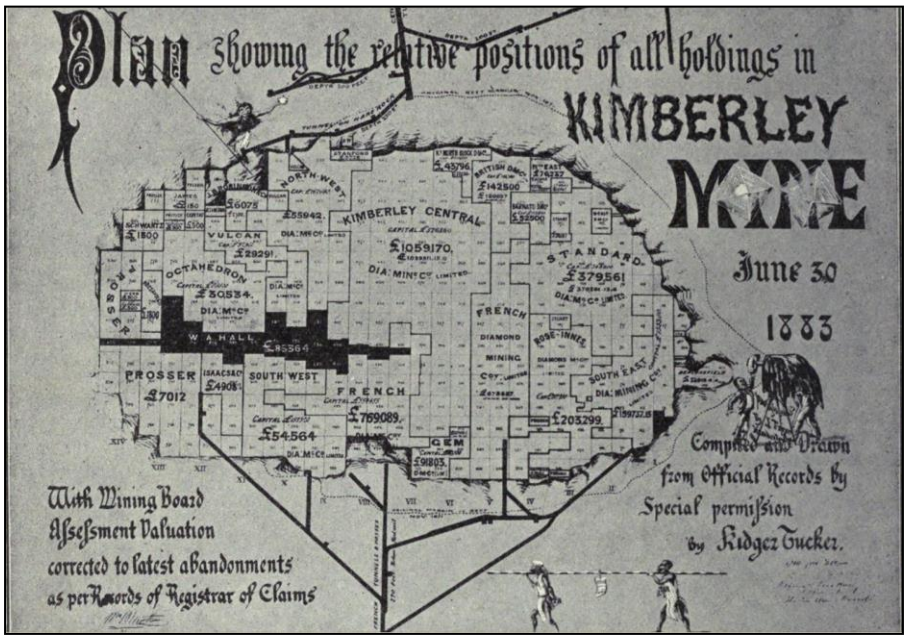


Figure 4-5: Historical plan of mine digging holdings at the Kimberley Mine c. 1883.

4.2.7 The St Augustines Mine

The St Augustines Mine located directly north-west of the Kimberley Mine was in operation from the late 1890s until 1902 to a depth of approximately 240 meters. Historical reference to the mine is few and far between but geological records indicate that the diamond quality of minerals from St. Augustines Mine was considered identical and the grade similar to that of the Big Hole, which, until 1914, produced 14.5 million carats of diamonds from 22.5 million tonnes at a grade of 64 carats per hundred tonnes. Records also indicate that the kimberlite pipes of the Big Hole and St Augustines are located on the same structure and are connected by a kimberlite fissure. Mining at St Augustines ceased in 1902 and records indicate that that the 240m deep St Augustines was only partially mined. It is said that the mine was closed in a strategic move to monopolise diamond production and limit diamond mining to the Kimberley Mine. Subsequently the tailings of the Kimberley Mine were deposited over the St Augustines kimberlite and all indications of the mine disappeared.

PRODUCTION OF DIAMONDS.

ST. AUGUSTINE'S MINE.

From January 1st to December 31st, 1887.

Date.	Carats.	Valuation.	Average per Carat.
January ...	Nil.	Nil.	Nil.
February ...	,,	,,	,,
March ...	,,	,,	,,
April	135	£200	29/7½
May	62	£50	16/1½
June	Nil.	Nil.	Nil.
July	,,	,,	,,
August ...	,,	,,	,,
September ...	,,	,,	,,
October ...	,,	,,	,,
November ...	,,	,,	,,
December ...	,,	,,	,,
Totals ...	197	£250 0 0	25/4½

PRODUCTION OF DIAMONDS.

ST. AUGUSTINE MINE.

From January 1st, 1886, to December 31st, 1887.

Date.	No. Carats.	Valuation.	Average per Carat.
1886	239½	£324 6 6	27/1
1887	197	250 0 0	25/4½
Totals ...	436½	£574 6 6	26/4½

Figure 4-6: Summary of diamond production at St Augustines Mine in 1887 (Mitchell 1888).

5 RESULTS: ARCHAEOLOGICAL SURVEY

5.1 The Off-Site Desktop Survey

A large number of archaeological and historical studies have been conducted in the Kimberly area. These studies all infer a rich and diverse archaeological landscape around the town and the Northern Cape Province, which encompasses a significant heritage legacy, mostly dominated by a rich historical Industrial frontier. The abundance of locally available raw material implies a prominent Stone Age presence and specifically Earlier Stone Age (ESA) and Middle Stone Age (MSA) artefacts occur widely in the area. A wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are also to be found in the larger landscape e.g. at Wildebeestkuil. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. The landscapes around Kimberly have been sparsely populated in past centuries but the town has seen major industrial and urban expansion with the discovery of diamonds towards the end of the 19th century. This resulted in the transformation of the landscape by quarrying, refuse dumping, site clearing and development. A careful analysis of historical aerial imagery and archive maps reveals the following (see Figure 5-2 to Figure 5-4) indicate that the BMW, Colville Site and St Augustine Sites existed in the landscape for the past century in association with the Kimberley and St Augustine Mines.

5.2 The Archaeological Site Survey

An analysis of historical aerial imagery and archive maps of the project area subject to this assessment suggests a landscape which has been sparsely populated in historical times but the area was subjected to urban development and extensive quarrying and digging towards the end of the 19th century. The following observations were made during the archaeological site survey:

- In this landscape, Industrial Archaeological traces often occur in association with former mining activity associated with the diamond retrieval process up to 1914, particularly with respect to the Kimberley Mine and smaller De Beers Mines. Also associated are mine dumps, some of which were used for redoubts (forts) in the Defence of Kimberley during the Siege, 1899-1900. Some discarded mining areas subsequently became dumping areas for industrial and domestic waste and the Kimberley Mayor's Minutes for the year 1898 record agitation for a “better system than the haphazard and unsatisfactory removal of refuse by private persons that had been in existence for some years” (Brits 1993: Morris 1994). Similarly, at the project sites, single fragments of dated bottles and bottle necks, porcelain, glass and metal occur in random scatters. These artefacts were found in low densities in association with mining debris from the Historical Period. The St. Augustines Mine located directly north-west of the Kimberley Mine, was in operation from the late 1890s until 1902. Later, the tailings of the Kimberley Mine were deposited over the St Augustine kimberlite and all indications of the mine disappeared. Some discarded mining areas became dumping areas for industrial and domestic waste which seems to be the case with the St Augustine, BMW and Colville Sites. Even though the mine dumps hold intrinsic heritage value on a regional scale in terms of the larger Kimberley industrial and mining landscape, on a local site level the context of artefacts has been adversely compromised lost due to the state of preservation of the sites and the recurring alteration of surface deposits. However, the St Augustine, BMW and Colville Sites are situated within a significant historical Kimberley Mine Complex and material within intact site contexts are considered to be of medium significance.

Figure 5-1: Glass fragments and mining debris visible on the surface at the BMW Site.

Figure 5-2: A porcelain fragment (left) and a glass bottle base from the refuse dump at the BMW Site.

Figure 5-3: A glass vase base from the refuse dump at the BMW Site.

Figure 5-4: A porcelain fragment from the refuse dump at the Colville Site.

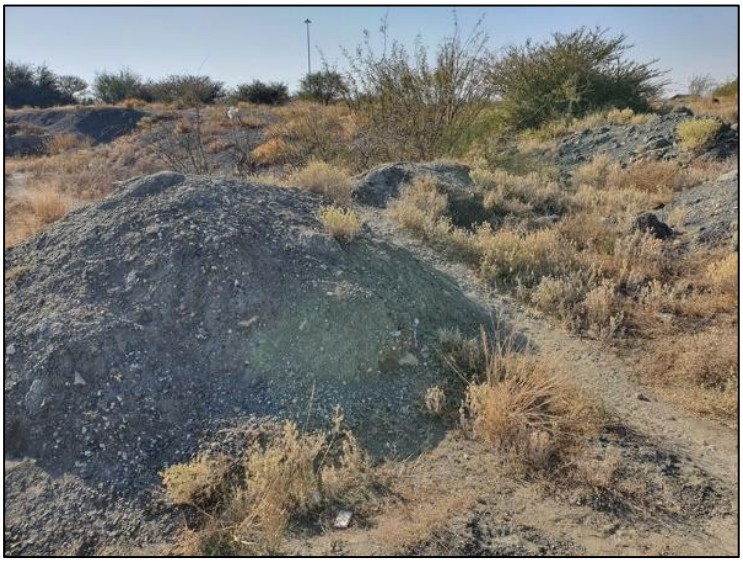


Figure 5-5: View of refuse dumps at the Colville Site.

Figure 5-6: A glass bottle top and other glass fragments from the St Augustine Site.

Figure 5-7: A glass bottle top fragment from the St Augustine Site.

Figure 5-8: Glass fragments and vitrified charcoal from the St Augustine Site.

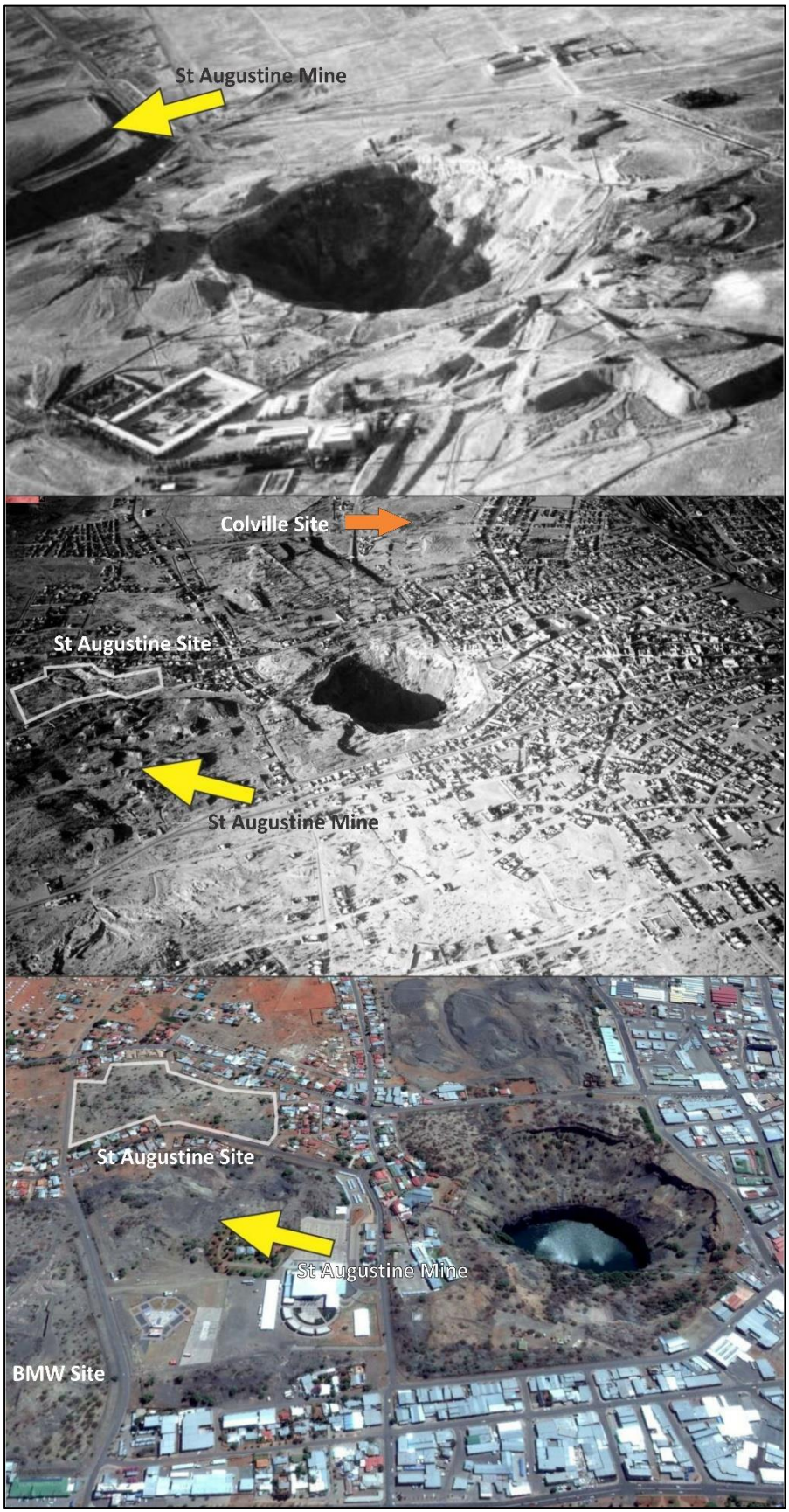
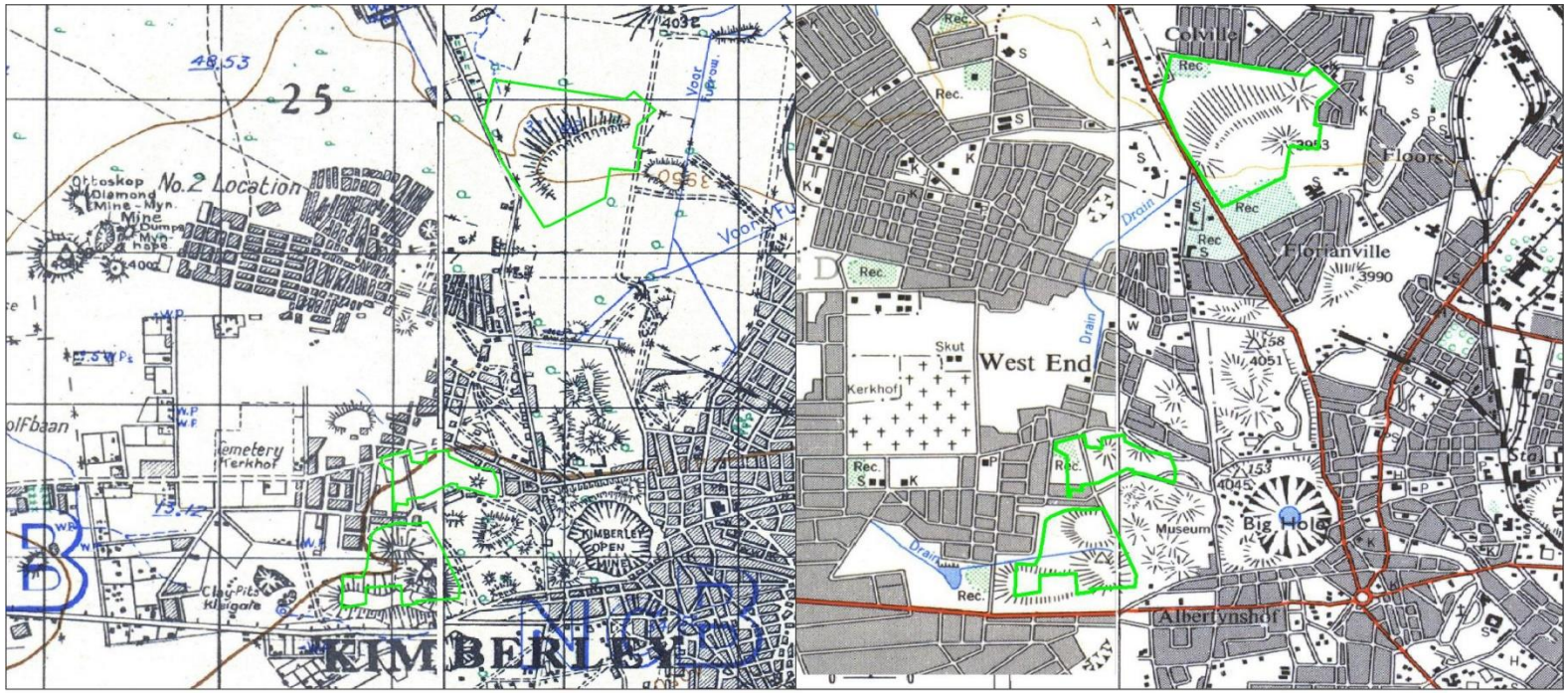


Figure 5-9: A series of photographs of the Kimberley mine area dating to the early 1900's (top), the 1930's (middle) and a recent image (bottom). The original location of the St Augustines Mine and the MW Site, the Colville Site and the St Augustine Site are indicated in the landscapes.



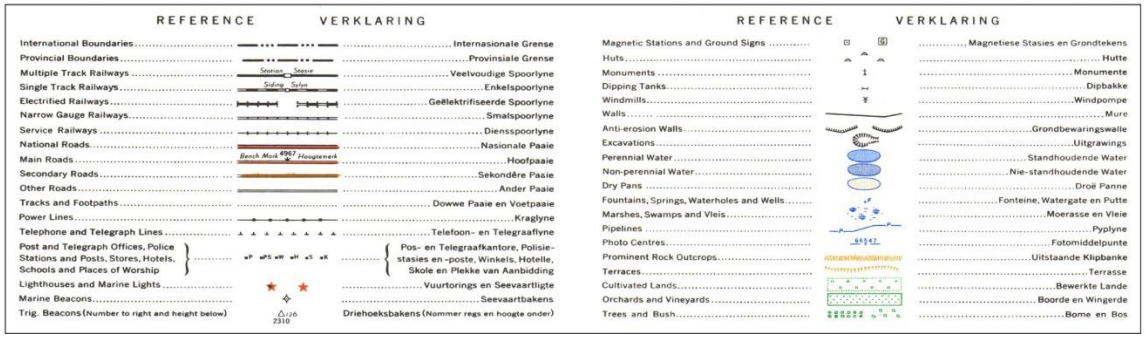


Figure 5-10: Historical topographic maps (1941 left and 1968 right) of the Kimberley area indicating the project areas (green outlines) in the past decades.

6 RESULTS: STATEMENT OF SIGNIFICANCE AND IMPACT RATING

6.1 Potential Impacts and Significance Ratings[2]

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

6.1.1 General assessment of impacts on resources

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

6.1.2 Direct impact rating

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

The following table summarizes impacts to the Historical Period middens of **mdeium** significance located within the project area:

NATURE OF IMPACT: Impacts could involve displacement or destruction of structures or features in the proposed Project area.		
	Without mitigation	**With mitigation**
EXTENT	Local	Local
DURATION	Permanent	Permanent
MAGINITUDE	Minor	Minor
PROBABILITY	Definite	Negligible
SIGNIFICANCE	Medium	Low
STATUS	Negative	Neutral
REVERSIBILITY	Non-reversible	Non-reversible
IRREPLACEABLE LOSS OF RESOURCES?	Yes	No

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

CAN IMPACTS BE MITIGATED?	N.A
MITIGATION: Site sampling, Site monitoring by ECO, destruction permitting if and when required.	
CUMULATIVE IMPACTS: No cumulative impact is anticipated.	
RESIDUAL IMPACTS: n/a	

6.2 Evaluation Impacts

Archaeological and historical research have been conducted in the Kimberley area and the landscape holds a rich and diverse archaeological landscape and cognisance should be taken of archaeological material that might be present in surface and sub-surface deposits along drainage lines, along hills and sources of water.

6.2.1 Archaeology

Historical Period refuse dumps occur at the BMW, Colville & St Augustine Sites and in terms of their significance, Sampson notes that "any community still in possession of its original ash-heap is most fortunate indeed...[it is] a most precious cultural heritage". He explains that this is so "because an ash-heap is the only really accurate, undistorted and sensitive record of a community's past...archives and documents record the deeds and decisions of such worthies as councillors, mayors and pastors [while] the humble ash-heap reflects an entirely unconscious picture of the real life and times of the community" (1991:9). For this reason, the Historical Period refuse dumps at the BMW, Colville & St Augustine Sites are regarded as of medium heritage significance within a regional context. However, the sites have been degraded and excavated which resulted in the general loss of context and site integrity for the artefacts. The refuse dumps will be reworked and rehabilitated in order to convert these sites into residential and urban developments. As such, impact on the resources by the proposed activities will be direct and permanent. The threshold of the impact can be limited by the implementation of mitigation measures (site sampling, destruction permitting, site monitoring in order to avoid the destruction of previously undetected heritage remains) for the sites, if / when required.

6.2.2 Built Environment

The study has not identified any buildings or structures of heritage significance which will be impacted by the proposed project. This is confirmed by an examination of aerial photographs of the area. No impact on built environment sites is therefore anticipated. For the rest of the project area, the general landscape holds varied significance in terms of the built environment as the area comprises historical mining remnants and relatively newly established settlement areas. However, no impact on built environment sites is anticipated.

6.2.3 Cultural Landscape

The larger area comprises a rich cultural horizon and the natural landscape surrounding the proposed project encompasses the larger historical Kimberley Mine Complex situated in open grasslands and semi-arid plains, typical of the eastern Green Kalahari. The cultural landscape holds Herder sites, Colonial Period farmsteads and particularly Historical Period townscapes and industrial remnants. However, the proposed project is unlikely to result in a significant impact on the cultural landscape of this area.

6.2.4 Graves / Human Burials Sites

No human burials were documented in the project. In the rural areas of the Northern Cape Province, graves and cemeteries often occur around farmsteads in family burial grounds but they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as

a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances, packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

6.3 Management actions

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

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

For the Historical Period middens of medium significance within the project areas the following are required in terms of heritage management and mitigation:

PROJECT COMPONENT/S	All phases of construction and operation.		
POTENTIAL IMPACT	Damage/destruction of sites.		
ACTIVITY RISK/SOURCE	Digging foundations and trenches into sensitive deposits that are not visible at the surface.		
MITIGATION: TARGET/OBJECTIVE	To locate previously undetected heritage remains / graves as soon as possible after disturbance so as to maximize the chances of successful rescue/mitigation work.		
MITIGATION: ACTION/CONTROL		**RESPONSIBILITY**	**TIMEFRAME**
Fixed Mitigation Procedure (**required**)			
Site Monitoring: Regular examination of trenches and excavations in order to detect and preserve previously undocumented heritage receptors. **Site Sampling:** Excavation of a representative sample of the middens to assess significance before any further decision pertaining to heritage mitigation (e.g. Phase 2 Specialist Study) is taken. Subject to excavation permitting if and when required. **Destruction Permitting:** Application for destruction permit if / when required.		ECO, HERITAGE ASSESSMENT PRACTITIONER	Monitor as frequently as practically possible. Prior to the commencement of construction and earth-moving.
PERFORMANCE INDICATOR	Archaeological sites are discovered and mitigated with the minimum amount of unnecessary disturbance.		
MONITORING	Successful location of sites by person/s monitoring.		

7 RECOMMENDATIONS

The heritage landscape around Kimberley contains rich and significant heritage which spans from 1.5 million years to the recent Historical and Industrial Periods. Notable National Heritage sites such as the Historical Kimberley Mine occur in the area. The following recommendations provide an outline for the conservation and management of the heritage landscape in the proposed BMW, Colville & St Augustine Sites Development Area, cognisant of this sensitive landscape:

- According to the South African Heritage Resources Agency Information System (SAHRIS) Palaeo Map, portions of the project area fall within a sensitive fossiliferous zone and a Palaeontological Assessment is recommended for the project, subject to review and recommendations by the relevant heritage authorities. Should fossil remains such as fossil fish, reptiles or petrified wood be exposed during construction, these objects should carefully safeguarded and the relevant heritage resources authority (SAHRA) should be notified immediately so that the appropriate action can be taken by a professional palaeontologist.
- Cognisant of the regional significance of the Historical Dumps at the BMW, Colville & St Augustine Sites, it is suggested that a representative sample of the middens be excavated in order to assess their significance before any further decision pertaining to heritage mitigation (for example potential Phase 2 archaeological specialist assessments) are taken. This measure should be undertaken subject to the relevant archaeological excavation permitting requirements from the competent heritage authority (SAHRA). In addition, destruction permits should be obtained from the relevant heritage authorities (SAHRA) prior to any impact on these sites.
- It is recommended that all planned activities should be carefully monitored by an archaeologist familiar with the archaeology and history of Kimberley on a regular basis (bi-monthly during initial site clearing and ground moving) in order to detect impact on the cemetery or any previously undetected heritage remains at the earliest opportunity. In addition, an informed ECO should inspect the construction sites on regular basis in order to monitor possible impact on heritage resources.
- Considering the localised nature of heritage remains, the general monitoring of the development progress by an ECO or by the heritage specialist is recommended for all stages of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.
- Since the intrinsic heritage and social value of graves and cemeteries are highly significant, these resources require special management measures. Should human remains be discovered at any stage, these should be reported to the Heritage Specialist and relevant authorities (SAHRA) and development activities should be suspended until the site has been inspected by the Specialist. The Specialist will advise on further management actions and possible relocation of human remains in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to human remains. A full social consultation process should occur in conjunction with the mitigation of cemeteries and burials.

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

- As Palaeontological remains occur where bedrock has been exposed, all geological features should be regarded as sensitive.

- Water sources such as drainage lines, fountains and pans would often have attracted human activity in the past. As Stone Age material occur in the larger landscape, such resources should be regarded as potentially sensitive in terms of possible subsurface deposits.

8 GENERAL COMMENTS AND CONDITIONS

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

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

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

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10 ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND

10.1 CRM: Legislation, Conservation and Heritage Management

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

10.1.1 Legislation regarding archaeology and heritage sites

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

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

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

The Act identifies heritage objects as:

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

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

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

and

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

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

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

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

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

and

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

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

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

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

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

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

10.1.2 Background to HIA and AIA Studies

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

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

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

development categorised as:

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

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

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

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

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

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

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

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

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

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

And:

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

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

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

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

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

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

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

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

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

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

10.2 Assessing the Significance of Heritage Resources

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

- Categories of significance

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

- *Aesthetic value:*

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

- *Historic value:*

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

- *Scientific value:*

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

- *Social value:*

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

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

Formally protected sites:

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

Generally protected sites:

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

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

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

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

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

11 ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

11.1 Site Significance Matrix

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

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

11.2 Impact Assessment Criteria

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

Significance of the heritage resource

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

Nature of the impact

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

Extent

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

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

Duration

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

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

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

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

Intensity

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

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

Probability

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

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

Confidence

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

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

Impact Significance

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

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

11.3 Direct Impact Assessment Criteria

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

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

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

HERITAGE CONTEXTS	CATEGORIES OF DEVELOPMENT
Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources **Context 2:** Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources. **Context 3:** Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources	**Category A: Minimal intensity development** - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. **Category B: Low-key intensity development** - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2

Context 4: Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.	- Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). **Category C: Moderate intensity development** - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) **Category D: High intensity development** - Rezoning of a site in excess of 10 000m2 - Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)

11.4 Management and Mitigation Actions

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

No further action / Monitoring

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

Avoidance

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

Mitigation

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

Compensation

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

Rehabilitation

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

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

Enhancement