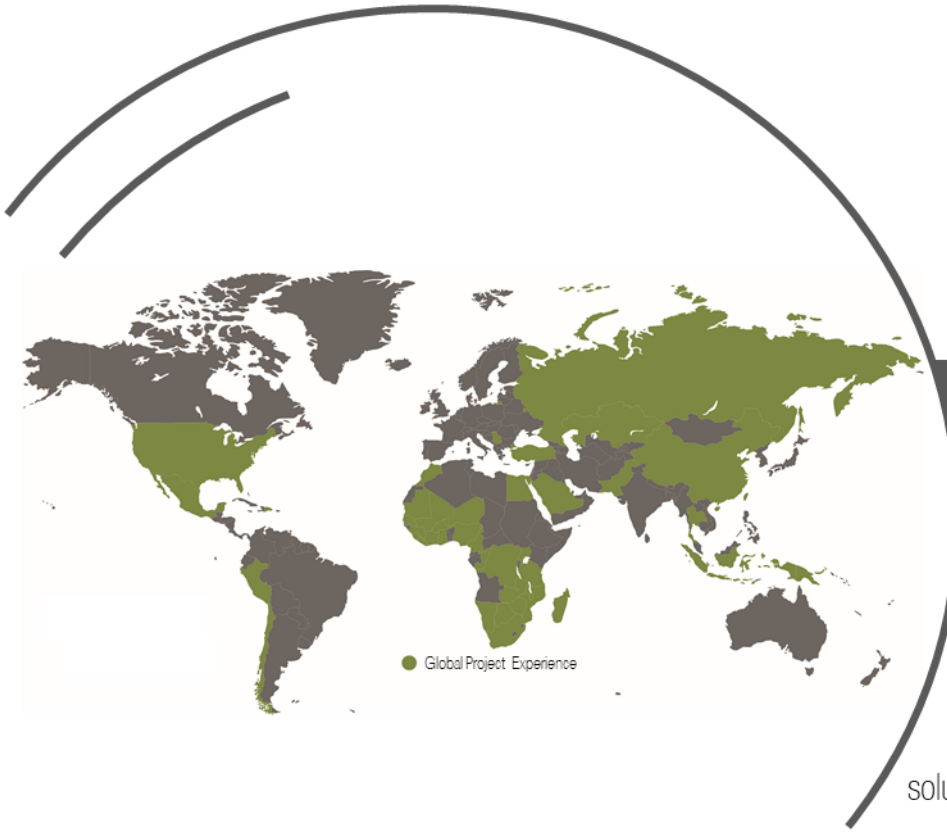

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Proposed Incorporation of Prospecting Rights into the Existing Mining Right for Kalgold Mine in the North West Province

Heritage Basic Assessment Report

Prepared for:
Kalahari Goldridge Mining Company Ltd

Project Number:
HAR6981

May 2021

Digby Wells and Associates
(South Africa) (Pty) Ltd
Company Registration: 2010/008577/07

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This document has been prepared by Digby Wells Environmental.

Report Type:	Heritage Basic Assessment Report
Project Name:	Proposed Incorporation of Prospecting Rights into the Existing Mining Right for Kalgold Mine in the North West Province
Project Code:	HAR6981

Name	Responsibility	Signature	Date
Shannon Hardwick HRM Consultant ASAPA Member: 451	Pre-disturbance Survey Report Compilation		May 2021
Johan Nel Manager: Heritage Services ASAPA Member: 095	Technical Review		

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DETAILS AND DECLARATION OF THE SPECIALIST

Digby Wells and Associates (South Africa) (Pty) Ltd

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Full name:	Shannon Hardwick
Title/ Position:	Heritage Resources Management Consultant
Qualification(s):	Master of Science (MSc) Archaeology
Experience (years):	4 years
Registration(s):	ASAPA, ICOMOS

I, Shannon Hardwick, declare that: –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
  - I declare that there are no circumstances that may compromise my objectivity in performing such work;
  - I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant Acts, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the relevant Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist  *Date:* May 2021

Findings, recommendations and conclusions provided in this report are based on the best available scientific methods and the author's professional knowledge and information at the time of compilation. Digby Wells employees involved in the compilation of this report, however, accept no liability for any actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, and by the use of the information contained in this document.

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EXECUTIVE SUMMARY

The Kalahari Goldridge Mining Company (Pty) Ltd (Kalgold) operates an open-pit gold mine located approximately 55 km southwest of Mafikeng in the North West Province. Kalgold holds a Mining Right (MR) for this gold mine and an additional two Prospecting Rights (PRs) near to the operational mine. Kalgold intends to consolidate the two PRs into the MR and undertake prospecting activities within a portion of one of the PRs (the Project).

To undertake the proposed consolidation and prospecting activities, Kalgold must undertake a Section 102 Amendment Process and receive Environmental Authorisation (EA) in terms of the National Environmental Management Act, 1999 (Act No. 107 of 1998) (NEMA). To this effect, Kalgold appointed Digby Wells Environmental (Digby Wells) to undertake a Basic Assessment (BA) process in compliance with the applicable legislation, with specific reference to the Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice Regulation [GN R] 982 as amended), promulgated in terms of the NEMA.

The BA process includes a Heritage Resources Management (HRM) process to comply with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). This document constitutes the specialist Heritage Basic Assessment Report (HBAR) for submission to the Heritage Resource Authorities (HRAs).

Digby Wells undertook a pre-disturbance survey of the Prosecting Area during which one heritage resource was identified (BGG-001). The Cultural Significance (CS) of this resource is described in the table below. BGG-001 is located within proximity to two of the proposed drilling sites labelled 29 and 30; BGG-001 is located 50 m and 80 m from these points, respectively. The subsequent table summarises the potential impact to this heritage resource arising from activities related to the Project.

Summary of the CS of Identified Heritage Resources

Resource ID	Description	INTEGRITY	CS
BGG-001	Burial ground	4	Very High

Summary of the Impact Assessment

	Duration	Extent	Intensity	Consequence	Probability	Significance
Impact	**Pre-mitigation:**					
Direct impact to BGG	Long Term	International	Extremely high - negative	Extremely detrimental	Low probability	Minor - negative
Impact	**Post-mitigation:**					
Direct impact to BGG	Beyond project life	Very Limited	High - positive	Moderately beneficial	Highly probable	Minor - positive

Additionally, the proposed Project presents a risk of direct negative impact to heritage resources that may exist within the Project area and which have not been identified to date. The table below summarises the risk to these resources.

Summary of the potential risk to heritage resources

Unplanned event	Potential impact
Accidental exposure of fossil bearing material implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA.
Accidental exposure of *in situ* archaeological material during the implementation of the Project.	
Accidental exposure of *in situ* historical built environment sites during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA
Accidental exposure of *in situ* burial grounds or graves during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA.
Accidental exposure of human remains during the construction phase of the Project.	

Considering the nature, location and scope of the Project, Digby Wells recommends Universal Coal implements the following:

- Kalgold must avoid impacts to BGG-001 through an amendment of the location of proposed drill points 29 and 30 or excluding these points from the drilling programme and implement a 100 m no-go buffer zone around the heritage resource to avoid the risk of direct impact to BGG-001;

- Kalgold must develop and implement a Heritage Site Management Plan (HSMP) to conserve BGG-001 *in situ*. Where Kalgold have developed such a management plan for their current operations, this plan must be updated to include BGG-001;
- Where Project design amendments are not feasible, Kalgold will need to embark on a consultation process to assess whether a GRP is feasible; and
- To mitigate against potential direct impacts against previously unidentified heritage resources and where Kalgold has not done so already, Kalgold must develop and implement a Chance Finds Protocol (CFP) prior to the commencement of Project activities. This CFP must be approved by the HRAs prior to implementation.

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

Abbreviation	Meaning
AD	*Anno Domini* (“in the Year of our Lord”)
AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts, or Basic Assessment (*the applicable term will be defined in the report and needs to be understood in the context in which it is used*)
BAR	Basic Assessment Report
BC	Before Christ
BCE	Before Common Era (also: Before Christ or BC)
BGGC	Burial Grounds and Graves Consultation
BID	Background Information Document
BSc	Bachelor of Science
c. or ca.	Circa, meaning approximately
CE	Common Era (also: *Anno Domini* or AD)
CFP	Chance Find Protocol or Procedure
CMP	Conservation Management Plan
CRR	Comments and Response Report
CS	Cultural Significance
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EFC	Early Farming Community (*also known as Early Iron Age, see below*)
EIA	Environmental Impact Assessment. *Please note that EIA can also refer to the ‘Early Iron Age’; however, in this document, this time period is referred to as ‘Early Farming Community’.*
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
ESA	Early Stone Age
FR	Field Rating
GIS	Geographical Information System
GN R	Government Notice Regulation
GPS	Global Positioning System

Abbreviation	Meaning
HBAR	Heritage Basic Assessment Report
HIA	Heritage Impact Assessment
Hons	Honours degree
HRAs	Heritage Resources Authorities
HRM	Heritage Resources Management
HSMP	Heritage Site Management Plan
ICOMOS	International Council on Monuments and Sites
Kya	Thousand years ago
LFC	Late Farming Community also known as Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age (not generally used, referred to as the Farming Community)
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right (boundary)
MRA	Mining Right Application
MSA	Middle Stone Age
MSc	Master of Science
Mya	Million years ago
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NWPHRA	North West Provincial Heritage Resources Authority
PHRA	Provincial Heritage Resources Authority
PR	Prospecting Right
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SCF	Statutory Comment Feedback
SEP	Stakeholder Engagement Process
SoW	Scope of Work
ToR	Terms of Reference

Abbreviation	Meaning
UP	University of Pretoria
Wits	University of the Witwatersrand
Werf	A farmstead or multiple outbuildings associated with a farmhouse or agricultural activities. Plural: *werwe* (Afrikaans).

Refer to Appendix A for a Glossary of Terms.

NHRA and GN R 326 Appendix 6 Legislated Requirements

Description	App. 6	NHRA	Section
Declaration that the report author(s) is (are) independent.	1(b)	-	Page iii-iv
An indication of the scope of, and the purpose for which, the report was prepared.	1(c)	-	0 1.2
Details of the person who prepared the report and their expertise to carry out the specialist study.	1(a)	-	1.3
Outlines the legislative framework relevant to the specialist heritage study.	-	-	0
Identifies the specific constraints and limitations of the HIA, including any assumptions made and any uncertainties or gaps in knowledge.	1(i)	-	4
Describes the methodology employed in the compilation of this HIA.	1(e)	-	5
An indication of the quality and age of base data used for the specialist report.	1(cA)	-	5.4 14
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.	1(d)	-	5.5
Provides the baseline cultural landscape.	-	38(3)(a)	6
Motivates for the defined CS of the identified heritage resources and landscape.	-	38(3)(b)	7.1
A description of the potential impacts to heritage resources by project related activities, including: - Existing impacts on the site; - Possible risks to heritage resources; - Cumulative impacts of the proposed development; - Acceptable levels of change; and - Heritage-related risks to the project.	1(cB)	38(3)(c)	7.2 7.3 7.4
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.	1(j)	38(3)(c)	
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives.	1(f)	-	0 Plan 3
Considers the development context to assess the socio-economic benefits of the project in relation to the presented impacts and risks.	-	38(3)(d)	6.3 12.1

Description	App. 6	NHRA	Section
A description of any consultation process that was undertaken during the course of preparing the specialist report and the results of such consultation.	1(o)	38(3)(e)	10
A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	1(p)	38(3)(e)	
Details the specific recommendations based on the contents of the HIA.	-	38(3)(g)	11
An identification of any areas to be avoided, including buffers.	1(g)		
Any mitigation measures for inclusion in the Environmental Management Programme (EMPr)	1(k)		8
Any conditions for inclusion in the environmental authorisation.	1(l)		11
Any monitoring requirements for inclusion in the EMPr or environmental authorisation.	1(m)		9
A reasoned opinion— (i) whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	1(n)	38(3)(g)	12
Collates the most salient points of the HIA and concludes with the specific outcomes and recommendations of the study.	-	38(3)(f) 38(3)(g)	13
Lists the source material used in the development of the report.	1(cA)	-	14
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	1(h)	-	Plan 3
Any other information requested by the competent authority.	1(q)	-	N/A

1. Introduction

The Kalahari Goldridge Mining Company (Pty) Ltd ("Kalgold"), a subsidiary of Harmony Gold Mining Company Limited ("Harmony"), operates an open-pit gold mine situated on the Kraaipan Greenstone Belt, located approximately 55 km southwest of Mafikeng in the North West Province[1]. Kalgold holds two additional Prospecting Rights[2] (PRs) and intends to consolidate these into the existing Mining Right (MR). Additionally, Kalgold intends to undertake prospecting activities within one of these PR areas (the Project).

Kalgold must undertake a Section 102 Amendment Process and receive Environmental Authorisation (EA) to consolidate the existing PRs into the MR and undertake the additional prospecting activities in terms of the National Environmental Management Act, 1999 (Act No. 107 of 1998) (NEMA). To this effect, Kalgold appointed Digby Wells Environmental (Digby Wells) to undertake a Basic Assessment (BA) process in compliance with:

- The NEMA;
- The Environmental Impact Assessment (EIA) Regulations, 2014 (Government Notice Regulation [GN R] 982 as amended), promulgated in terms of the NEMA; and
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The BA process includes a Heritage Resources Management (HRM) process to comply with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). This document constitutes the specialist Heritage Basic Assessment Report (HBAR) for submission to the Heritage Resource Authorities (HRAs). In this case, the HRAs include the South African Heritage Resources Agency (SAHRA) and the North West Provincial Heritage Resources Authority (NWPHRA)[3].

1.1. Terms of Reference

Kalgold appointed Digby Wells as the independent Environmental Assessment Practitioner (EAP) to undertake the Section 102 Amendment and BA processes in support of the proposed Project. The BA process includes an HRM process in compliance with Section 38(8) of the NHRA.

[1] Mining Right Reference Number NW 30/5/1/2/2/77 MR, issued 09 November 2021.

[2] Reference Numbers: NW 30/5/1/1/2/863 PR and NW 30/5/1/1/2/1469 PR

[3] NWPHRA is deemed competent to comment only on heritage resources afforded general protection in terms of Section 34 of the NHRA (i.e. built heritage resources). In cases where no such heritage resources are identified, Digby Wells will submit the HBAR to NWPHRA for noting only.

1.2. Scope of Work

The Scope of Work (SoW) for the specialist HRM process included the compilation of an HBAR to comply with the requirements encapsulated in Section 38(3) of the NHRA. Digby Wells completed the following activities as part of the SoW:

- Description of the predominant cultural landscape supported through primary and secondary data collection;
- Assessment of the Cultural Significance (CS) of the identified heritage resources;
- Identification of potential impacts to heritage resources based on the Project description and Project activities;
- An evaluation of the potential impacts to heritage resources relative to the sustainable socio-economic benefits that may result from the Project;
- Recommending feasible management measures and/or mitigation strategies to avoid and/or minimise negative impacts and enhance potential benefits resulting from the Project; and
- Submission of the HBAR (and supporting reports) to the HRAs for Statutory Comment as required under Section 38(8) of the NHRA.

1.3. Expertise of the Specialists

Table 1-1 presents a summary of the expertise of the specialists involved in the compilation of this report. Appendix A includes the full CVs of these specialists.

Table 1-1: Expertise of the specialists

Team Member	Bio Sketch
Shannon Hardwick ASAPA Member: 451 ICOMOS Member 38048 Years' Experience: 4	Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern and has most recently been appointed as a Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of various heritage assessments, including Heritage Scoping Reports (HSRs), Heritage Impact Assessments (HIAs), HBARs and Section 34 permit applications. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and various social baselines. Shannon's experience in the field includes pre-disturbance surveys in South Africa, Malawi and the Democratic Republic of the Congo and other fieldwork in Malawi.

Team Member	Bio Sketch
Johan Nel ASAPA Member 095 ICOMOS Member Years' Experience: >20	Johan is a qualified archaeologist, heritage specialist and Manager of the Heritage Services department in Digby Wells. He obtained a BA Honours degree in Archaeology from the University of Pretoria in 2001. He also completed a Professional Development Certificate in Integrated Heritage Resources Management through Rhodes University in 2016. Johan is a professional and accredited member of the Association of Southern African Professional Archaeologists (ASAPA) and a member of the International Council on Monuments and Sites (ICOMOS) South Africa. He has more than 20 years' extensive and diverse experience in heritage resource management. Johan has worked in numerous African settings including South Africa, Botswana, the Democratic Republic of Congo, Liberia and Sierra Leone. His current interests include ways to empower local communities to use, conserve, and manage heritage resources themselves, as well as integrating living and intangible heritage practices with the more traditional heritage approaches to heritage management. Key concepts he is exploring include cultural humility and so-called People-centred Approaches to conservation of both natural and cultural heritage.

2. Project Description

Kalgold operates the open pit gold mine Kalgold Mine on several farms along the National Highway N18 (Mafikeng / Vryburg Road), approximately 55 km southwest of Mafikeng. The mine is located in the Ratlou Local Municipality (RLM) within the Ngaka Modiri Molema District Municipality (NMMDM) of the North West Province.

Kalgold holds two additional PRs within proximity to the Kalgold Mine, which cover an aerial extent of approximately 42 000 ha. These PRs are divided into five blocks, namely:

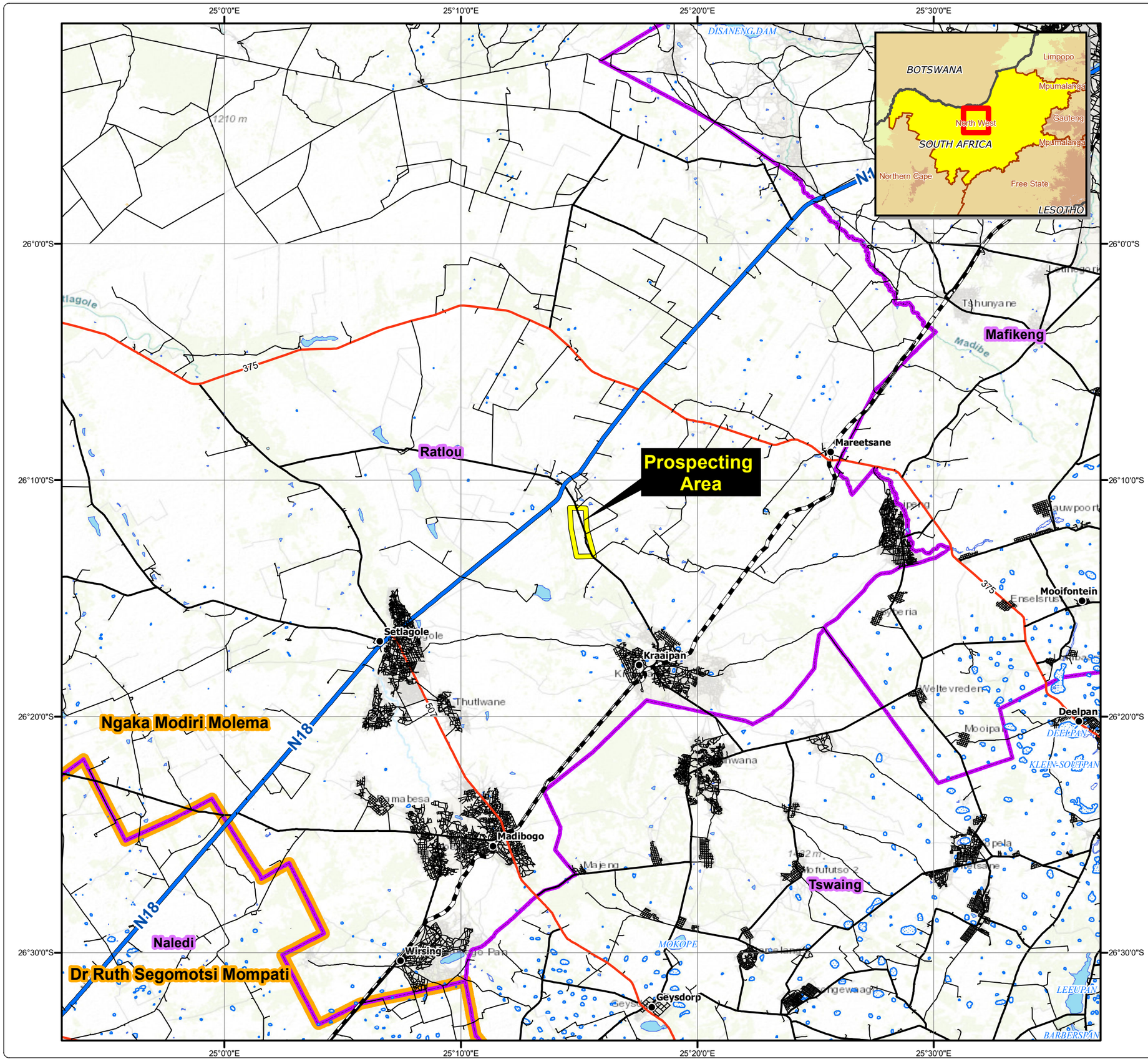
- Goldridge Block;
- Lynplaats Block;
- Madibe Block;
- Northern Farms Block; and
- Vryhof Block.

Kalgold intends to undertake additional prospecting activities. Section 2.1 below.

Plan 1

Kalgold: Mahikeng Prospecting Area

Regional Setting



Legend

- City
- Major Town
- Secondary Town
- Other Town
- Settlement
- National Route
- Main Road
- Secondary Road
- Street
- Railway Line
- Dam/Lake
- Dry pan
- Reservoir/Water tank
- Marsh/Swamp
- Non-perennial pan
- Prospecting Area
- LocalMunicipalities2016
- DistrictMunicipalities2016

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Date: 05/05/2021

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Kilometres

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2.1. Proposed Infrastructure and Activities

Kalgold intends to drill 46 drillholes within a portion of the Goldridge Block (the Prospecting Area). These drillholes include the clearing of small[4] areas of vegetation so that the drill rig can be installed for the drilling or boreholes or cores to establish the presence of the desired minerals. These drillholes are arranged in seven transacts within the Prospecting Area. Existing access roads will be used where possible but, where no access currently exists, Kalgold will develop access roads to the proposed drilling sites.

Table 2-1: Project Phases and Associated Activities

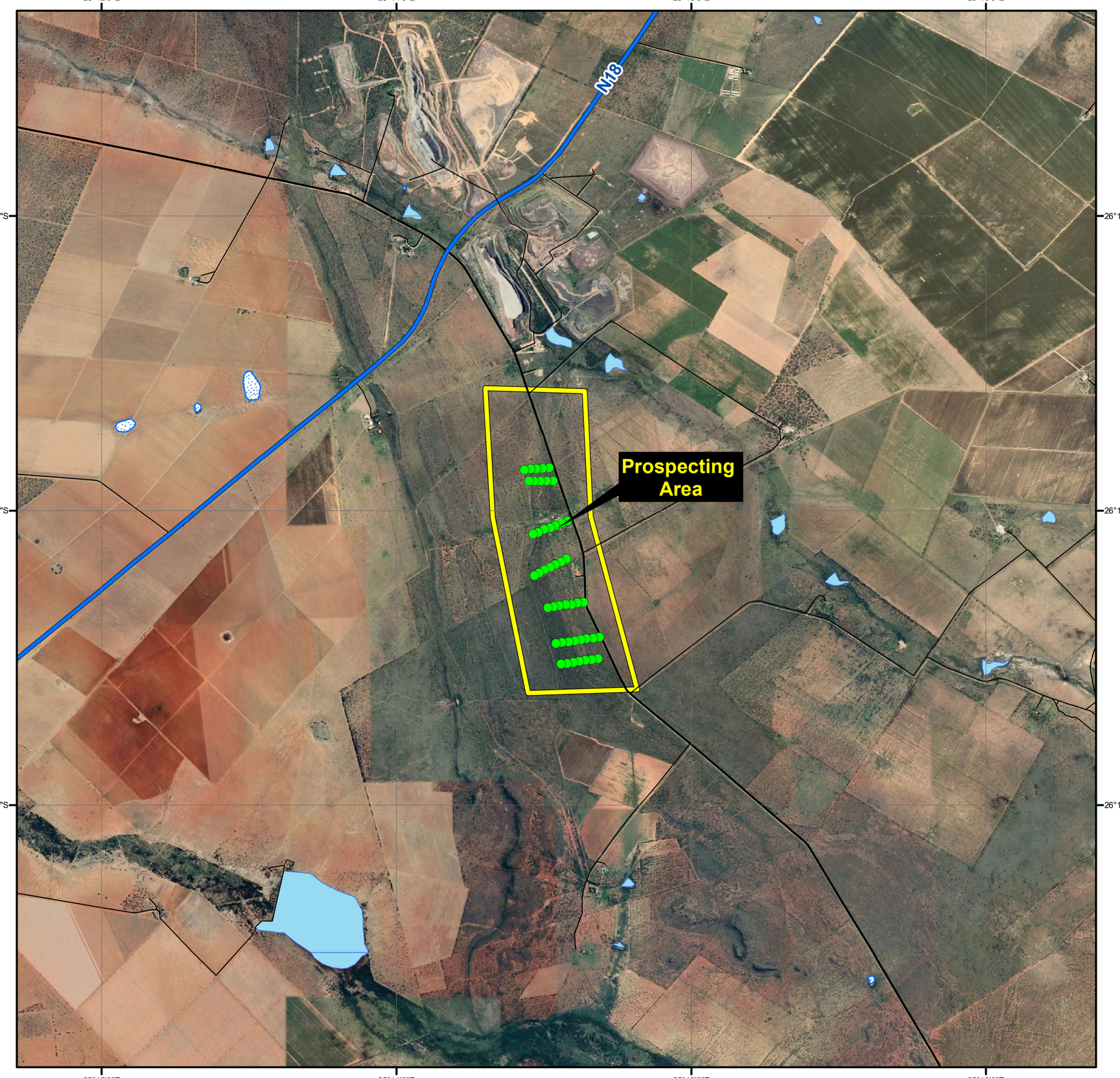
Project Phase	Project Activity
Construction Phase	Clearing of vegetation
	Removal and stockpiling of topsoil
	Construction of temporary access road
	Establishment of temporary contractor's area
Operational Phase	Drilling
	Transporting equipment and materials
	Managing water and effluent required for prospecting activities
	Waste generation
	Managing sewage from the contractor's area
Decommissioning Phase	Rehabilitation Activities (not specified)

[4] Typically an area of 20 m by 20 m, but the BAR does not include the specifics applicable to this Project.

Plan 2

Kalgold: Mahikeng Prospecting Area

Local Setting



Legend

- Prospecting Boreholes
- National Route
- Secondary Road
- Street
- Dam/Lake
- Non-perennial pan
- Prospecting Area

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2.2. Alternatives Considered

The BA process does not consider any Project alternatives. However, the location of the drillhole site or access route to the drillhole sites are subject to change to avoid any sensitivities identified in terms of heritage or biodiversity.

The HRM process considered the 'no-go' alternative. Should the Project not obtain approval, or not go ahead for any reason, potential negative environmental impacts associated with the construction and operation of the proposed additional infrastructure and changes to the approved infrastructure layout will not occur. However, the potential benefits (associated with the Project described in Section 12.1) would also not occur.

3. Relevant Legislation, Standards and Guidelines

This section describes the international, national and regional legislative framework and policy documents that inform the HRM process. The objective is to ensure that the assessments meet all stipulated requirements to ensure legal compliance and successful integration into the regional planning context.

3.1. National Legislation and Policy

Table 3-1 presents a summary of the national legislation applicable to this HRM process and illustrates how it will be considered in the HIA. Table 3-2 below presents the applicable policies considered in the HRM process.

Table 3-1: Applicable Legislation considered in the HRM Process

Applicable legislation used to compile the report	Reference where applied
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that – i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development	The HRM process was undertaken to identify heritage resources and determine heritage impacts associated with the Project. As part of the HRM process, applicable mitigation measures, monitoring plans and/or remediation were recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.

Applicable legislation used to compile the report	Reference where applied
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa, with specific reference to the following Sections: • 5. General principles for HRM • 6. Principles for management of heritage resources • 7. Heritage assessment criteria and grading • 38. Heritage resources management The Act requires that Heritage Resources Authorities (HRAs), be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.	The HBAR was compiled to comply with Section 5, 38(3), (4) and (8) of the NHRA. This report was submitted to the responsible HRAs, which in this instance is SAHRA and NWPHRA.
NHRA Regulations, 2000 (GN R 548) The NHRA Regulations regulate the general provisions and permit application process in respect of heritage resources included in the national estate. Applications must be made in accordance with these regulations. The following Chapters are applicable to this assessment: • II. Permit Applications and General Provisions for Permits; • III: Application for Permit: National Heritage Site, Provincial Heritage Site, Provisionally Protected Place or Structure older than 60 years; • IV: Application for Permit: Archaeological or Palaeontological or Meteorite; • IX: Application for Permit: Burial Grounds and Graves; • X: Procedure for Consultation regarding Protected Area; • XI: Procedure for Consultation regarding Burial Grounds and Graves; and XII: Discovery of Previously Unknown Graves.	The HRM process was undertaken with cognisance of the applicable regulations. The proposed mitigation strategies and management measures must comply with these requirements.

Applicable legislation used to compile the report	Reference where applied
National Environmental Management Act, 1998 (Act No. 107 of 1998) The NEMA, as amended, was set in place in accordance with Section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making on issues affecting the environment. Section 24 (1)(a), (b) and (c) of NEMA state that: *The potential impact on the environment, socio-economic conditions and cultural heritage of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.* The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended.	The application process was undertaken in accordance with the principles of Section 24 of NEMA as well as with the EIA Regulations 2014 (as amended), promulgated in terms of NEMA.
GN R. 982: Environmental Impact Assessment Regulations, 2014 (as amended by GN R 326 of 7 April 2017) These three listing notices set out a list of identified activities which may not commence without an Environmental Authorisation from the relevant Competent Authority through one of the following processes: • Regulation GN R. 983 (as amended by GN R 327) - Listing Notice 1: This listing notice provides a list of various activities which require environmental authorisation and which must follow a basic assessment process. • Regulation GN R. 984 (as amended by GN R 325) – Listing Notice 2: This listing notice provides a list of various activities which require environmental	Refer to the BAR for a full description of the Listed Activities triggered by the proposed Project. To comply with the regulations, an EIA process must be completed in support of the EA application. This HBAR was completed to inform the EIA process to comply with Section 24 of the NEMA.

Applicable legislation used to compile the report	Reference where applied
authorisation and which must follow an environmental impact assessment process. • Regulation GN R. 985 (as amended by GN R 324) – Listing Notice 3: This notice provides a list of various environmental activities which have been identified by provincial governmental bodies which if undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed.	

Table 3-2: Applicable policies considered in the HRM process

Applicable policies used to compile the report	Reference where applied
SAHRA Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007) The guidelines provide the minimum standards that must be adhered to for the compilation of a HIA (2007). Chapter II Section 7 outlines the minimum requirements for inclusion in the heritage assessment as follows: • Background information on the Project; • Background information on the cultural baseline; • Description of the properties or affected environs; • Description of identified sites or resources; • Recommended field rating of the identified sites to comply with Section 38 of the NHRA; • A statement of Cultural Significance in terms of Section 3(3) of the NHRA; and • Recommendations for mitigation or management of identified heritage resources.	This HBAR was compiled to adhere to the minimum standards as defined by Chapter II of the SAHRA Minimum Standards (2007).

3.2. Regional Regulatory Context

The HRM process was completed to comply with the requirements of the South African national legislative framework as described above. Provincial legislation and municipal by-

laws are applicable to graves and cemeteries and are considered in our recommendations where a Grave Relocation Process (GRP) may be required.

4. Assumptions, Limitations and Exclusions

Table 4-1 provides an overview of constraints and limitations encountered during the HRM process.

Table 4-1: Constraints and Limitations

Description	Consequence
Whilst every attempt was made to obtain the latest available information, the reviewed literature does not represent an exhaustive list of information sources for the various study areas.	The cultural heritage baseline presented in Section 0 below is considered accurate but may not include new data or information which may not have been made available to the public.
The pre-disturbance survey focused on the proposed Prospecting Area and exclude any other portions of the areas covered by the current MR or PRs.	Unidentified heritage resources may exist within these areas. Such heritage resources are excluded from this assessment. Heritage resources have been identified within the current Kalgold operational area. The condition and location of these heritage resources was not verified during the pre-disturbance survey.
Every attempt was made to survey the extent of the site-specific study area[5], considering the points above. This report however does not present an exhaustive list of identified heritage resources. Overgrown vegetation limited visibility at the time of the pre-disturbance survey[6].	Unidentified heritage resources may be encountered. Should this occur, Kalgold must alert the HRAs of the find and may need to enlist the services of a suitably qualified archaeologist to advise them on the way forward.
Archaeological and palaeontological resources commonly occur at subsurface levels. These types of resources cannot be adequately recorded or documented by heritage practitioners without destructive and intrusive methodologies that require permits issued in terms of Section 35 of the NHRA.	The reviewed literature and the results of the field survey are in themselves limited to surface observations. Project activities can expose subsurface tangible heritage. Kalgold must alert the HRAs of any chance finds and may need to enlist the services of a suitably qualified archaeologist or palaeontologist to advise them on the way forward.

[5] Refer to Section 5.1 for a description of the study area.

[6] Refer to Section 6.2.1 for a description of the existing environment.

5. Methodology

The following section presents summarised methodologies employed in the HRM process. Appendix C includes a more detailed description of the HRM process methodologies.

5.1. Defining the Study Area

Heritage resources do not exist in isolation to the greater natural and social environment, including the socio-cultural, socio-economic and socio-political environments. In addition, the NHRA requires the grading of heritage resources in terms of national, provincial and local concern based on their importance and consequent official (i.e., State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Three nested study areas were defined for the purposes of this study, and include:

- The *site-specific study area*: the extent of the farm portions associated with the Prospecting Area. The site-specific study area may extend linearly (as in the case of the transects associated with the proposed drill sites), in which case the site-specific study area will include the linear development and a 200 m buffer on either side of the footprint;
- The *local study area*: the area most likely to be influenced by any changes to heritage resources in the Project area or where Project development could cause heritage impacts. Defined as the area bounded by the local municipality, in this instance the RLM, with particular reference to the immediate surrounding properties and/or farms. The local study area was specifically examined to offer a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provided the local development and planning context that may contribute to cumulative impacts; and
- The *regional study area*: the area bounded by the district municipality, which here is the NMMDM. Where necessary, the regional study area may be extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events. The regional study area also provided the regional development and planning context that may contribute to cumulative impacts.

5.2. Statement of Cultural Significance

Digby Wells designed the significance rating process to provide a numerical rating of the CS of identified heritage resources. This process considers heritage resources assessment criteria set out in subsection 3(3) of the NHRA, which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representativity or uniqueness (i.e. known examples of similar resources to exist).

The rationale behind the heritage value matrix takes into account that a heritage resource's value is a direct indication of its sensitivity to change (i.e. impacts). Value, therefore, was determined prior to completing any assessment of impacts.

The matrix rated the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social. Resource significance is directly related to the impact on it that could result from Project activities, as it provided minimum accepted levels of change to the resource.

5.3. Definition of Heritage Impacts

Potential impacts to heritage resources may manifest differently across geographical areas or diverse communities when one considers the simultaneous effect to the tangible resource and social repercussions associated with the intangible aspects. Furthermore, potential impacts may concurrently influence the CS of heritage resources. This assessment therefore considers three broad categories adapted from Winter & Baumann (2005, p. 36). These are described in Table 5-1.

Table 5-1: Impact definition

Category	Description
Direct Impact	Affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense but can often be erroneously assessed as high-ranking.
Indirect Impact	Occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any direct impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
Cumulative Impact	Result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be: • Additive: the simple sum of all the effects, e.g. the reclamation of a historical Tailings Storage Facility (TSF) will minimise the sense of the historic mining landscape. • Synergistic: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the removal of all historical TSFs will sterilise the historic mining landscape. • Time crowding: frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building could be high.

Category	Description
	• Neutralizing: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes from a historic to modern mining landscape could reduce the overall impact on the sense-of-place of the study area. • Space crowding: high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

5.4. Secondary Data Collection

Data collection assists in the development of a cultural heritage baseline profile of the study area under consideration. Secondary data was collected to inform this report and was obtained through secondary information sources, i.e., desktop literature review and historical layering.

Diverse repositories were consulted to identify appropriate relevant information sources. These sources were analysed for credibility, relevance and critically reviewed. The literature review objectives included:

- Gaining an understanding of the cultural landscape within which the proposed Project is located; and
- Identify any potential fatal flaws, sensitive areas, current social complexities and issues and known or possible tangible heritage.

Consulted repositories included the South African Heritage Resources Information System (SAHRIS), online / electronic journals and platforms and select internet sources. Table 5-2 presents a summary of these sources (refer to Section 14 for a detailed list of the references). This report includes a summary and discussion of the most relevant findings.

Table 5-2: Secondary Data Sources

Reviewed Secondary Data		
Databases		
Genealogical Society of South Africa (GSSA) database (2011)	SAHRIS Palaeosensitivity Map (PSM) (2017)	
Statistics South Africa (2011)	Wazimap (2017)	
SAHRIS Cases		
Map ID: 7990 Case ID: 1735	Case ID: 5100 Case ID: 74103	Case ID: 6026 Case ID: 10244

Reviewed Secondary Data		
Cited Text		
Behrens & Swanepoel, 2008	Clark, 1982	Deacon & Deacon, 1999
Esterhuysen & Smith, 2007	Huffman, 2007	Huffman & Schoeman, 2002
Mitchell, 2002	NMMDM, 2020	RLM, 2020
Swanepoel, et al., 2008	Tourism North West, 2020	Winter & Baumann, 2005

Historical layering refers to the chronological layering of historic cartographic sources using Geographic Information Systems (GIS). The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence or absence of visible features; and
- Identified potential locations where heritage resources may exist within an area.

Table 5-3 below lists the sources of historical imagery.

Table 5-3: Aerial imagery considered

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Ref.**
568	008	699 700	2526 2625 2626	Lichtenburg	1966	National Geographical Institute (NGI)

5.5. Primary Data Collection

Shannon Hardwick, a qualified archaeologist, undertook a pre-disturbance survey of the site-specific study area on 20 and 21 April 2021. This survey focused on areas covered by proposed drill sites and the transects in between these sites.

The pre-disturbance survey was on foot and non-intrusive (i.e., no sampling was undertaken) with the aim to:

- Visually record the current state of the cultural landscape; and
- Record a representative sample of the visible, tangible heritage resources present within the development footprint area, site-specific study area and greater study area.

Identified heritage resources were recorded as waypoints using a handheld GPS device. The heritage resources were also recorded through written and photographic records.

5.6. Site Naming Convention

Heritage resources identified by Digby Wells during the field survey are prefixed by the SAHRIS case number generated for this Project. Information on the relevant period or feature code and site number follows (e.g., 566/BGG-001). The site name may be shortened on plans or figures to the period/feature code and site number (e.g., BGG-001). Table 5-4 presents a list of the relevant period and feature codes.

Table 5-4: Feature and period codes relevant to this Report

Feature or Period Code	Reference
BGG	Burial Grounds and Graves
HST	Historical Structure
HLP	Historical Layering Point

Heritage resources identified through secondary data collection were prefixed by the relevant SAHRIS case or map identification number (*where applicable*) and the original site name as used by the author of that assessment (e.g., PLA1677/S.35-006).

6. Findings and Discussion

The cultural heritage baseline is presented in this section informed through primary and secondary data collection. This section also includes a summary of the developmental context of the Project and presents potential socio-economic benefits anticipated to arise from the Project (refer to Section 12.1). The latter addresses the NHRA Section 38(3)(d) requirement to assess heritage impacts relative to socio-economic benefits.

6.1. Cultural Heritage Baseline Description

The cultural heritage baseline description considered the predominant cultural landscape based on the identified heritage resources within the regional and local study area. Table 6-1 presents the broad timeframes for the major periods of the past in South Africa.

Table 6-1: Archaeological Periods in South Africa

The Stone Age	Early Stone Age (ESA)	2 million years ago (mya) to 250 thousand years ago (kya)
	Middle Stone Age (MSA)	250 kya to 20 kya

	Later Stone Age (LSA)	20 kya to 500 CE (Common Era[7])
Farming Communities	Early Farming communities (EFC)	500 to 1400 CE
	Late Farming Communities (LFC)	1100 to 1800 CE
Historical Period	-	1500 CE to 1994 (Behrens & Swanepoel, 2008)

Adapted from Esterhuysen & Smith, (2007)

In total, 24 heritage resources were identified in the literature applicable to the regional, local and site-specific study areas. Figure 6-1 presents the breakdown of the identified heritage resources in terms of the archaeological periods.

The predominant tangible heritage resources recorded in the area under consideration are dominated by burial grounds and graves. No expressions of the archaeological periods were noted in the literature relevant to the greater study area. This notwithstanding, archaeological and historical resources were identified within the broader study area.

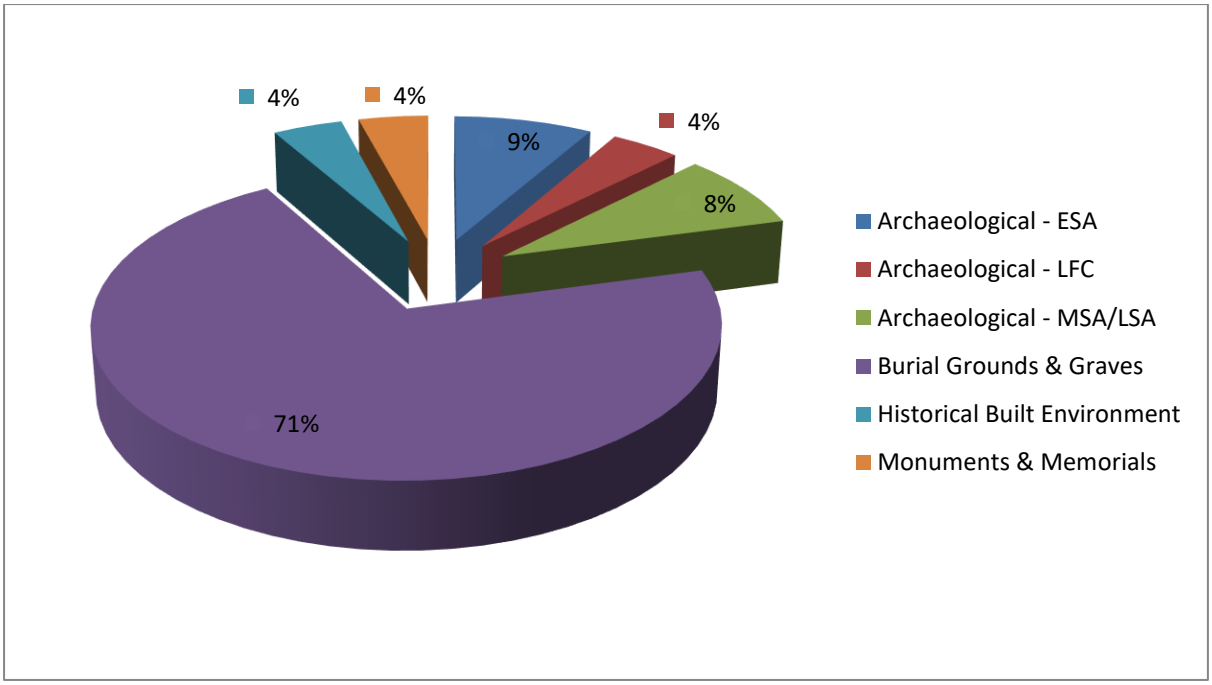

Figure 6-1: Heritage Resources Identified within the Regional Study Area

This section defines the cultural landscape through providing a brief description that offers the reader contextual information, as well as assists the identification of potential risks and impacts to the heritage resources.

[7] Common Era (CE) refers to the same period as *Anno Domini* ("In the year of our Lord", referred to as AD): i.e., the time after the accepted year of the birth of Jesus Christ and which forms the basis of the Julian and Gregorian calendars. Years before this time are referred to as 'Before Christ' (BC) or, here, BCE (Before Common Era).

The Stone Age in southern Africa comprises three broad periods, namely the ESA, MSA and LSA. These periods are characterised by the lithic tools and material culture produced by the various hominid species through time.

The ESA occurred between 2 mya and 250 kya. Lithics from this period comprise predominantly of large handaxes and cleavers made of coarse-grained materials (Esterhuysen & Smith, 2007). These tools are associated with *Australopithecus* and early *Homo* hominid species.

The MSA dates between approximately 300 kya and 20 kya. High proportions of minimally-modified blades, created using the Levallois technique, the use of good quality raw material and the use of bone tools, ochre and pendants characterise the early MSA stone tool industries (Clark, 1982; Deacon & Deacon, 1999). These tools were made and used by archaic *Homo sapiens.*

The LSA dates from approximately 40 kya to the historical period. LSA lithics are specialised as specific tools each have specific uses (Mitchell, 2002). Assemblages from this period commonly include diagnostic tools such as scrapers and segments and may include bone points as well.

Within the regional study area, the Stone is represented by a low and medium density scatter of ESA artefacts and isolated surface artefacts representing the MSA and LSA (Fourie, 2013).

The farming community period correlates to the movements of Bantu-speaking agro-pastoralists moving into southern Africa. Heritage resources associated with this period, specifically the LFC, were recorded in the regional study area.

Archaeological material cultural remains serve as tangible markers of previous occupation. The most visible indicators include ceramics and stonewalling. Stonewalling is the most visible and easily identifiable indicator of occupation. Several variations based on construction technique, coursing, height, shape and internal divisions are known to occur within southern Africa (Huffman, 2007).

Molokwane type settlements are most commonly identified in the literature applicable to the area under consideration. These types of settlements are characterised by:

- Multiple arcs in the outer wall delineating the back courtyards of individual households surrounding a core;
- Small livestock kraals between cattle enclosures and front courtyards; and
- Daga houses in the centre establishing bilobial arrangement of households.

Table 6-2: Stonewalling types within the regional study area

Central Cattle Pattern			
Moor Park Cluster		**Ntsuanatsatsi Cluster**	
Moor Park	14th to 16th century	Type N	15th to 17th century
Melora	16th century onwards	Badfontein / Bokoni	16th century
Kwamaza	18th century to historic period.	Doornspruit	19th century
		Klipriviersberg	19th century
		Type V	19th century
		Molokwane	
		Type Z	19th century
		Type B	19th century
		Tukela	19th century

After Huffman (2007)

Ceramics were an active part of cultural group dynamics, providing a social function through conveying symbols and metaphors. Because of this, archaeologists can use ceramics to show a relative cultural-historical temporal sequence to recognise ceramic users in the archaeological record (Huffman, 2007). Ceramic classification is universally used by archaeologists to establish relative cultural-historical temporal sequences within southern African Farming Communities. In this way, relative dates can be assigned to sites, as well as inferring tenuous cultural similarities or associations.

Table 6-3: Ceramic facies within the local study area

Facies	Period	Characteristics
Ntsuanatsatsi	1450 - 1650 CE	Broad stamping in the neck and stamped arcades on the shoulder. Appliqué.
Uitkomst	1650 – 1820 CE	Stamped arcades, appliqué and blocks of parallel incisions. Also includes stamping and chord impressions.
Rooiberg	1650 – 1750 CE	Stamped rim band and a mixture of stamped and incised bands with arcades and triangle in the neck.

After Huffman (2007)

Within the regional study area, one record of the LFC was identified. This includes stonewalls on a ridge running parallel to the nearby road (van Schalkwyk, 2004).

The historical period[8] is commonly regarded as the period characterised by contact between Europeans and Bantu-speaking African groups and the written records associated with this

[8] In southern Africa, the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern

interaction. However, the division between the LFC and historical period is artificial, as there is a large amount of overlap between the two.

The town of Kroondal is approximately 10 km away from the town of Rustenburg. Kroondal was established in 1843 on the farm Kronendal (which is now also known as Kroondal) (Tourism North West, 2020). The farm was registered in 1858 in the name Jan Michiel van Helsdingen. A German Lutheran mission was established on the farm. When the mission society could not afford to pay maintenance for anyone but the missionaries, workers left the mission station and settled nearby as independent farmers. The town was surveyed in 1889 and the school was established in 1892.

Rustenburg was originally settled in the 1840s by burghers led by Andries Pretorius (Tourism North West, 2020). The town was founded in 1851 and is the third oldest town within the former Transvaal Province.

The historical period within the regional study area is represented by:

- Structural remains, including stone foundations (Fourie, 2013);
- A memorial from 1964 (van Schalkwyk, 2004); and
- Burial grounds and graves, which range in size from single graves to graveyards of twenty graves or less (van Schalkwyk, 2004; Fourie, 2013; Seliane, 2013; Pistorius, 2014; van der Walt, 2014; van der Walt, 2018). Some of these graves have been relocated from their original position (Fourie, 2013).

6.2. Results from Pre-disturbance Survey

Shannon Hardwick undertook a pre-disturbance survey of the site-specific study area on 20 and 21 April 2021. This survey focused on areas covered by proposed drill sites and the transects in between these sites. This area was surveyed on foot.

The survey was recorded as GPS tracks and identified heritage resources were marked as waypoints. The GPS data are provided in Plan 3. Identified heritage resources were also recorded through written notes and photographs. The following sections describe the observations made during the survey and the outcomes of the survey.

6.2.1. Existing Environment

The prospecting site is a greenfields site; i.e., no developments have taken place on the property. The site is, however, disturbed through anthropogenic and animal activity. Animal activity includes grazing by cattle and donkeys and the establishment of burrows by various burrowing animals. Where observed, animal burrows were inspected for potential archaeological or historical material.

identities outside of European contact. This period is currently not well documented but is being explored through the 500 year initiative (Swanepoel, et al., 2008).

Anthropogenic disturbances included agricultural activities and the establishment of associated infrastructure including residential homes, farm outbuildings, formal and informal roads and animal feeding troughs or bins.

Figure 6-2 below presents an overview of the environment at the time of the pre-disturbance survey.

Figure 6-2: Results of the Pre-disturbance Survey showing the Existing Environment

6.2.2. Newly-Identified Heritage Resources

One heritage resource was identified during the pre-disturbance survey Table 6-4 includes a description of this heritage resource and Figure 6-3 includes photographs.

Table 6-4: Heritage Resources identified within the Prospecting Area

Heritage Resource	Description
BGG-001	A well maintained burial ground demarcated by a half-height cement wall with an iron gate, comprising at least ten graves, including a double grave. Flowers and other grave goods are placed on some graves. All graves have granite headstones with legible inscriptions in English or Afrikaans. All but the double grave have granite curbs, and one also includes a slab of granite. Surnames identify the as Fielding, Meyer and Mouton families. The graves range in date from 1953 to 2008. The headstones include a mix of English and Afrikaans inscriptions.

Figure 6-3: Results of the Pre-disturbance Survey showing Newly Identified Heritage Resource

Plan 3

Kalgold: Mahikeng Prospecting Area

Pre-disturbance Survey

25°14'0"E 25°14'30"E 25°15'0"E 25°15'30"E 25°16'0"E

26°11'0"S 26°11'30"S 26°12'0"S 26°12'30"S 26°13'0"S 26°13'30"S

N18

BGG001

Legend

Pre-disturbance Survey

- BGG001
- Prospecting Boreholes
- Survey Tracks
- National Route
- Secondary Road
- Street
- Dam/Lake
- Prospecting Area

DIGBY WELLS ENVIRONMENTAL

• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator	Ref #: HAR6891_Plan3
Datum: WGS 1984	Revision Number: 1
Central Meridian: 25°E	Date: 05/05/2021

N

0 0.25 0.5 1

Kilometres

1:20000

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6.2.3. Results from Historical Layering

Figure 6-4 presents the Project area as in 1966. The Project area is characterised by agricultural fields and areas of natural vegetation cover. The Project area appears to have a long history of disturbance through agricultural activity.

The farm werf (known to Kalgold employees as Norman's Farmhouse) within the Project area does not appear on the historical imagery. It is therefore unlikely to be older than 60 years and is not afforded general protection under Section 34 of the NHRA. No other structures or points of interest were identified in this imagery.

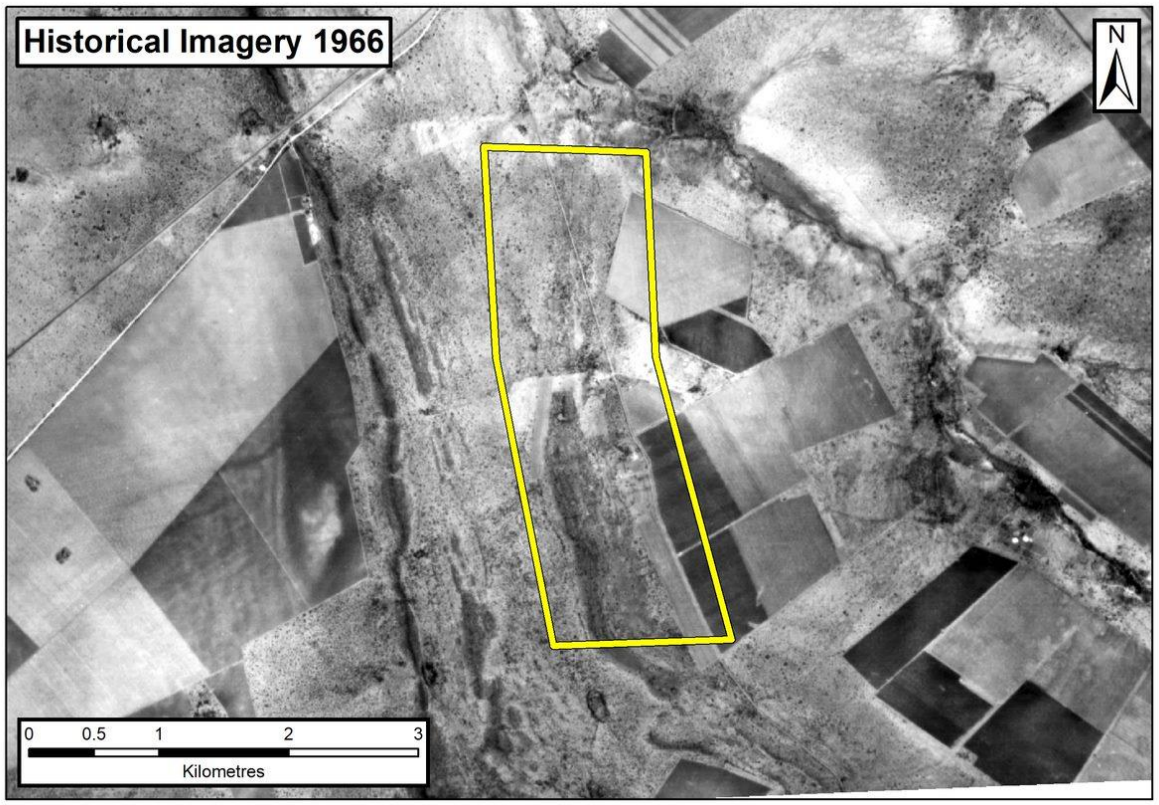

Figure 6-4: Project Area in 1966 Historical Imagery

6.3. Development Context and Anticipated Socio-economic Benefits

The Project is located within Ward 11 the RLM of the NMMDM in the North West Province. This section presents a brief summary of the demographic statistics relevant to the potential socio-economic benefit derived from the Project, informed by data collected during the 2016 Community Survey (Statistics South Africa, 2011). Wazimap (2017) has adjusted these data to conform with the updated ward and municipality boundaries which were altered ahead of the 2016 Municipal Elections (Open Up, 2017). These data are supplemented by information included in the Integrated Development Plan (IDP) for the RLM (2020) and NDDM (2020).

As of the 2011 Census, the North West Province had a population of 3 509 953, which accounts for approximately 6.8% of the national population (Wazimap, 2017). The province includes four district municipalities, of which the NMMDM is the second largest in terms of population. The district included 842 699 residents (24% of the population of the province). NMMDM is itself divided into five local municipalities. RLM is the smallest of the local municipalities in terms of population, which included 107 338 people in 2011 (12.7% of the population in the NMMDM). By 2016, this population had increased to 110 000 people (RLM, 2020).

The RLM includes 14 wards. Ward 11 includes a population of 7 155 people (Wazimap, 2017). The ward is predominantly rural, but does include three four settled areas, including Mareetsane and parts of Old Kraaipan, and 26 villages (Wazimap, 2017; RLM, 2020). The area is characterised by agriculture, including cultivation of crops and animal grazing, and mining (predominantly Kalgold operations).

Unemployment is a challenge within the regional study area. Table 6-5 presents an overview of the employment status of the populations within the regional study area.

Table 6-5: Employment Status of the Populations within the Study Area

Employment Statistics (Census 2011)	Ward 11		RLM		NMMDM	
	No.	%	No.	%	No.	%
Total Population	7 155	-	107 338	-	842 699	-
Working Age (18-64)	3 958	55.3	50 281	46.8	459 414	54.5
Employed	1 777	24.8	8 812	8.2	149 334	17.7
Discouraged Work Seeker	256	3.6	6 587	6.1	41 366	4.9
Unemployed	370	5.2	6 885	6.4	75 973	9
Other not economically active	1 904	26.6	35 542	33.1	245 495	29.1

Adapted from Wazimap (2017)

Referencing the upper poverty line, 79 400 people were considered impoverished in 2016, accounting for approximately 72.6% of the population. This number reflects a 9.43% decrease of since 2006.

Within the NMMDM, approximately 26% of the population was employed or actively seeking employment in 2017 (NMMDM, 2020). Using the 2018 economically-active population , 58 200 people were unemployed that amounted to 19.8%, indicating an overall decrease from 2008, during which the unemployment rate was 24.2% .

Agriculture is the major economic driver within the NMMDM (2020); tourism being a secondary major economic driver within the RLM. The economic sectors employing the largest portions of the working population respectively include Community Services, Finance and Trade

sectors. Community Services and Trade employ 30.3% and 21.7% of the population[9]. Mining employs relatively small portion of the workforce (1.7%).

7. Impact Assessment

This section presents a description of the Cultural Significance (CS) of the identified heritage resource informed through primary and secondary data collection. The CS of the heritage resource informs the minimum required mitigation encapsulated in the NHRA and the SAHRA Minimum Standards. Sections 7.2 to 7.4 below describe the impacts to the identified heritage resource.

7.1. Cultural Significance of Identified Landscape

Heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures and are finite, non-renewable and irreplaceable. Considering the innate value of heritage resources, HRM acknowledges that these have lasting worth as evidence of the origins of life, humanity and society. Notwithstanding the inherent value ascribed to heritage, it is incumbent on the assessor to determine the significance of these resources to allow for the implementation of appropriate management. This is achieved through assessing the value of heritage resources relative to the prescribed criteria encapsulated in policies and legal frameworks.

This section presents a statement of CS relevant to identified heritage resources and the greater cultural landscape of the site-specific study area. The statement of significance considers the importance or the contribution of the identified heritage resources and the landscape to four broad value categories: aesthetic, historical, scientific and social, to summarise the CS and other values described in Section 3(3) of the NHRA.

The pre-disturbance survey recorded a single heritage resource was recorded – one burial ground. The burial ground exhibited very high CS, based on the evaluated criteria presented in Table 7-1.

[9] The percentage of the population employed by the Finance sector was not included in this report (NMMDM, 2020).

Table 7-1: CS and Field Ratings of Newly Identified Heritage Resources within the Project Area

Resource ID	Description	Aesthetic	Historic	Scientific	Social	INTEGRITY	Designation	Recommended Field Rating	Field Rating Description	Minimum Mitigation[10]
BGG-001	Burial Ground	- The burial groundwas not assessed against aesthetic criteria as defined in Section 3(3) of the NHRA.	- The burial groundwas not assessed against historic criteria as defined in Section 3(3) of the NHRA.	- The burial ground was not assessed against scientific criteria as defined in Section 3(3) of the NHRA.	5 The burial ground and graves have specific connections to communities or groups for spiritual reasons. This significance is universally accepted.	4 The integrity of this burial groundis considered to be excellent with both tangible and intangible fabric preserved.	Very High 20	Grade I[11]	Heritage resources with qualities so exceptional that they are of special national significance.	Project design must change to avoid the resource completely and resources must be included in Heritage Site Management Plan (HSMP). A Grave Relocation Process (GRP) may be necessary should the project design not be changed.

[10] Please note: this recommended mitigation refers to the SAHRA minimum mitigation requirements. Project-specific mitigation measures are presented in Section 0

[11] The recommended field rating designates the level of governance associated with the resource. In this instance, the SAHRA Burial Grounds and Graves Unit is the designated competent authority responsible for the management of heritage resources contemplated in terms of Section 36 of the NHRA.

7.2. Heritage Impact Assessment

This report considered potential, predicted impacts that may result from activities associated with the establishment and operation of the proposed prospecting drilling sites at each stage of the Project lifecycle.

7.2.1. Construction Phase

Table 7-2 presents the activities expected to occur during the Construction Phase and the expected impacts on the cultural heritage landscape that may arise from these activities.

Table 7-2: Interactions and Impacts of Construction Phase Activities

Interaction	Impact
Clearing of vegetation	Direct negative impacts to BGG-001
Removal and stockpiling of topsoil	
Construction of temporary access road	
Establishment of temporary contractor's area	

BGG-001 is located within 50 m of the proposed drilling site 29 and within 80 m of proposed drilling site 30. As such, there is potential for BGG-001 to be directly impacted through the clearing of land for the establishment of both these drill sites. Table 7-3 presents a summary of the potential direct impact to this heritage resource.

Table 7-3: Summary of the potential direct impact to Burial Grounds and Graves

IMPACT DESCRIPTION: Direct impact to Heritage Resource BGG-001				
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Long Term (4)	Damage to the heritage resource may last longer than half of the proposed Project lifecycle. Damage will need to be rectified by Kalgold in consultation with the NoK.	Consequence: Extremely detrimental (-18)	Significance: Minor – negative (-54)

IMPACT DESCRIPTION: Direct impact to Heritage Resource BGG-001			
Dimension	**Rating**	**Motivation**	
Extent	International (7)	Damage to these resources could potentially have an international effect in terms of Kalgold's reputation (which could have a knock-on effect in terms of investment) and NoK could potentially reside outside South Africa.	
Intensity x type of impact	Extremely high - negative (-7)	Damage would constitute a major change to resource of Very High CS.	
Probability	Low probability (3)	Without the implementation of mitigation or management measures and considering the location of the heritage resource relative to the infrastructure, it is possible that this resource will be damaged.	
MITIGATION:			
The project related mitigation must aim to amend the project design to avoid the potential negative impact to the heritage resource and implement a 100 m no-go buffer zone[12]. around the heritage resource Where it is determined that the negative impact may not manifest, the heritage resource must be incorporated into an HSMP for implementation. Should Kalgold have an existing HSMP for their adjacent operation, BGG-001 must be incorporated into the existing HSMP and be subject to the same requirements encapsulated therein. Where Project redesign and *in situ* conservation is not feasible based on the current mining operations and location of the mineral resources, heritage related mitigations must be employed. Heritage related mitigations will need to be undertaken in accordance with the requirements of the NHRA and NHRA Regulation, 2000 (GN R 548) will be required. Such mitigations may include a Burial Grounds and Graves Consultation (BGGC) to assess whether a GRP (which must be undertaken in accordance with Section 36 of the NHRA and Chapter IX and XI of the NHRA Regulations) is feasible. Digby Wells assumes that Project design is the preferred alternative, and the post-mitigation impact assessment considers this mitigation strategy.			

[12] It is Digby Wells' experience that SAHRA Policy requires a buffer zone of at least this size around burial grounds and graves.

IMPACT DESCRIPTION: Direct impact to Heritage Resource BGG-001				
Dimension	**Rating**	**Motivation**		
POST-MITIGATION				
Duration	Beyond project life (6)	If the mitigation measures are put into place, specifically the *in situ* conservation and management of the resource through an HSMP, the benefits may continue after the Project is complete.	Consequence: Moderately beneficial (12)	Significance: Minor – positive (72)
Extent	Very Limited (1)	The selection of the alternative routing will avoid the identified impact, which will result in a very limited impact.		
Intensity x type of impact	High - positive (5)	*In situ* conservation and management would constitute a minor change to a resource of Very High CS.		
Probability	Highly probable (6)	Should Kalgold implement the mitigations effectively, it is highly probable that the anticipated benefits will manifest.		

7.2.2. Operational Phase

Table 7-4 presents the activities expected to occur during the Operational Phase and the expected impacts to the cultural heritage landscape that may arise from these activities.

Table 7-4: Interactions and Impacts of Operational Phase Activities

Interaction	Impact
Drilling	Digby Wells envisages no impact to the cultural heritage landscape, given the nature of the proposed activities and the location of identified heritage resources in relation to the proposed Project infrastructure.
Transporting equipment and materials	
Managing water and effluent required for prospecting activities	
Waste generation	
Managing sewage from the contractor's area	

Digby Wells does not envisage any impact to the identified heritage resources from the above-mentioned activities and has therefore not assessed these impacts further in this report.

7.2.3. Decommissioning Phase

Table 7-5 presents the activities expected to occur during the Decommissioning Phase and the expected impacts to the cultural heritage landscape that may arise from these activities.

Table 7-5: Interactions and Impacts of Decommissioning Phase Activities

Interaction	Impact
Rehabilitation Activities	Digby Wells envisages no impact to the cultural heritage landscape, given the nature of the proposed activities and the location of identified heritage resources in relation to the proposed Project infrastructure. Should any infrastructure intended for demolition increase in age to older than 60 years during the Project lifecycle, the structure must be considered a heritage structure. Any alterations to these structures will be subject to a NHRA Section 34 permit application process

Digby Wells does not envisage any impact to the identified heritage resources from the above-mentioned activities and has therefore not assessed these impacts further in this report.

7.3. Cumulative Impacts

Cumulative impacts occur from in-combination effects of various impacts on heritage resources acting within a host of processes that result in an incremental effect. The importance of identifying and assessing cumulative impacts is that the whole is often greater than the sum of its parts. This implies that the total effect of multiple stressors or change processes acting simultaneously on a system may be greater than the sum of their effects when acting in isolation.

This Project in conjunction with other planned developments in line with the strategic development plans for the North West Province requires consideration to identify the possible in-combination effects of various impacts to known heritage resources. Table 7-6 presents a summary of the possible cumulative impacts of the Project.

Table 7-6: Summary of Potential Cumulative Impacts

Type	Cumulative Impact	Direction of Impact	Extent of Impact
Space-crowding	The proposed infrastructure will add to the existing infrastructure associated with activities characterising the area immediately surrounding the proposed Project area and further afield. This installation of this infrastructure will result in a loss of the area within which heritage resources can exist.	Negative	Limited

7.4. Unplanned and Low Risk Events

This section considers the potential risks to the protected heritage resource, as well as the potential heritage risks that could arise for Kalgold in terms of implementing the Project. These two aspects are discussed separately.

Section 0 above describes the heritage resource identified during the pre-disturbance survey; however, this is not an exhaustive list of all heritage resources within the proposed Project area. Should heritage resources be identified during Project activities, and where Kalgold knowingly does not take proactive management measures, potential risks to Kalgold may include litigation in terms of Section 51 of the NHRA and social or reputational repercussions. Table 7-7 presents a summary of the primary risks that may arise for Kalgold.

Table 7-7: Identified heritage risks that may arise for Kalgold

Description	Primary Risk
Heritage resources with a high CS rating are inherently sensitive to any development in so far that the continued survival of the resource could be threatened. In addition to this, certain heritage resources are formally protected thereby restricting various development activities.	Negative Record of Decision (RoD) and/or development restrictions issued by NWPHRA and/or SAHRA in terms of Section 38(8) of the NHRA.
Impacting on heritage resources formally and generally protected by the NHRA without following due process. Due process may include social consultations and/or permit application processes to SAHRA and/or NWPHRA	• Fines; • Penalties; • Seizure of Equipment; • Compulsory Repair / Cease Work Orders; and • Imprisonment.

Description	Primary Risk
Implementation of the 100 m buffer zone as required by SAHRA, which will cover approximately 4 ha of land.	• Land will be excised from the proposed Project area, which may have knock-on impacts in terms of the data collected from the proposed activities.

If additional heritage resources are identified during Project-related activities, the potential risks to those heritage resources will need to be assessed. Table 7-8 provides an overview of these potential unplanned events, the subsequent impact that may occur and mitigation measures and management strategies to remove or reduce these risks.

Table 7-8: Identified unplanned events and associated impacts

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Encountering unidentified *in situ* remnants of historical built environment resources during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 34 of the NHRA.	Establish Chance Find Procedures (CFPs) as a condition of the authorisation. Refer to Section 0 for more detailed recommendations.
Accidental exposure of *in situ* archaeological material during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA.	
Accidental exposure of *in situ* burial grounds or graves during the implementation of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA.	
Accidental exposure of human remains during the decommissioning and rehabilitation and closure phases of the Project.		

8. Environmental Management Programme

Table 8-1 below summarises the outcomes of the HRM process that must be included in the Environmental Management Programme (EMPr).

Table 8-1: Heritage Specialist Inputs into the Environmental Management Programme

Activities	Potential Impacts	Aspects Affected	Phase	Mitigation Measure	Mitigation Type	Time period for implementation
• All Project-related activities	Damage to or destruction of previously unidentified heritage resources.	Cultural Heritage	Construction Operation	• Develop and implement a CFP approved by the HRAs.	Control	Before the commencement of the Project

9. Monitoring Programme

Section 11 includes recommended mitigation measures and management strategies. These recommendations do not include a monitoring programme as no such programme is required.

10. Results of Consultation and Stakeholder Engagement

The Public Participation Process (PPP) required in terms of the NEMA as a component of the BA process has not been completed in part to date but will be completed as a process separate to the heritage specialist assessment. This consultation process affords Interested and Affected Parties (I&APs) opportunities to engage in the BA process. The objectives of the PPP or Stakeholder Engagement Process (SEP) include the following:

- To ensure that I&APs are informed about the project;
- To provide I&APs with an opportunity to engage and provide comment on the project;
- To draw on local knowledge by identifying environmental and social concerns associated with the project;
- To involve I&APs in identifying methods in which concerns can be addressed;
- To verify that stakeholder comments have been accurately recorded; and
- To comply with the legal requirements.

No formal consultation was undertaken as part of this assessment. Should any I&AP comments be submitted in relevance to heritage resources during the PPP, these will be considered in the final HBAR or BAR.

Site surveys can often present an opportunity for informal consultation with specific stakeholders (usually farm owners, managers and employees). This consultation can result in the identification of burial grounds and graves – importantly, sometimes with no visible surface markers – or in the identification of sacred sites or other places of importance, which may not otherwise be identified. During the pre-disturbance survey, representatives of the Kalgold operation (including exploration geologists and an intern within the environmental department) accompanied the heritage specialist. These representatives were aware of BGG-001 within the Project area and were not aware of any additional heritage resources.

11. Recommendations

Considering the nature and the scope of the Project, Digby Wells recommends the following additional recommendations be implemented prior to the commencement of the Project:

- Kalgold must avoid impacts to BGG-001 through an amendment of the location of proposed drill points 29 and 30, or excluding these points from the drilling programme to avoid the risk of direct impact and implement a 100 m no-go buffer zone around the heritage resource;

- Kalgold must develop and implement an HSMP to conserve BGG-001 *in situ*. Where Kalgold have developed such a management plan, this must be updated to include BGG-001;
- Where Project design amendments are not feasible, Kalgold will need to embark on a consultation process to assess whether a GRP is feasible; and
- To mitigate against potential direct impacts against previously unidentified heritage resources and where Kalgold has not done so already, Kalgold must develop and implement a CFP prior to the commencement of Project activities. This CFP must be approved by the Heritage Resource Authorities (HRAs) prior to implementation.

12. Reasoned Opinion Whether Project Should Proceed

Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided the recommendations detailed in Section 11 above are adopted.

12.1. Socio-economic Benefit versus Heritage Impacts

Based on a review of the applicable planning documents and available socio-economic data detailed in Section 6.3 above, the potential socio-economic benefits that will arise from the Project outweigh the identified risks and impacts to the known heritage resources within the site-specific study area. This statement is supported by the following statements:

- The identified impacts to the heritage resources can be mitigated through the recommendations included in Section 11 above; and
- Although not directly contributing to long-term employment opportunities, should the results of the Prospecting Activities provide positive results, the Project will contribute to the construction and operation of a gold mining operation. Such an operation will provide long-term and short-term employment opportunities and contribute to the regional and national economies directly and indirectly.

13. Conclusion

The aim of the HRM process was to comply with regulatory requirements contained within Section 38 of the NHRA through the following:

- Defining the cultural landscape within which the Project is situated;
- Identifying, as far as is feasible, heritage resources that may be impacted upon by the project as well as define the CS;
- Assessing the possible impacts to the identified heritage resources;
- Considering the socio-economic benefits of the Project; and
- Providing feasible mitigation and management measures to avoid, remove or reduce perceived impacts and risks.

These objectives were met as presented in Sections 6 through 12 above. Based on the understanding of the Project while considering the results of this assessment, Digby Wells does not object to the Project provided the recommendations detailed above are adopted.

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Appendix A: Glossary of Terms

GLOSSARY OF TERMS

Term	Definition
Archaeological	Material remains resulting from human activity that are in a state of disuse and older than 100 years, including: • Artefacts, human and hominid remains and artificial features and structures; • Rock art created through human agency older than 100 years, including any area within 10 m of such representation; • Wrecks older than 60 years - either vessels or aircraft - or any part thereof that was wrecked in South Africa on land, internal or territorial waters, and any cargo, debris or artefacts found or associated therewith; and • Features, structures and artefacts associated with military history that are older than 75 years and the sites on which they are found, e.g., battlefields.
Archaeologist	A trained professional who uses scientific methods to excavate, record and study archaeological sites and deposits.
Artefact	Any object manufactured or modified by human beings.
Burial Grounds and Graves Consultation (BGGC)	The regulated consultation process required in terms of Section 36 of the NHRA and Regulation GNR 548 to the NHRA when burial grounds and graves are identified within a project area.
Ceramic (syn. pottery)	In an archaeological context any vessel or other object produced from natural clay that has been fired. Indigenous ceramics associated with Farming Communities are low-fired wares, typically found as potsherds. Imported and more historic ceramics generally include high-fired wares such as porcelain, stoneware, for example.
Ceramic facies / facies	Subgroups of a primary ceramic tradition or sequence. Typically used in ceramic analyses. Various facies are attributed to different temporal periods based of radiometric dates obtained from archaeological contexts. Facies are often used to infer cultural identity of archaeological groups. However, in context of this study identified ceramic facies merely provide a relative temporal context for archaeological sites in the landscape.
Ceramic tradition	The sequence of ceramic styles that develop out of each other and form a continuum. A tradition is the primary group to which subsequent ceramic facies belong. A ceramic tradition can be broadly associated with various linguistic and cultural groups, but do not represent any given ethnic identity, especially during the LFC period.

Term	Definition
Conservation	In relation to heritage resources includes the protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance.
Cultural significance (CS)	The aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. A heritage may have cultural significance or other special value because of its: • Importance in the community, or pattern of South Africa's history; • Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage; • Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage; • Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects; • Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group; • Importance in demonstrating a high degree of creative or technical achievement at a particular period; • Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; • Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and/or • Significance relating to the history of slavery in South Africa.
Development	Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including: • Construction, alteration, demolition, removal or change of use of a place or a structure at a place; • Carrying out any works on or over or under a place; • Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place; • Constructing or putting up for display signs or hoardings; • Any change to the natural or existing condition or topography of land; and • Any removal or destruction of trees, or removal of vegetation or topsoil.

Term	Definition
Early Farming Community/ies (EFC)	The first Farming Communities (also known as Early Iron Age) that appear in the southern archaeological record during the early first millennium CE. The EFC period is generally dated from c. 200 CE to 1000 CE.
Early Stone Age (ESA)	The South African ESA dates from ~3 Mya to c. 250 Kya. This period is associated with later *Australopithecus and* early *Homo* species. The lithic industries that characterise the ESA include Oldowan and Early Acheulian, typically as simple core tools, choppers handaxes and cleavers.
Excavation	The scientific excavation, recording and retrieval of archaeological deposit and objects through the use of accepted archaeological procedures and methods, and excavate has a corresponding meaning.
Farming Community/ies	Term signifying the appearance in the southern African archaeological of Bantu-speaking agricultural based societies from the early first millennium CE. The term replaces the *Iron Age* as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking. The Farming Community period is divided into an Early and Late phase. The use of Later Farming Communities especially removes the artificial boundary between archaeology and history.
Field Rating (FR)	SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA that provides a three-tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories: • Grade I: Heritage resources with qualities so exceptional that they are of special national significance; • Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; • Grade III: Other heritage resources worthy of conservation; and • General Protected: i.e., in terms of Sections 33 to 37 of the NHRA.
Formal protection	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.

Term	Definition
General protection	General protections are afforded to: • Objects protected in terms of laws of foreign states. • Structures older than 60 years. • Archaeological and palaeontological sites and material and meteorites. • Burial grounds and graves. • Public monuments and memorials.
Grave	A place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
Heritage Impact Assessment (HIA)	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
Heritage resource	Any place or object of cultural significance.
Heritage resources management	Process required when development is intended categorised as: • Any linear development exceeding 300m in length. • Construction of a bridge or similar structure exceeding 50 m in length. • Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority. • Re-zoning of a site exceeding one hectare in extent. • Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Heritage site	Any place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a Provincial Heritage Resource Authority (PHRA).

Term	Definition
Late Farming Community/ies (LFC)	Farming Communities who either developed / evolved from EFC groups, or who migrated into southern African from the late first millennium / early second millennium CE. The LFC period evidences distinct changes in socio-political organisation, settlement patterns, trade and economic activities, including extensive trade routes. The LFC period is generally dated from c. 1000 CE well into the modern historical period of the nineteenth century.
Later Stone Age (LSA)	The South African LSA dates from ~30 Kya. This period is associated with modern *Homo sapiens sapiens* and the complex hunter-gatherer societies, ancestral to the Bushmen / San and Khoi. The LSA lithic assemblage contains microlithic technology and composite tools such as arrows commonly produced from fine-grained cryptocrystalines, quarts and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.
Living / intangible heritage	The intangible aspects of inherited culture that could include cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems, the holistic approach to nature, society and social relationships.
Management	In relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the NHRA.
Middle Stone Age (MSA)	The South African MSA dates from ~300 Kya to c. 30 Kya. This period is associated with the changing behavioural patterns and the emergence of modern cognitive abilities in early *Homo sapiens species.* The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.

Term	Definition
National estate	The national estate as defined in Section 3 of the NHRA, i.e., heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include: • Places, buildings, structures and equipment of cultural significance; • Places to which oral traditions are attached or which are associated with living heritage; • Historical settlements and townscapes; • Landscapes and natural features of cultural significance; • Geological sites of scientific or cultural importance; • Archaeological and palaeontological sites; • Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003; • Sites of significance relating to the history of slavery in South Africa; • Movable objects, including objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest; and • Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
Palaeontological	Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance.
Palaeontologist	A trained professional who uses scientific methods to excavate, collect, record and study palaeontological sites and fossils.
Pedestrian survey	A method of examining a site in which surveyors, spaced at regular intervals, systematically walk over the area being investigated.

Term	Definition
Phase 1 Archaeological Impact Assessment (AIA)	Phase 1 AIAs generally involve the identification and assessment of sites during a field survey of a portion of land that is going to be affected by a potentially destructive or landscape-altering activity.
Phase 2 Archaeological Impact Assessment (AIA)	Phase 2 AIAs are primarily based on salvage or mitigation excavations preceding development that will destroy or impact on a site. This may involve collecting of artefacts from the surface and / or excavation of representative samples of the artefactual material to allow characterisation of the site and the collection of suitable materials for dating the sites. Phase 2 AIAs aim to obtain a general idea of the age, significance and meaning of the site that is to be lost and to store a sample that can be consulted at a later date for research purposes. Phase 2 excavations can only be done under a permit issued by SAHRA, or other appropriate heritage agency, to the appointed archaeologist.
Phase 3 Management Plan / Conservation Management Plan (CMP)	On occasion, a site may require a Phase 3 programme involving the modification of the site or the incorporation of the site into the development itself as a site museum, a special conservation area or a display. Alternatively, it is often possible to relocate or plan the development in such a way as to conserve the archaeological site or any other special heritage significance the place may have. For example, in a wilderness area or open space when sites are of public interest the development of interpretative material is recommended and adds value to the development. Permission for the development to proceed can be given only once the heritage resources authority is satisfied that measures are in place to ensure that the archaeological sites will not be damaged by the impact of the development or that they have been adequately recorded and sampled. Careful planning can minimise the impact of archaeological surveys on development projects by selecting options that cause the least amount of inconvenience and delay. The process as explained above allows the rescue and preservation of information relating to our past heritage for future generations. It balances the requirements of developers and the conservation and protection of our cultural heritage as required of SAHRA and the provincial heritage resources authorities (ASAPA).
Pre-disturbance survey (syn. reconnaissance)	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.

Term	Definition
Reconnaissance	A broad range of techniques involved in the location of archaeological sites, e.g., surface survey and the recording of surface artefacts and features, the sampling of natural and mineral resources, and sometimes testing of an area to assess the number and extent of archaeological resources. However, in terms of South African practice, reconnaissance during a so-called Phase 1 AIA never includes sampling as this is a permitted activity, usually undertaken during so-called Phase 2 AIAs (ASAPA).
Site	Any area of land, including land covered by water, and including any structures or objects thereon.
Structure	Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.
Tangible heritage	Physical heritage resources such as archaeological sites, historical buildings, burial grounds and graves, fossils. Tangible heritage may be associated with intangible elements, e.g., the living cultural traditions, rituals and performances associated with burial grounds and graves and deceased persons.

DIGBY WELLS
ENVIRONMENTAL

Appendix B: Specialist CV

Miss Shannon Hardwick

Heritage Resources Management Consultant

Social and Heritage Services

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2019	Heritage Resources Management short course (Continued Professional Development Programme)	University of Cape Town
2013	MSc (Archaeology)	University of the Witwatersrand
2010	BSc (Honours) (Archaeology)	University of the Witwatersrand
2009	BSc	University of the Witwatersrand
2006	Matric	Rand Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Fair	Basic

3 Employment

Period	Company	Title/position
2019 to Present	Digby Wells Environmental	Heritage Resources Management Consultant
2017 to 2019	Digby Wells Environmental	Assistant Heritage Resources Management Consultant
2017 to 2017	Digby Wells Environmental	Social and Heritage Services Intern
2016 to 2017	Tarsus Academy	Facilitator
2011 to 2016	University of the Witwatersrand	Teaching Assistant
2011	University of the Witwatersrand	Collections Assistant

4 Experience

I joined the Digby Wells team in May 2017 as a Heritage Management Intern and have most recently been appointed as a Heritage Resources Management Consultant. I am an archaeologist and obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. I am a published co-author of one paper in *Journal of Ethnobiology*.

Since joining Digby Wells, I have gained generalist experience through the compilation of various heritage assessments, including Notification of Intent to Develop (NIDs), Heritage Scoping Reports (HSRs), Heritage Impact Assessment (HIA) reports, Heritage Basic Assessment Reports (HBARs) and applications to undertake permitted activities in terms of Sections 34 and 35 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). I have undertaken heritage mitigations including those permitted under Section 35 of the NHRA and I am currently gaining experience in Grave Relocation Processes (GRPs).

Besides heritage experience, I have also obtained experience in compiling socio-economic documents, including a Community Health, Safety and Security Management Plan (CHSSMP) and social baselines and data analysis for projects in South Africa, Malawi, Mali and Sierra Leone. I have also had experience in terms of auditing clients according to their environmental commitments.

My fieldwork experience includes heritage pre-disturbance surveys and impact assessments in South Africa, Malawi and the Democratic Republic of the Congo and social fieldwork in Malawi. All but one of these international projects conformed to the requirements of the International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability (PS) (2012).

I am a registered member of the Association of Southern African Professional Archaeologists (ASAPA) and the International Council on Monuments and Sites (ICOMOS).

5 Project Experience

The table below presents the Projects in which I have participated in Digby Wells throughout my employment.

Project Experience at Digby Wells

Project Title	Client	Project Location	Completed	Project Experience
Cultural Heritage Management and Grave Relocation Process in support of the North Eastern Waste Rock Dump Extension Readiness at the Mogalakwena Platinum Mining Complex	Anglo American Platinum	Mokopane, Limpopo	Ongoing	Section 35 Permit Application Process Section 36 Permit Application and Grave Relocation Processes
Mafube Resettlement Action Plan and Grave Relocation Process	Mafube Coal Mining (Pty) Ltd	Middelburg, Mpumalanga	Ongoing	Section 36 Permit Application and Grave Relocation Processes
Environmental and Social Impact Assessment for the Sanankora Gold Mine Project	Cora Gold Limited	Koulikoro Region, Mali	Ongoing	Heritage Impact Assessment Process In-country consultant support
Environmental Authorisation Process for the Expansion of the Copper Sunset Mining Right Area	Copper Sunset Sands (Pty) Ltd	Viljoensdrift, Free State	Ongoing	Heritage Impact Assessment Process
Amendments to Environmental Licences associated with the West Rand Tailings Retreatment Project	Far West Gold Recoveries (Pty) Ltd	West Rand District Municipality, Gauteng	Ongoing	Heritage Impact Assessment Process
Regional Tailings Storage Facility Heritage Mitigations	Ergo Mining (Pty) Ltd	Randfontein, Gauteng	Ongoing	Section 34 Permit Application Process
City Deep 4L2 Mine Dump Heritage Management	Ergo Mining (Pty) Ltd	Johannesburg, Gauteng	Ongoing	Rescue Permit Application Process

Project Title	Client	Project Location	Completed	Project Experience
Exxaro Dorstfontein East Coal Mine Expansion Project	Exxaro Coal Central (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Grave Relocation Process at the Exxaro Matla Mine 1 Development Footprint	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Section 36 Permit Application and Grave Relocation Processes
Environmental Authorisation for the proposed Musina-Makhado Special Economic Zone Development Project, Limpopo Province	Limpopo Economic Development Agency	Vhembe District Municipality, Limpopo	Ongoing	Heritage Impact Assessment Process Project Management
Lesotho Lowlands Water Development Project Phase II Heritage Impact Assessment	Lesotho Lowlands Water Development Project Phase II	Leribe and Berea Districts, Lesotho	Ongoing	Heritage Impact Assessment Process In-country consultant support Project Management
Songwe Hills Rare Earth Elements Project	Mkango Resources Limited	Phalombe District, Malawi	Ongoing	Heritage Impact Assessment Process
Environmental Authorisation Processes for the Blinkwater, Lisbon and Moorddrift Prospecting Right Applications	PalRho Exploration (Pty) Ltd	Mokopane, Limpopo	Ongoing	Heritage Basic Assessment Report (desktop)
Environmental and Social Impact Assessment for the Kalimva and Ikamva Satellite Pits and Updating of the Kibali Gold Project	Kibali Gold Mine	Orientale Province, Democratic Republic of the Congo	Ongoing	Heritage Impact Assessment Process In-country consultant support

Project Title	Client	Project Location	Completed	Project Experience
The South African Radio Astronomy Observatory Square Kilometre Array Phase 2 Heritage Mitigations	South African Radio Astronomy Observatory	Carnarvon, Northern Cape	Ongoing	Section 34 Permit Application Process Section 35 Permit Application Process and Mitigations Heritage Impact Assessment – Addendum Training Development and Implementation
Kroonstad Gas Exploration Project	Shango Solutions (Pty) Ltd	Kroonstad, Free State	Ongoing	Heritage Impact Assessment Process Project Management
Kroonstad South Section 102 Amendment Project	Shango Solutions (Pty) Ltd	Kroonstad, Free State	Ongoing	Heritage Impact Assessment Process Project Management
Rustenburg Base Metals Refinery Bulk Chemical Storage Facility Relocation Project	SRK Consulting (South Africa) Pty Ltd	Rustenburg, North West	Ongoing	Heritage Impact Assessment Process Project Management
Regulation 31 Amendment Report and Environmental Management Programme for Listed Activities and Amendment associated with the Sweet Sensation Sand Mine	Sweet Sensations Vaal Sand (Pty) Ltd	Vaal Eden, Free State	Ongoing	Heritage Site Management Plan Chance Finds Procedure

Project Title	Client	Project Location	Completed	Project Experience
Environmental Authorisation for the Proposed New Infrastructure at the Universal Coal Development III (Pty) Ltd Ubuntu Colliery	Universal Coal Development III (Pty) Ltd	Delmas, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Proposed Dalyshope Coal Mining Project	Anglo Operations (Pty) Ltd	Lephalale, Limpopo	Ongoing	Heritage Impact Assessment Process
Proposed Environmental Regulatory Process for the Middeldrift Resources within the Existing New Clydesdale Colliery Mining Right	Universal Coal Development IV (Pty) Ltd	Kriel, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Proposed Arnot South Coal Mining Project	Exxaro Coal Mpumalanga (Pty) Ltd	Hendrina, Mpumalanga	Ongoing	Heritage Impact Assessment Process
Basic Assessment Process for the Closure of the Cooke Underground Operations	Sibanye Gold Limited	Randfontein, Gauteng	March 2021	Heritage Impact Assessment Process
Weltervreden Mine Environmental Authorisation, Water Use Licence and Mining Right Application Project	Mbuyelo Group (Pty) Ltd	Belfast, Mpumalanga	March 2021	Heritage Impact Assessment Process
Basic Assessment and Regulation 31 Amendment Processes for the Authorisation of Listed Activities and Amendment of the Environmental Impact Assessment and Environmental Management Plan for the Ixia Coal (Pty) Ltd Imvula Mine	Ixia Coal (Pty) Ltd	Kriel, Mpumalanga	November 2020	Heritage Basic Assessment Report
Burial Ground Site Inspection adjacent to the Goedgevonden Colliery	Glencore Operations South Africa (Pty) Ltd	Ogies, Mpumalanga	November 2020	Site Inspection and Report

Project Title	Client	Project Location	Completed	Project Experience
Belfast Coal Mine Grave Inspection	Exxaro Coal Mpumalanga (Pty) Ltd	Belfast, Mpumalanga	September 2020	Site Inspection and Report
Basic Assessment and Regulation 31 Amendment / Consolidation for Sigma Colliery: Mooikraal and Sigma Colliery: 3 Shaft	Sasol Mining (Pty) Ltd	Sasolburg, Free State	September 2020	Notification of Intent to Develop and Request for Exemption
Mining Permit Applications to undertake Sand Mining at the New Vaal Colliery	Copper Sunset (Pty) Ltd	Vereeniging, Free State	July 2020	Heritage Basic Assessment Report
Environmental Impact Assessment for the Klipspruit Colliery Water Treatment Plant and associated pipeline, Mpumalanga	South32 SA Coal Holdings (Pty) Ltd	Ogies, Mpumalanga	May 2020	Notification of Intent to Develop and Request for Exemption Social baseline
Environmental Authorisation for the Dagsoom Coal Mining Project near Ermelo, Mpumalanga Province	Dagsoom Coal Mining (Pty) Ltd	Ermelo, Mpumalanga	April 2020	Heritage Impact Assessment Process
Proposed construction of a Water Treatment Plant and associated infrastructure for the Treatment of Mine-Affected Water at the Kilbarchan Colliery	Eskom Holdings SOC Limited	Newcastle, KwaZulu-Natal	March 2020	Heritage Impact Assessment Process
External Environmental Audits of the Sasol Retail Stations in the Limpopo, North West, Free State, Mpumalanga and Northern Cape Province	Sasol Limited's South African Energy Business	Thirteen locations in Mpumalanga, North West, Free State and Northern Cape	March 2020	Environmental Audit and Report

Project Title	Client	Project Location	Completed	Project Experience
Environmental Management Programme Performance Assessment for the Impumelelo Colliery near Greylingstad, Mpumalanga	Sasol Mining (Pty) Ltd	Greylingstad, Mpumalanga	January 2020	Environmental Performance Audit and Report
Environmental Authorisation for the Temo Mine proposed Rail, Road and Pipeline Development, Limpopo Province	Temo Coal Mining (Pty) Ltd	Lephalale, Limpopo	November 2019	Heritage Impact Assessment Process Social baseline
Heritage Resources Management Process for the Proposed Upgrade of the Dersley Outfall Sewer Line, Ekurhuleni, Gauteng	Information Decision Systems (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	July 2019	Archaeological Impact Assessment Process Project Management
Environmental Authorisation for the proposed Lephalale Pipeline Project, Limpopo Province	MDT Environmental (Pty) Ltd	Lephalale, Limpopo	October 2019	Notification of Intent to Develop & Request for Exemption
Heritage Resources Management Process Update for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	September 2019	Heritage Site Management Plan Update
Environmental Authorisation Process to Decommission a Conveyor Belt Servitude, Road and Quarry at Twistdraai East Colliery	Sasol Mining (Pty) Ltd	Secunda, Mpumalanga	August 2019	Notification of Intent to Develop and Request for Exemption
Environmental Impact Assessment for the proposed Future Developments within the Sun City Resort Complex	Sun International (Pty) Ltd	Rustenburg, North West	August 2019	Heritage Impact Assessment Process Conservation Management Plan Social Baseline

Project Title	Client	Project Location	Completed	Project Experience
Environmental Authorisation for the Nomalanga Estates Expansion Project, KwaZulu-Natal	Nomalanga Property Holdings (Pty) Ltd	Greytown. KwaZulu-Natal	July 2019	Heritage Impact Assessment Process
City Deep 4L2 Mine Dump Heritage Management Process	Ergo Mining (Pty) Ltd	Johannesburg, Gauteng	July 2019	Site Inspection and Report
Proposed John Dube Extension 3 Township situated on Portions of Remaining Extent 1 and 83 of the farm Grootfontein 165 IR, Gauteng Province	Envirolution Consulting (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	July 2019	Desktop Social Assessment
Constructed Landfill Site for the Sierra Rutile Limited Mining Operation, Southern Province, Sierra Leone	Sierra Rutile Limited	Southern Province, Sierra Leone	May 2019	Social Impact Assessment
Environmental and Social Impact Assessment for the Bougouni Lithium Project, Mali	Kodal Minerals Limited	Sikasso region, Mali	May 2019	Heritage Impact Assessment Process In-country consultant support
Belfast Implementation Project	Exxaro Coal Mpumalanga (Pty) Ltd	Belfast, Mpumalanga	March 2019	Section 34 Permit Application
Newcastle Landfill Project	GCS Water and Environmental Consultants	Newcastle, KwaZulu-Natal	March 2019	Heritage Impact Assessment Process
Elandsfontein Colliery Burial Grounds and Graves Chance Finds	Anker Coal and Mineral Holdings SA (Pty) Ltd Elandsfontein Colliery (Pty) Ltd	Clewer, Emalahleni, Mpumalanga	December 2018	Site Inspection and Report Project Management

Project Title	Client	Project Location	Completed	Project Experience
Environmental Impact Assessment for the Blyvoor Gold Mining Project near Carletonville, Gauteng Province	Blyvoor Gold Capital (Pty) Ltd	Carletonville, Gauteng	December 2018	Notification of Intent to Develop and Request for Exemption Social Baseline
Gorumbwa RAP Audit	Randgold Resources Limited	Kibali Sector, Democratic Republic of the Congo	December 2018	Resettlement Action Plan Audit (data management)
Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed Rover Diversion and Flood Protection Berms	Sasol Mining (Pty) Ltd	Sasolburg, Free State	November 2018	Notification of Intent to Develop and Request for Exemption
Heritage Resources Management Process for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	October 2018	Heritage Impact Assessment Process
Environmental and Social Input for the Pre-Feasibility Study	Birimium Gold	Bougouni, Mali	October 2018	Pre-Feasibility Study; Heritage Impact Assessment Process
Environmental and Social Impact Assessment for the Bougouni Lithium Project, Mali	Future Minerals S.A.R.L.	Bougouni, Mali	July 2018	Heritage Impact Assessment Process
The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project	The South African Radio Astronomy Observatory (SARAO)	Carnarvon, Northern Cape	July 2018	Heritage Impact Assessment Process Conservation Management Plan
Sasol Mining Sigma Colliery Ash Backfilling Project, Sasolburg, Free State Province	Sasol Mining (Pty) Ltd	Sasolburg, Free State	July 2018	Heritage Basic Assessment Report Update

Project Title	Client	Project Location	Completed	Project Experience
Liwonde Additional Studies	Mota-Engil Africa	Liwonde, Malawi	June 2018	Community Health, Safety and Security Management Plan Social Fieldwork
NHRA Section 34 Permit Application process for the Davin and Queens Court Buildings on Erf 173 and 174, West Germiston, Gauteng Province	IDC Architects	Johannesburg, Gauteng	May 2018	Section 34 Permit Application Process
Basic Assessment and Environmental Management Plan for the Proposed pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province	HCI Coal (Pty) Ltd Mbali Colliery	Ogies, Mpumalanga	February 2018	Heritage Basic Assessment Report
Heritage Resources Management Process for the Exxaro Matla Mine	Exxaro Coal Mpumalanga (Pty) Ltd	Kriel, Mpumalanga	January 2018	Heritage Impact Assessment Process
Environmental Impact Assessment for the Millsite TSF Complex	Sibanye-Stillwater	Randfontein, Gauteng	December 2017	Heritage Baseline Compilation
Environmental Fatal Flaw Analysis for the Mabula Filling Station	Mr van den Bergh	Waterberg, Limpopo	November 2017	Fatal Flaw Analysis
NHRA Section 35 Archaeological Investigations, Lanxess Chrome Mine, North-West Province	Lanxess Chrome Mine (Pty) Ltd	Rustenburg, North West	August 2017	Archaeological Phase 2 Mitigation
Heritage Resources Management Process for the Portion 296 of the farm Zuurfontein 33 IR Proposed Residential Establishment Project	Shuma Africa Projects (Pty) Ltd	Ekurhuleni (Johannesburg), Gauteng	June 2017	Notification of Intent to Develop and Request for Exemption

6 Professional Affiliations and Registrations

Position	Professional Body	Member Number
Member	Association of Southern African Professional Archaeologists (ASAPA)	451
Member	International Council on Monuments and Sites (ICOMOS)	38048

7 Publications

Esterhuysen, A.B. & Hardwick, S.K. 2017. Plant remains recovered from the 1854 siege of the Kekana Ndebele, Historic Cave, Makapan Valley, South Africa. *Journal of Ethnobiology* 37(1): 97-119.

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Appendix C: HRM Methodology

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Cultural Significance, Field Rating and Impact Assessment

Methodology Statement

Project Number:

ZZZ9999

Prepared for:

Internal Document

June 2019

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Methodology Statement**
Project Name:	**Cultural Significance, Field Rating and Impact Assessment**
Project Code:	**ZZZ9999**

Revision History

Name	Responsibility	Version	Date
Johan Nel ASAPA Member 095	HRM Unit Manager	Ver. 1	May 2014
		Ver. 2	October 2014
		Ver. 3	May 2015
Justin du Piesanie ASAPA Member 270	Divisional Manager: Social and Heritage Services	Ver. 4	January 2016
		Ver. 5	June 2016
		Ver. 6	June 2019

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1 Introduction

Cultural heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures, are finite, non-renewable and irreplaceable. Considering the innate value of cultural heritage resources, Heritage Resources Management (HRM) acknowledges that these have lasting worth as evidence of the origins of life, humanity and society. It is incumbent of the assessor to determine the cultural significance[1] (CS) of cultural heritage resources to allow for the implementation of appropriate management. This is achieved through assessing cultural heritage resources' value relative to certain prescribed criteria encapsulated in policies and legal frameworks, such as the South African National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

Commensurate to the NHRA, with specific reference to Section 38, this methodology aims to ensure that clients protect cultural heritage during implementation of project activities by either avoiding, removing or reducing the intensity of adverse impacts to tangible[2] and intangible[3] cultural heritage resources within the defined area of influence.

The methodology to define CS and assess the potential effects of a project is discussed separately in the sections below.

2 Evaluation of Cultural Significance and Field Ratings

2.1 Cultural Significance Determination

Digby Wells developed a CS Determination Methodology to assign identified cultural heritage resources with a numerical CS rating in an objective as possible way and that can be independently reproduced provided that the same information sources are used, should this be required.

This methodology determines the intrinsic, comparative and contextual significance of identified cultural heritage resources by considering their:

1. Importance rated on a six-point scale against four criteria; and
2. Physical integrity rated on a five-point scale.

[1] Cultural significance is defined as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a cultural heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

[2] (i) Moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls.

[3] Cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

The assigned ratings consider information obtained through a review of available credible sources and representativity or uniqueness (i.e. known examples of similar resources to exist), as well as the current preservation *status-quo* as observed.

Figure 2-2 depicts the CS formula and importance criteria, and it describes ratings on the importance physical integrity scales

2.2 Field Rating Determination

Grading of heritage resources remains the responsibility of heritage resources authorities. However, the South African Heritage Resources Agency (SAHRA) Minimum Standards requires heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. Section 7 of the NHRA provides for a system of grading of heritage resources that form part of the national estate and distinguishes between three categories.

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation is done as objectively as possible by integrating the field rating into the significance matrix.

Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with Section 8 of the NHRA. Figure 2-1 presents the formula and the parameters used to determine the Field Ratings.

Field Rating = Average Sum of Aesthetic + Historic + Scientific + Social

rated against

Value	Field Rating	Designation	Authority
0	Resource not assessed	None	None
1	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with negligible significance	Grade IV C	Local
2	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with low significance	Grade IV B	
3	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with medium-high significance	Grade IV A	
4	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with high significance	Grade III B	
5	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with very high significance	Grade II A	
6	Resources under formal protection that can be considered to have special qualities that make them significant within a province or region	Grade II	Provincial
7	Resources under formal protection that can be considered to have special qualities that make them significant within a national or international context	Grade I	National

Figure 2-1: Field Ratings Methodology

IMPORTANCE = AVERAGE SUM OF AESTHETIC + HISTORIC + SCIENTIFIC + SOCIAL

where

Aesthetic
Importance in aesthetic characteristics

Degree of technical / creative skill at a particular period

Historic
Importance to a community or pattern in the country's history

Site of significance relating to the history of slavery

Association with the life work of a person, group or organisation of importance in the history of the country

Scientific
Possession of uncommon, rare or endangered natural or cultural heritage aspects

Potential to yield information

Importance in demonstrating principle characteristics

Social
Association to a community or cultural group for social, cultural or spiritual reasons

rated against

IMPORTANCE: a site or heritage resource may be important in terms of one or more dimensions - aesthetic, historic, scientific and social. Each dimension consists of one or more attributes against which importance is determined. Importance of each dimension and subsequent attributes must be considered in relation to the resource's authenticity. Importance ratings must be informed and motivated by certain information sources. The credibility of information sources must therefore be evaluated and referred to when importance is discussed.	
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.
1	Common, well represented throughout diverse cultural landscapes
2	Generally well represented but exhibits superior qualities in comparison to other similar examples
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.
4	Rare and uncommon, value of national importance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.
-	Not assessed - dimension and/or attribute not considered in determining value.

×

Integrity
Physical status quo of preservation from observation

rated against

INTEGRITY: the undivided or unbroken state, material wholeness, completeness or entirety of a resource or site	
0	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost
1	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting
2	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting
3	Fabric well preserved, good quality information and meaning evident, limited encroachment
4	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting

Figure 2-2: CS Determination Methodology

3 Impact Assessment Methodology

The rationale behind CS determination recognises that the value of a cultural heritage resource is a direct indication of its sensitivity to change (impacts) as well as the maximum acceptable levels of change to the resource. Therefore, the assessor must determine CS prior to the completion of any impact assessment.

These requirements in terms of international best practice standards are integrated into the impact assessment methodology to guide both assessments of impacts and recommendations for mitigation and management of resources.

The following are terms and definitions applicable to the Environmental Impact Assessment (EIA) concept (ISO 14001):

- **Project Activity:** Activities associated with the Project that result in an environmental interaction during various phases, i.e. construction, operation and decommissioning, e.g., new processing plant, new stockpiles, development of open pit, dewatering, water treatment plant;
- **Environmental Interaction:** An element or characteristic of an activity, product, or service that interacts or can interact with the environment. Environmental interactions can cause environmental impacts (but may not necessarily do so). They can have either beneficial impacts or adverse impacts and can have a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change;
- **Environmental Aspect:** Various natural and human environments that an activity may interact with. These environments extend from within the activity itself to the global system, and include air, water, land, flora, fauna (including people) and natural resources of all kinds; and
- **Environmental Impact:** A change to the environment that is caused either partly or entirely by one or more environmental interactions. An environmental interaction can have either a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change. In addition, it can have either a beneficial environmental impact or an adverse environmental impact.

The assessment process identified potential issues and impacts through examination of:

- Project phases and activities,
- Interactions between activities and the environmental aspect; and
- The interdependencies between environmental aspects.

Figure 3-1 presents a graphical summary of this concept and Figure 3-2 provides an example of the process.

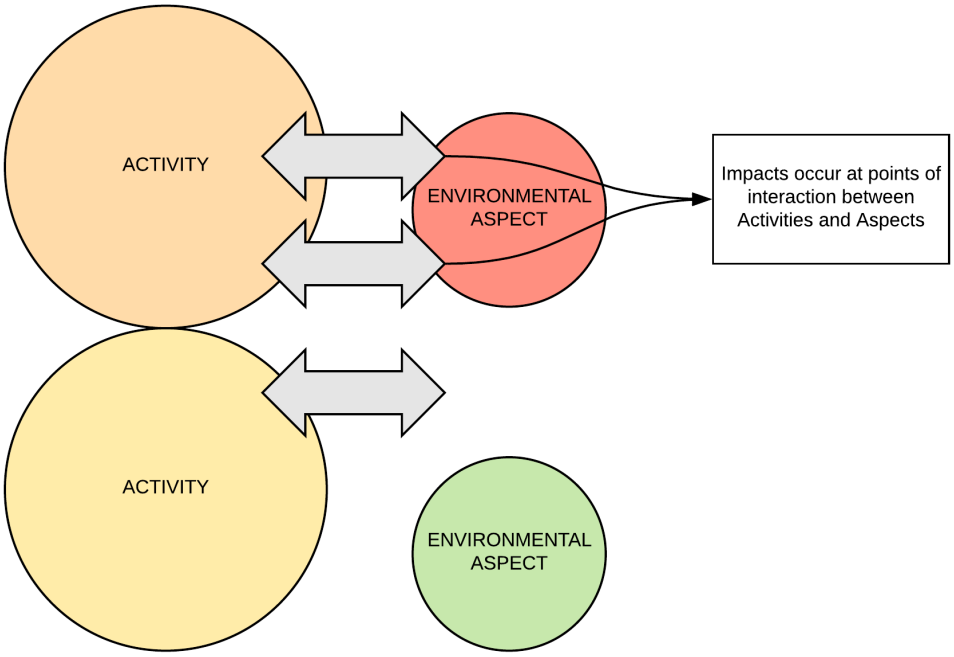

Figure 3-1: Graphical Representation of Impact Assessment Concept

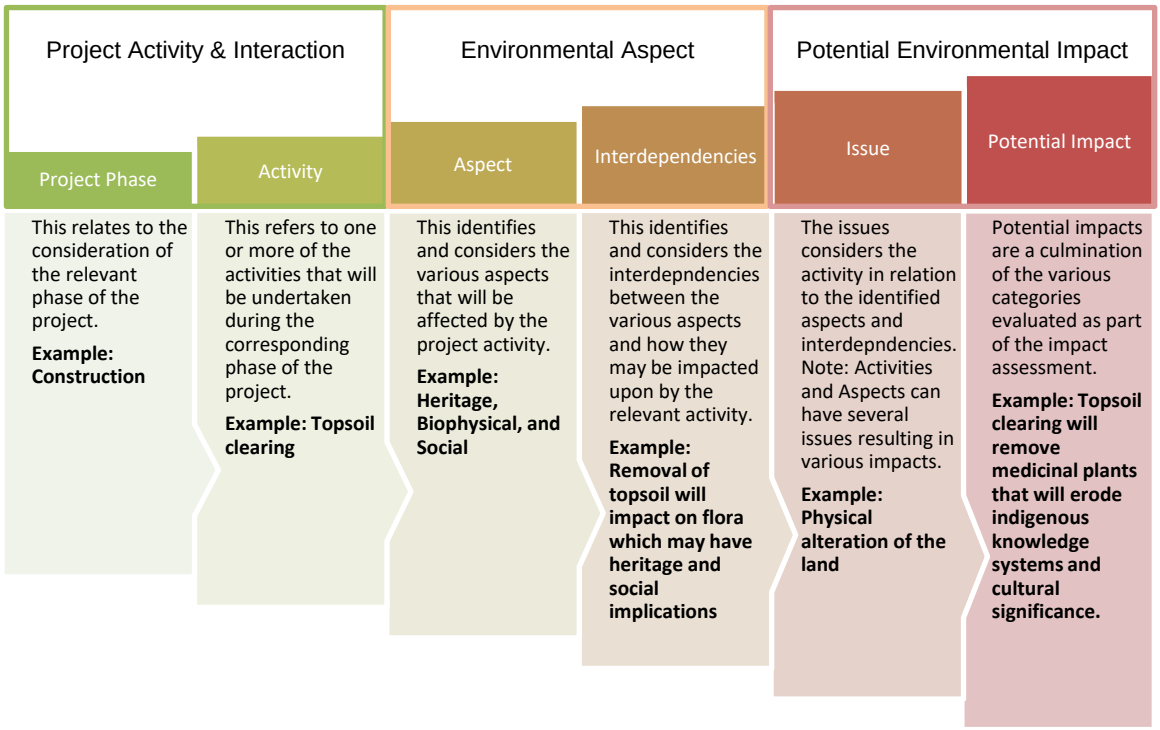

Figure 3-2: Example of how Potential Impacts are considered

3.1 Categorising Impacts to Cultural Heritage

Impacts may manifest differently among geographical areas and diverse communities. For instance, impacts to cultural heritage resources can simultaneously affect the tangible cultural heritage resource and have social repercussions. The severity of the impact is compounded when the intensity of physical impacts and social repercussions differ significantly, e.g. removal of a grave surface dressings results in a minor physical impact but has a significant social impact. In addition, impacts to cultural heritage resources can influence the determined CS without a physical impact taking place. Given this reasoning, impacts as considered here are generally placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary impacts** affect the fabric or physical integrity of the cultural heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking. For example, the destruction of a low-density scatter of archaeological material culture may be assessed as a negatively high impact if CS is not considered;
- **Indirect, induced or secondary impacts** can occur later in time or at a different place from the causal activity, or because of a complex pathway. For example, restricted access to a cultural heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the cultural heritage resource is not affected through any primary impact, its CS is affected, which can ultimately result in the loss of the resource itself; and
- **Cumulative impacts** result from in-combination effects on cultural heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
  - **Additive**: the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area;
  - **Synergistic**: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area;
  - **Time crowding**: frequent, repetitive impacts on a cultural heritage resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building;
  - **Neutralizing**: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area; and/or

- **Space crowding**: high spatial density of impacts on a cultural heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The fact that cultural heritage resources do not exist in isolation from the wider natural, social, cultural and heritage landscape demonstrates the relevance of the above distinctions: CS is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

3.2 Impact Assessment

The impact assessment process is designed to provide a numerical rating of the identified potential impacts. This methodology follows the established impact assessment formula:

Impact = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Duration + Extent + Intensity)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive) or -1 (negative)

Table 3-1 presents a description of the duration, extent, intensity and probability ratings. The intensity rating definitions consider the determined CS of the identified cultural heritage resources. These criteria are used to determine the impact ratings as defined in Table 3-2 below. Table 3-3 represents the relationship between consequence, probability and significance.

The impact assessment process considers pre- and post-mitigation scenarios with the intention of managing and/or mitigating impacts in line with the EIA Mitigation Hierarchy, i.e. avoiding all impacts on cultural heritage resources. Where Project-related mitigation does not avoid or sufficiently minimise negative impacts on cultural heritage resources, mitigation of these resources may be required.

Table 3-1: Description of Duration, Extent, Intensity and Probability Ratings Used in the Impact Assessment

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.			
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
7	**Permanent**	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	**International**	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	**Extremely high**	Major change to Heritage Resource with High-Very High Value	**Certain/Definite**	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	**Beyond Project Life**	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	**National**	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	**Very high**	Moderate change to Heritage Resource with High-Very High Value	**High probability**	Happens often. It is most likely that the impact will occur.
5	**Project Life**	The impact will cease after project life.	**Region**	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	**High**	Minor change to Heritage Resource with High-Very High Value	**Likely**	Could easily happen. The impact may occur.
4	**Long Term**	Impact will remain for >50% - Project Life	**Municipal area**	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	**Moderately high**	Major change to Heritage Resource with Medium-Medium High Value	**Probable**	Could happen. Has occurred here or elsewhere
3	**Medium Term**	Impact will remain for >10% - 50% of Project Life	**Local**	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	**Moderate**	Moderate change to Heritage Resource with Medium - Medium High Value	**Unlikely / Low probability**	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.			
	Probability	**Description**	**Exposure**	**Description**	**Intensity**	**Description**	**Probability**	**Description**
2	**Short Term**	Impact will remain for <10% of Project Life	**Limited**	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site-specific study area.	**Low**	Minor change to Heritage Resource with Medium - Medium High Value	**Rare / Improbable**	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	**Transient**	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	**Very Limited**	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	**Very low**	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	**Highly Unlikely /None**	Expected never to happen. Impact will not occur.

Table 3-2: Impact Significance Scores, Descriptions and Ratings

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Table 3-3 Relationship between Consequence, Probability and Significance

Relationship between consequence, probability and significance ratings

Significance

Probability	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Consequence

4 Recommended Management and Mitigation Measures

The CS of an identified heritage resource informs the level of the identified potential impact to that resource which in turn informs the recommended management and mitigation requirements. Table 4-1 presents an overview of the minimum recommended mitigation requirements considering the CS of the heritage resource.

Table 4-1: Minimum Recommended Management or Mitigation Requirements Considering CS

Determined CS	Minimum Management / Mitigation Requirements[4]
Negligible	Sufficiently recorded through assessment, no mitigation required
Low	Resource must be recorded before destruction, may include detailed mapping or surface sampling
Medium	Mitigation of the resource to include detailed recording and limited test excavations
Medium-High	Project design must aim to minimise impacts; Mitigation of resources to include extensive sampling through test excavations and analysis
High	Project design must aim to avoid impacts; Cultural heritage resource to be partially conserved, must be managed by way of Conservation Management Plan
Very High	Project design must be amended to avoid all impacts; Cultural heritage resources to be conserved in entirety and conserved and managed by way of Conservation Management Plan

The desired outcome of an impact assessment is the avoidance of all negative impacts and enhancement of positive ones. While this is not always possible, the recommended management or mitigation measures must be reasonable and feasible taking into consideration the determined CS and nature of the Project.

Two categories of impact management options are considered: avoidance and mitigation.

Avoidance requires changes or amendments to Project design, planning and siting of infrastructure to avoid physical impacts on heritage resources. It is the preferred option, especially where cultural heritage resources with high – very-high CS will be impacted.

[4] Based on minimum requirements encapsulated in guidelines developed by SAHRA

Mitigation of cultural heritage resources may be necessary where avoidance is not possible, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be protected until they are fully recorded, documented and researched before any negative impact occurs. Options for mitigating a negative impact can include minimization, offsets, and compensation. Examples of mitigation measures specific to cultural heritage include:

- Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – "preservation by record"; and
- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is normally a regulated permitted activity for which permits[5] need to be issued by the Heritage Resource Authorities (HRAs). Such mitigation may result in a reassessment of the value of a cultural heritage resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled.

Where resources have negligible CS, the specialist may recommend that no further mitigation is required, and the site may be destroyed where authorised.

Community consultation is an integral activity to all above-mentioned avoidance and mitigation measures.

[5] Permit application processes must comply with the relevant Section of the NHRA and applicable Chapter(s) of the NHRA Regulations, 2000 (Government Notice Regulation [GN R] 548) and must be issued by SAHRA or the Provincial Heritage Resources Authority (PHRA) as is applicable.