



# DIGBY WELLS

## ENVIRONMENTAL

**SAHRIS Case ID:** 11478  
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## Environmental Regulatory Processes relating to the amendment of the Environmental Management Programme for its Elandsfontein Operations

## Heritage Impact Assessment

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**Project Number:**

ANK3784

**Prepared for:**

Elandsfontein Colliery (Pty) Ltd

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## DECLARATION OF INDEPENDENCE

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I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Anker Coal and Mineral Holdings SA (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Heritage Resources Management (HRM) Process for the Section 102 Environmental Management Programme Amendment of the Elandsfontein Colliery, located near Clewer, Mpumalanga Province.

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## GLOSSARY

Term	Definition
<b>Alter</b>	Any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.
<b>Archaeological</b>	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. 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.
<b>Archaeologist</b>	A trained professional who uses scientific methods to excavate record and study archaeological sites and deposits.
<b>Artefact</b>	Any object manufactured or modified by human beings.
<b>Ceramic (syn. pottery)</b>	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, etc.
<b>Ceramic facies / facies</b>	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.
<b>Ceramic tradition</b>	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
<b>Ceramic classification</b>	<p>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. Huffman (1970) postulated that the migration of farming communities could be recognised via a technique of ‘ceramic seriation’. Ceramic seriation is based on the premise that certain styles of ceramics, including vessel shape and decorative motifs, follow each other chronologically, and can be attributed to certain archaeological ‘cultures’ (Huffman, 1970; 1980).</p> <p>Huffman (1970) and Phillipson (1977) demonstrated that Bantu-speaking groups may have migrated southwards in three ‘streams’ from a possible central homeland, over different periods (See Figure 6 4). These streams are generally associated with diverse Eastern Bantu-speaking societies and various farming community periods. Although these hypotheses have since undergone meaningful reviews and received significant opposition, a general consensus remains that ceramic seriation can be used to reconstruct population movements.</p>
<b>Compulsory repair order</b>	<p>A heritage resources authority may serve on the owner of a heritage site an order to repair or maintain such site, to the satisfaction of the heritage resources authority, within a reasonable period of time as specified in the order where the heritage resources authority considers that such site:</p> <ul style="list-style-type: none"> <li>▪ Has been allowed to fall into disrepair for the purpose of effecting or enabling its destruction or demolition, enabling the development of the designated land, or enabling the development of any land adjoining the designated land.</li> <li>▪ Is neglected to such an extent that it will lose its potential for conservation.</li> </ul>
<b>Conservation</b>	<p>In relation to heritage resources includes the protection, maintenance, preservation and sustainable use of places or objects so as to safeguard their cultural significance.</p>



Term	Definition
<b>Cultural significance (CS)</b>	<p>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:</p> <ul style="list-style-type: none"> <li>▪ Importance in the community, or pattern of South Africa's history.</li> <li>▪ Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage</li> <li>▪ Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.</li> <li>▪ Importance in demonstrating the principal characteristic of a particular class of South African's natural or cultural places or objects.</li> <li>▪ Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.</li> <li>▪ Importance in demonstrating a high degree of creative or technical achievement at a particular period.</li> <li>▪ Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.</li> <li>▪ Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.</li> <li>▪ Significance relating to the history of slavery in South Africa.</li> </ul>
<b>Development</b>	<p>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:</p> <ul style="list-style-type: none"> <li>▪ Construction, alteration, demolition, removal or change of use of a place or a structure at a place.</li> <li>▪ Carrying out any works on or over or under a place.</li> <li>▪ Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place.</li> <li>▪ Constructing or putting up for display signs or hoardings.</li> <li>▪ Any change to the natural or existing condition or topography of land.</li> <li>▪ Any removal or destruction of trees, or removal of vegetation or topsoil.</li> </ul>
<b>Early Farming Community/ies</b>	<p>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.</p>



Term	Definition
<b>Early Stone Age</b>	The South African ESA dates from ~3 Mya to c. 250 Kya. This period is associated with later <i>Australopithecus</i> and early <i>Homo</i> species. The lithic industries that characterise the ESA include Oldowan and Early Acheulian, typically as simple core tools, choppers handaxes and cleavers.
<b>Excavation</b>	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.
<b>Farming Community/ies</b>	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 <i>Iron Age</i> 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.
<b>Field Rating</b>	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: <ul style="list-style-type: none"> <li>▪ Grade I: Heritage resources with qualities so exceptional that they are of special national significance.</li> <li>▪ 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.</li> <li>▪ Grade III: Other heritage resources worthy of conservation.</li> <li>▪ General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.</li> </ul>
<b>General protection</b>	General protections are afforded to: <ul style="list-style-type: none"> <li>▪ Objects protected in terms of laws of foreign states.</li> <li>▪ Structures older than 60 years.</li> <li>▪ Archaeological and palaeontological sites and material and meteorites.</li> <li>▪ Burial grounds and graves.</li> <li>▪ Public monuments and memorials.</li> </ul>
<b>Grave</b>	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.



Term	Definition
<b>Heritage Impact Assessment (HIA)</b>	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 clearly outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
<b>Heritage resource</b>	Any place or object of cultural significance.
<b>Heritage resources management</b>	<p>Process required when development is intended categorised as:</p> <ul style="list-style-type: none"> <li>▪ Any linear development exceeding 300m in length.</li> <li>▪ Construction of a bridge or similar structure exceeding 50 m in length.</li> <li>▪ 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.</li> <li>▪ Re-zoning of a site exceeding one hectare in extent.</li> <li>▪ Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.</li> </ul>
<b>Heritage site</b>	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 resources authority.
<b>Late Farming Community/ies</b>	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.
<b>Late Stone Age</b>	The South African LSA dates from ~30 Kya. This period is associated with modern <i>Homo sapiens sapiens</i> 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 cryptocrystalline, quartz and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.



Term	Definition
<b>Living / intangible heritage</b>	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.
<b>Management</b>	In relation to heritage resources, includes the conservation, presentation and improvement of a place protected in terms of the NHRA.
<b>Middle Stone Age</b>	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 <i>Homo sapiens species</i> . 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.
<b>National estate</b>	<p>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:</p> <ul style="list-style-type: none"> <li>▪ Places, buildings, structures and equipment of cultural significance.</li> <li>▪ Places to which oral traditions are attached or which are associated with living heritage.</li> <li>▪ Historical settlements and townscapes.</li> <li>▪ Landscapes and natural features of cultural significance.</li> <li>▪ Geological sites of scientific or cultural importance.</li> <li>▪ Archaeological and palaeontological sites.</li> <li>▪ 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 (Act No. 61 of 2003).</li> <li>▪ Sites of significance relating to the history of slavery in South Africa.</li> <li>▪ 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.</li> <li>▪ Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings,</li> </ul>



Term	Definition
	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).
<b>Object</b>	Any movable property of cultural significance which may be protected in terms of any provisions of this Act, including: any archaeological artefact; palaeontological and rare geological specimens; meteorites; and other objects referred to in Section 3 of the NHRA.
<b>Pedestrian survey</b>	A method of examining a site in which surveyors, spaced at regular intervals, systematically walk over the area being investigated.
<b>Phase 1 Archaeological Impact Assessment (AIA)</b>	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.
<b>Phase 2 Archaeological Impact Assessment (AIA)</b>	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.
<b>Phase 3 Management Plan / Conservation Management Plan (CMP)</b>	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).





<b>Term</b>	<b>Definition</b>
<b>Place</b>	A place includes: a site, area or region; a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure; a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures; an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.
<b>Pre-disturbance survey (syn. reconnaissance)</b>	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.
<b>Presentation</b>	In relation to a heritage resource, site or place includes: the exhibition or display of; the provision of access and guidance to; the provision, publication or display of information in relation to; and performances or oral presentations related to, heritage resources protected in terms of the NHRA.
<b>Provisional protection</b>	A protected area or heritage resource provisionally protected by SAHRA or a provincial heritage resources authority by a notice in the Gazette or Provincial Gazette.
<b>Reconnaissance</b>	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).
<b>Site</b>	Any area of land, including land covered by water, and including any structures or objects thereon.
<b>Stop work order</b>	An order served on a person by the Minister on advice of SAHRA or MEC to immediately cease all work in and around a heritage site for a period not exceeding 10 years. The order attaches to land is binding on the current owner and any future owner.
<b>Structure</b>	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.
<b>Tangible heritage</b>	Physical heritage resources such as archaeological sites, historical buildings, burial grounds and graves, fossils, etc. 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.

## EXECUTIVE SUMMARY

Anker Coal and Mineral Holdings SA (Pty) Ltd (hereinafter Anker Coal) appointed Digby Wells Environmental (hereinafter Digby Wells) to complete an integrated Section 102 amendment of their approved Elandsfontein Operations Environmental Management Programme (EMPr) (*"the Project"*).

The Elandsfontein Colliery consisted of underground (314MR) and open-pit sections (63MR). As this is an existing operation, all the necessary infrastructure is in place and no additional infrastructure is proposed as part of the amendment process. The only new operational activity is the extraction of the No. 2 coal seam via open-pit strip mining within the 314MR area as the quality of the resource is such that it will be sold to Eskom's Primary Energy Division for the generation of electricity at various power stations. Open pit operations commenced in October 2016 on mineral area 5 of 63MR through pre-stripping of waste material to expose the No. 2 seam. Full production capacity was anticipated during January 2017, aimed at between 50 000 to 60 000 tonne Run of Mine (RoM).

A review of the existing EMPr and the South African Heritage Resources Information System (SAHRIS) did not yield any proof of a completed HIA for the Elandsfontein Operation required in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The South African regulatory framework makes provision for assessment of potential impacts to heritage resources and the cultural landscape. This report constitutes the Heritage Impact Assessment (HIA) to inform the Environmental Impact Assessment (EIA) and EMPr.

A total of five heritage resources were identified within the site-specific study area. The identified sites and the Cultural Significance rating of these resources are summarised as follows:

Site Name	Latitude	Longitude
11478/BGG-001	-25.908662	29.083866
11478f/BGG-002	-25.909298	29.085263
11478/BGG-003	-25.912401	29.090872
11478/BGG-004 (10260/nearLDTP21)	-25.910433	29.107089
11478/BGG-005 (10260/nearLDTP45) (9060/Feature5)	-25.911806	29.11055

Resource ID	Aesthetic	Historic	Scientific	Social	Integrity	Value	Designation	Recommended Field Rating
Burial grounds and graves	-	-	-	5	4	20	Very High	Grade I

Through Digby Wells' understanding of the Project and the project related activities, the following potential impacts were identified and assessed:

Project Activity	Impact Type	Impact Description	Management Objectives	Actions and Targets
Construction: Removal of topsoil and overburden.	Direct Negative Impact	Destruction of BGG-002 resulting in permanent changes to the physical and intangible integrity of the resource.	Avoid negative impacts through project related mitigation measures.	Project design must be amended to remove all negative impacts and conserve the resource in its entirety. A Conservation Management Plan (CMP) must be developed for all burial grounds and graves within the site-specific study area
Operation: Mining of coal		Loss of intangible integrity or degradation of intrinsic CS of burial grounds and graves through restricted access to Next-of-Kin (NoK).	Where project related mitigation measures are not feasible, reduce the intensity of negative impacts through heritage related mitigation measures.	

To mitigate the identified potential impacts to the burial grounds and graves, the following recommendations must be considered by the proponent:

- Project related mitigation includes the exclusion<sup>1</sup> of the planned open pit mining areas for Year 0 and the southern portion for Year 1 construction and operational

<sup>1</sup> The author acknowledges that the location of the open pit areas is restricted by the distribution of the coal resources. While this mitigation may be determined to be unfeasible, the proponent must consider project related mitigation measures to remove identified negative impacts to heritage resources.

phases to conserve the burial ground BGG-002 *in situ*, and reduce the intensity of potential impacts to BGG-001 and BGG-003;

- All burial grounds and graves within the site-specific study area must be subject to a BGGC Process to identify *bona fide* NoK, reach agreement on access to and management of the sites, and formalise agreements in a CMP. The CMP must at a minimum:
  - Identify, accurately map, mark, number and photograph all burial grounds and graves within the site-specific study area;
  - Assess current status of and damage to surface dressing caused through previous operational activities;
  - Include Standard Operating Procedures for:
    - a) Controlled access to burial grounds and graves by NoK; and
    - b) Roles and responsibility matrix for maintenance of burial grounds and where required, repairs to / replacement of surface dressings;
  - Define conditions for project specific management and monitoring protocols;
  - Establish a monitoring process and schedule;
  - Include a grievance mechanism to record any grievances received from NoK or other relevant parties;
  - Define a GRP framework for where burial grounds and graves are under immediate and direct threat; and
- Where the proposed recommendations are not feasible, a GRP as regulated by Section 36 of the NHRA and Chapters XI and IX of the Regulations to the Act (GN R 548), and supported by the aforementioned BGGC process and CMP must be completed.

*In lieu* of the recommended CMP, the following immediate management measures must be completed to safeguard against possible negative impacts to the sites BGG-001, BGG-002 and BGG-003 specifically:

1. The burial grounds and graves must be clearly demarcated to demonstrate the extent of the burial grounds;
2. The burial grounds and graves must be fenced with an access gate to allow for unrestricted access to NoK;
3. The burial grounds and graves must be accurately mapped, marked, numbered and photographed for record, monitoring and management purposes;
4. The burial grounds and graves must be plotted against the mines working plan;
5. A minimum buffer of 50 m surrounding the burial grounds and graves must be established and maintained, within which no mining activities may be performed;
6. The burial grounds and graves must be maintained by the mine through vegetation control and site cleaning on a regular basis.



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## 1 Introduction

Anker Coal and Mineral Holdings SA (Pty) Ltd (hereinafter Anker Coal) appointed Digby Wells Environmental (hereinafter Digby Wells) to complete an integrated Section 102 amendment of their approved Elandsfontein Operations Environmental Management Programme (EMPr) ("*the Project*"). Digby Wells completed the Project in terms of Section 102 of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

This report constitutes the Heritage Impact Assessment (HIA) to inform the EIA and EMPr completed in terms of the MPRDA and Section 24 of the National Environmental Management Act, 1999 (Act No. 107 of 1999) (NEMA)<sup>2</sup>.

### 1.1 Project Background

Fraser Alexander established the Elandsfontein Colliery during the early 1980s. During this period, there were no legislative requirements for the application of a Mining Licence or Right in terms of the national regulatory framework as the Mining Rights Act of 1967 did not apply to base minerals. All mining activities during this period, up to the promulgation of the Minerals Act, 1991 (Act No. 51 of 1991) (*Minerals Act*), were unregulated particularly as far as environmental measures were concerned. Subsequent to the declaring the Minerals Act the government required the owners of mines to obtain authorisations and prepare an EMPr for their operation.

Fraser Alexander sold the Elandsfontein Colliery to Anker Coal in 1997. The Department of Mineral Resources (DMR) approved the Elandsfontein Operations EMPr in terms of the Minerals Act, 1991 (Act No. 51 of 1991) on 11 October 1999. Subsequent to this authorisation, the DMR issued two new order mining rights for various portions of the farm Elandsfontein 309 JS. This comprised MP314MR and MP63MR. The mining right 314 MR is due for expiration in May 2017, therefore necessitating an application for renewal in terms of Section 24 of the MPRDA. Furthermore, Anker Coal must amend the approved EMPr to reflect various operational changes at the mine.

A review of the existing EMPr and the South African Heritage Resources Information System (SAHRIS) did not yield any proof of a completed HIA for the Elandsfontein Operation required in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). The South African regulatory framework makes provision for assessment of potential impacts to heritage resources and the cultural landscape in the MPRDA, NEMA, NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (GN R 982), National

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<sup>2</sup> The reader must note that as the existing mining operation has approvals under the new order mining right (314MR), with the EMPr approved under the Minerals Act. Digby Wells assumes that the activities occurring at the Mine are "Listed Activities" in terms of the Environmental Impact Assessment (EIA) Regulations of 2014. Digby Wells further assumes these are existing lawful activities and that no applications in terms of the NEMA will be required.



Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and NHRA Regulations (GN R 548).

To this effect, Anker Coal enlisted the services of Digby Wells to undertake a consolidated Heritage Resources Management (HRM) process for the Elandsfontein Operation to promote compliance with the national legislative framework presented in Section 2 below.

## 1.2 Project Description

The Elandsfontein Colliery consisted of underground (314MR) and open-pit sections (63MR). As this is an existing operation, all the necessary infrastructure is in place and no additional infrastructure is proposed as part of the amendment process. The only new operational activity is the extraction of the No. 2 coal seam via open-pit strip mining within the 314MR area as the quality of the resource is such that it will be sold to Eskom's Primary Energy Division for the generation of electricity at various power stations<sup>3</sup>. Open pit operations commenced in October 2016 on mineral area 5 of 63MR through pre-stripping of waste material to expose the No. 2 seam. Full production capacity was anticipated during January 2017, aimed at between 50 000 to 60 000 tonne Run of Mine (RoM).

The mining method employed is roll over strip mining concurrent with rehabilitation. The exposed No. 2 seam will be mined by truck and shovel operations and placed on the RoM stock pile for dry processing. Drilling and blasting operations will form a critical part of mining method. Both material horizons will be drilled at specific patterns and blasted with the use of emulsion and pyrotechnics (shocktube). Waste material will be placed on dumps in support of a continuous roll over method where waste material will be placed in previous mined out cut.

To continue with the aforementioned mining of the No. 2 coal seam, Anker Coal wishes to extend its mining right 314 MR expiring in 2017. To obtain the required extension, Anker Coal must update their Mine Works Programme (MWP), Social and Labour Plan (SLP), and EMPr to reflect various operational changes.

## 1.3 Project Location

The Project is located between Ogies and eMalahleni in the eMalahleni Local Municipality (ELM), Mpumalanga Province.

The area is predominantly characterised by mining activities, urban settlements, farmsteads, intensive agriculture and grazing.

Table 1-1 presents a summary of the Project location detail.

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<sup>3</sup> It is important to note that coal is currently being sold to Eskom and that it is essential that these sales continue without interruption to allow ongoing rehabilitation of the mined-out areas.

**Table 1-1: Project Location Summary**

<b>Province</b>	Mpumalanga
<b>Magisterial District</b>	Witbank Magisterial District (WMD)
<b>District Municipality</b>	Nkangala District Municipality (NDM)
<b>Local Municipality</b>	eMalahleni Local Municipality (ELM)
<b>Nearest town</b>	Clewer / eMalahleni / Ogies
<b>Property</b>	Elandsfontein 309 JS
<b>Location</b>	Off Apex Road, Clewer.
<b>1:50 000 topographical map</b>	2629CC
<b>Relative centre coordinates of project area</b>	South: 25° 54' 37.689" S East: 29° 5' 18.120" E
<b>Extent of properties</b>	314 MR = 592 ha 63 MR = 237.7 ha
<b>Commodity</b>	Coal
<b>Predominant land use/s of surrounding properties</b>	Settlement, Agriculture, Mining
<b>Rezoning requirements</b>	The project area will not require rezoning

## 1.4 Terms of Reference

The approved Terms of Reference (ToR) were to promote compliance with the national legislative framework through completing a HRM process in terms of Section 38(8) of the NHRA for the Elandsfontein Operations, including both the 314 MR and 63 MR.

## 1.5 Scope of Work

The Scope of Work (SoW) that was completed for the HIA to comply with Section 38(3) of the NHRA and the ToR included:

- Identification and mapping (*as far as feasible*) of all heritage resources<sup>4</sup> in the proposed development footprint;
- Assessment of Cultural Significance (CS) of identified heritage resources;
- Identification of potential impacts to heritage resources based on Project activities;

<sup>4</sup> The reader must consider that mining activities prior to the approved EMPr were not regulated. It is therefore assumed that mining operations have disturbed and impacted upon the mining area in so far that any heritage resources that may have existed, with the exception of known burial grounds and graves, have been removed.



- An evaluation of the impact of the operation on heritage resources relative to the sustainable socio-economic benefits that may be derived from the Project;
- Present the results of consultation with Interested and Affected Parties (I&APs) and/or stakeholders;
- Consideration of project alternatives;
- Recommend feasible management or mitigation measures to avoid and/or reduce negative impacts and enhance positive ones; and
- Submission of the HIA report to the SAHRA and PHRA-G for Statutory Comment as required under Section 38(8) of the NHRA.

## 1.6 Expertise of the Specialist

The expertise of the HRM specialist is presented in Table 1-2:

**Table 1-2: Expertise of the Specialist**

Team Member	Bio Sketch
Justin du Piesanie  ASAPA Member 270 AMAFA Registered ICOMOS Member 14274  Years' Experience: 11	Justin is the HRM Manager at Digby Wells. Justin joined the company in August 2011 as an archaeologist and was subsequently made the HRM manager in the Social and Heritage Services Department. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, Justin has acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. Justin's current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.



## 1.7 Structure of the Report

The remainder of the report is structured as follows:

Chapter	Description
2	Outlines the relevant legal framework considered in the compilation of this assessment.
3	Identifies the specific constraints and limitations experienced in the compilation of this HIA
4	Describes the methodology employed in the data collection and impact assessment.
5	Provides a cultural heritage baseline for the defined study areas to provide the reader with contextual information.
6	Outlines identified impacts and assesses the intensity of predicted heritage impacts
7	Categorises cumulative impacts on the cultural landscape that may manifest due to various existing and proposed developments in the local study area.
8	Highlights potential unplanned events and low risks that may manifest as potential future impacts.
9	Examines identified heritage impacts against the sustainable socio-economic benefits of the Project.
10	Describes the current status of the consultation process for this Project.
11	Collates the most salient points of the heritage assessment and concludes with the specific outcomes and recommendations of the study.
12	Lists the source material used in the development of the report.

## 2 Legislative and Policy Framework

The HRM process is governed by the national legislative framework. This section provides a brief summary of the relevant legislation pertaining to the conservation and responsible management of heritage resources.

**Table 2-1: Applicable Legislation considered in the HRM Process**

Applicable legislation used to compile the report	Reference where applied
<p><b><u>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</u></b></p> <p>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 –</p> <p>i. Prevent pollution and ecological</p>	<p>The HRM process is being undertaken to identify heritage resources and determine heritage impacts associated with the project.</p> <p>As part of the HRM process, mitigation measures and monitoring plans will be recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.</p>





Applicable legislation used to compile the report	Reference where applied
degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	
<p><b><u>Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002)</u></b></p> <p>The MPRDA sets out the requirements relating to the development of the nation's mineral and petroleum resources. It also aims to ensure the promotion of economic and social development through exploration and mining-related activities.</p> <p>The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive SLP to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.</p> <p>Section 102 of this Act applies in respect of proposed amendments to the existing mining rights. A Section 102 Amendment does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application. However, a Section 102 Amendment does require an EA application to be completed which entails a BAR or EIA to be conducted.</p> <p>The EIA or BAR must therefore be conducted in accordance with Section 39 of the MPRDA that give effect to the general objectives of integrated environmental management encapsulated in Chapter 5 of the NEMA. The EIA must furthermore speak to impacts that the mining will have on the environment in accordance with section 24(7) of the NEMA.</p>	<p>This HIA, which relates specifically to the Elandsfontein Colliery Section 102 amendment, has been compiled in accordance with the MPRDA read with the EIA Regulations, 2014.</p>
<p><b><u>National Environmental Management Act, 1998 (Act No. 107 of 1998)</u></b></p> <p>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</p>	<p>The EIA process is being undertaken in accordance with the principles of Section 2 of NEMA as well as with the EIA Regulations, 2014, promulgated in terms of NEMA.</p> <p>Digby Wells assumes existing activities are lawful in terms of the EIA Regulations, 2014 and</p>



Applicable legislation used to compile the report	Reference where applied
<p>adhered to, to inform decision making on issues affecting the environment. Section 24 (1)(a), (b) and (c) of NEMA state that:</p> <p><i>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.</i></p> <p>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.</p>	<p>that no applications in terms of the NEMA will be required.</p>
<p><b><u>GN R. 982: Environmental Impact Assessment Regulations, 2014</u></b></p> <p>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:</p> <ul style="list-style-type: none"> <li>▪ Regulation GN R. 983 - Listing Notice 1: This listing notice provides a list of various activities that require environmental authorisation and that must follow a basic assessment process.</li> <li>▪ Regulation GN R. 984 – Listing Notice 2: This listing notice provides a list of various activities that require environmental authorisation and that must follow an environmental impact assessment process.</li> <li>▪ Regulation GN R. 985 – Listing Notice 3: This notice provides a list of various environmental activities that have been identified by provincial governmental</li> </ul>	<p>Digby Wells assumes existing activities are lawful in terms of the EIA 2014 regulations and that no applications in terms of the NEMA will be required.</p>



Applicable legislation used to compile the report	Reference where applied
<p>bodies that if undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed.</p>	
<p><b><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></b></p> <p>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:</p> <ul style="list-style-type: none"> <li>▪ 5. General principles for HRM;</li> <li>▪ 6. Principles for management of heritage resources;</li> <li>▪ 7. Heritage assessment criteria and grading; and</li> <li>▪ 38. Heritage resources management.</li> </ul> <p>The Act requires that Heritage Resources Authorities (HRAs), in this case the South African Heritage Resources Agency (SAHRA) and the Mpumalanga Provincial Heritage Resources Authority (MPRHA), 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.</p>	<p>A Notice of Intent to Develop (NID) will be submitted, as part of this HIA, to the SAHRA and MPHRA. The HIA was compiled to comply with subsection 3(3)(a) and (b) of the NHRA.</p>

**Table 2-2: Applicable Policies considered in the HRM Process**

Applicable policies used to compile the report	Reference where applied
<p><u>South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007)</u></p> <p>The Minimum Standards provide the minimum standards that must be adhered to for the compilation of a HIA Report.</p> <p>Chapter II Section 7 outlines the minimum</p>	<p>The HIA was compiled to adhere to the minimum standards as defined by Chapter II of the SAHRA APM Guidelines (2007)</p>



Applicable policies used to compile the report	Reference where applied
<p>requirements for inclusion in the heritage assessment as follows:</p> <ul style="list-style-type: none"> <li>▪ Background information on the Project;</li> <li>▪ Background information on the cultural baseline;</li> <li>▪ Description of the properties or affected environs;</li> <li>▪ Description of identified sites or resources;</li> <li>▪ Recommended field rating of the identified sites to comply with Section 38 of the NHRA;</li> <li>▪ A statement of Cultural Significance in terms of Section 3(3) of the NHRA; and</li> <li>▪ Recommendations for mitigation or management of identified heritage resources.</li> </ul>	

### 3 Constraints and Limitations

The following constraints and limitations influenced this assessment:

- Available historical aerial imagery for the site-specific study area is under 60 years: the existence of historic structures generally protected under Section 34 of the NHRA could therefore not be determined;
- The site-specific study area was not previously subject to heritage assessment given that the original operations and mining approvals predated the current mining, environmental and heritage legislation. Any heritage resources that may have existed within the site-specific study area are therefore unknown and not considered in this assessment; and
- The inherent nature of many heritage resources, i.e. occurring at sub-surface levels with no or limited trace evidence on the surface, highlights the potential of subsurface occurrences. To investigate these occurrences, permits regulated under Section 35 of the NHRA are required. No permits were held by the specialists, and as such, it is possible that archaeological sites may be identified during the operational phase of the project.

### 4 Methodology

The HIA provides a brief Project background and cultural heritage baseline to contextualise the defined Cultural Significance (CS), assigned Field Ratings, and potential heritage risk and impacts identified. This information further enables the relevant heritage authorities to specify any restrictions or additional requirements for inclusion in the EMPr. This section

describes the activities used to develop the cultural heritage baseline profile, CS, Field Ratings and impact assessment.

## 4.1 Defining Study Area

Heritage resources do not exist in isolation to the greater natural and social (including socio-cultural, -economic and -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. Four 'concentric' study areas were defined for the purposes of this study. The four defined study areas included the following:

- The *development footprint* area – the immediate boundaries of the proposed infrastructure, i.e. planned expansion according to the Elandsfontein Colliery MWP. The area where direct impacts to heritage resources are most probable;
- The *site-specific* study area – the extent of the farm portions associated with the proposed project including a 500 m buffer area. The site-specific study area may extend linearly. In such instances, the defined site-specific study area includes the linear development, e.g. a road, and a 200 m buffer either side of the development 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 immediate surrounding properties / farms, as well as the affected local municipality. 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 – defined as the area bounded by the district municipal demarcation. Where necessary, the regional study area was 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.

## 4.2 Data Collection

### 4.2.1 Primary Data Collection

Primary data was collected by Justin du Piesanie through a field survey of the Project area and proposed pit expansions on 29 November 2016. The survey was non-intrusive (i.e. no sampling was undertaken) with the objectives to:

- Visually record the current state of the cultural landscape; and

- Ground truth certain heritage resources and sites known to occur within the Project area.

The field survey showed that landscape has been significantly altered through anthropogenic activities. These primarily include historic mining operations associated with the Elandsfontein Colliery, and historic intensive agricultural activities prior to the development of the colliery during the 1980s.

Identified heritage resources were recorded as waypoints using handheld GPS and documented through written and photographic records. The actual survey was recorded as track logs.

#### 4.2.2 Secondary Data Collection

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

A survey of diverse information repositories was made to identify appropriate relevant information sources. These sources were analysed for credibility and relevance. Credible, relevant sources were then critically reviewed. The objectives of the literature review were to:

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

Repositories that were surveyed included the SAHRIS, online / electronic journals and platforms, and certain internet sources. This HIA only includes a summary and discussion of the most relevant findings. Relevant sources were cited and included in the literature review's reference list.

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information System (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 / absence of visible features; and
- Identifies potential locations where heritage resources may exist within an area.




**Table 4-1: Qualitative Data Sources**

Reviewed Qualitative Data		
Databases		
University of the Witwatersrand (Wits) Archaeological Database (2010)	Genealogical Society of South Africa (GSSA)	SAHRIS
SAHRIS Cases		
Case ID 138	Case ID 4919	Case ID 9893
Case ID 165	Case ID 4993	Case ID 9978
Case ID 166	Case ID 5472	Case ID 10260
Case ID 174	Case ID 5506	Map ID 581
Case ID 466	Case ID 5621	Map ID 648
Case ID 613	Case ID 5763	Map ID 654
Case ID 756	Case ID 5836	Map ID 659
Case ID 846	Case ID 5863	Map ID 662
Case ID 882	Case ID 5914	Map ID 672
Case ID 906	Case ID 5977	Map ID 687
Case ID 950	Case ID 6251	Map ID 710
Case ID 1115	Case ID 6299	Map ID 711
Case ID 1144	Case ID 6357	Map ID 719
Case ID 1297	Case ID 6392	Map ID 1025
Case ID 1487	Case ID 6492	Map ID 1121
Case ID 1722	Case ID 6508	Map ID 1147
Case ID 1724	Case ID 6568	Map ID 1153
Case ID 1775	Case ID 6810	Map ID 1153
Case ID 1803	Case ID 6944	Map ID 1164
Case ID 2043	Case ID 7171	Map ID 1164
Case ID 2078	Case ID 7181	Map ID 1165
Case ID 2082	Case ID 7272	Map ID 1179
Case ID 2261	Case ID 7276	Map ID 1236
Case ID 2571	Case ID 7332	Map ID 1645
Case ID 2574	Case ID 7359	Map ID 1649
Case ID 2702	Case ID 7364	Map ID 1668
Case ID 2736	Case ID 7557	Map ID 1718
Case ID 3020	Case ID 7601	Map ID 2081
Case ID 3135	Case ID 7721	Map ID 2179
Case ID 3545	Case ID 7919	Map ID 2179



Reviewed Qualitative Data		
Case ID 3603	Case ID 7923	Map ID 2269
Case ID 3745	Case ID 8410	Map ID 2339
Case ID 3818	Case ID 8481	Map ID 2418
Case ID 3907	Case ID 8771	Map ID 2859
Case ID 4225	Case ID 8953	Map ID 2895
Case ID 4249	Case ID 9060	Map ID 2901
Case ID 4309	Case ID 9150	Map ID 2907
Case ID 4547	Case ID 9651	Map ID 3004
Case ID 4774	Case ID 9719	
Cited Text		
Bamford, 2012	Cloete, 2000	Johnson, Van Vuuren, Hegenberger, Key, & Shoko, 1996
Bamford, 2014a	Delius & Cope, 2007	Johnson, et al., 2006
Bamford, 2014b	Delius, Maggs, & Schoeman, 2014	Pelser, Van Schalkwyk, Teichert, & Masiteng, 2006
Bamford, 2016	Falconer, 1990	Swanepoel, Esterhuysen, & Bonner, 2008
Cadman, 2007	Garstang, Coleman, & Therrell, 2014	Von der Hyde, 2013

### 4.3 Site Naming Convention

Heritage resources identified by Digby Wells during the field survey were prefixed by the SAHRIS case identification generated for this Project. Information on the relevant period / feature code and site number followed (e.g. 11478/BGG-001). This number may be shortened on plans or figures to the period / feature code and site number (e.g. BGG-001).

Heritage resources identified through secondary data collection were prefixed by the relevant SAHRIS case or map identification (*where applicable*), and the original site name used by the author (e.g. 138/Site1).

### 4.4 Developing Cultural Significance and Field Ratings

#### 4.4.1 Cultural Significance

CS was determined based on identified resources' importance or contribution to four broad value categories: aesthetic, historical, scientific and social values. These categories summarised the CS and other values described in Section 3(3) of the NHRA. The resources' importance or contributions to these values were considered in terms of associative (qualitative) and / or rarity (quantitative) attributes, based on collected secondary data.

The integrity or condition of resources further influenced the CS. Integrity is largely determined based on resources' current, observed state of conservation, as well as notable changes made to it over the years.

#### 4.4.2 Field Ratings

Field ratings assist the responsible heritage resources authority to grade heritage resources into national (Grade I), provincial (Grade II) or local (Grade III) categories, and are required under Chapter II Section 7(J) of the SAHRA Minimum Standards.

Field ratings considered the assigned CS and the level of official management required or the local competency of heritage authorities<sup>5</sup>.

#### 4.5 Defining Heritage Impacts

Project activities can impact on heritage resources in a number of ways. For instance, although identified heritage resources may not be physically (i.e. directly) affected by project activities, the same activities could impact on the intangible nature of heritage resources.

An example that best illustrates the complexity of heritage impacts is where burial grounds occur within the site-specific project area, but will not be physically affected by any project activities. Access to such sites by descendants of the deceased or other parties may be restricted or lost; the intangible heritage associated with graves as places of memory, ritual, identity, etc., can therefore be impacted without actual, physical impact on the sites. Such impacts may manifest in social repercussions.

Heritage impacts are further compounded when the intensity of predicted impacts and the assigned CS of heritage resources differ significantly. Again, burial grounds are the best example. These resources are generally considered to be of very high CS; even low ranked impacts may therefore be detrimental to their tangible and intangible conservation.

Predicted heritage impacts were therefore placed into the following three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** that could change the fabric or physical integrity of heritage resources: 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 if the CS of sites are not considered;
- **Indirect, induced or secondary heritage impacts** that can change the fabric or intangible quality of heritage resources later in time or at a different place from the causal activity (e.g. descendants of deceased), or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion

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<sup>5</sup> Currently the MPHRA is only competent to manage and issue permits on NHRA Section 34 heritage resources, and no local (i.e. local government) competency exists within the province. All decisions relating to archaeology, palaeontology and burial grounds and graves therefore fall under the ambit of SAHRA.



of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.

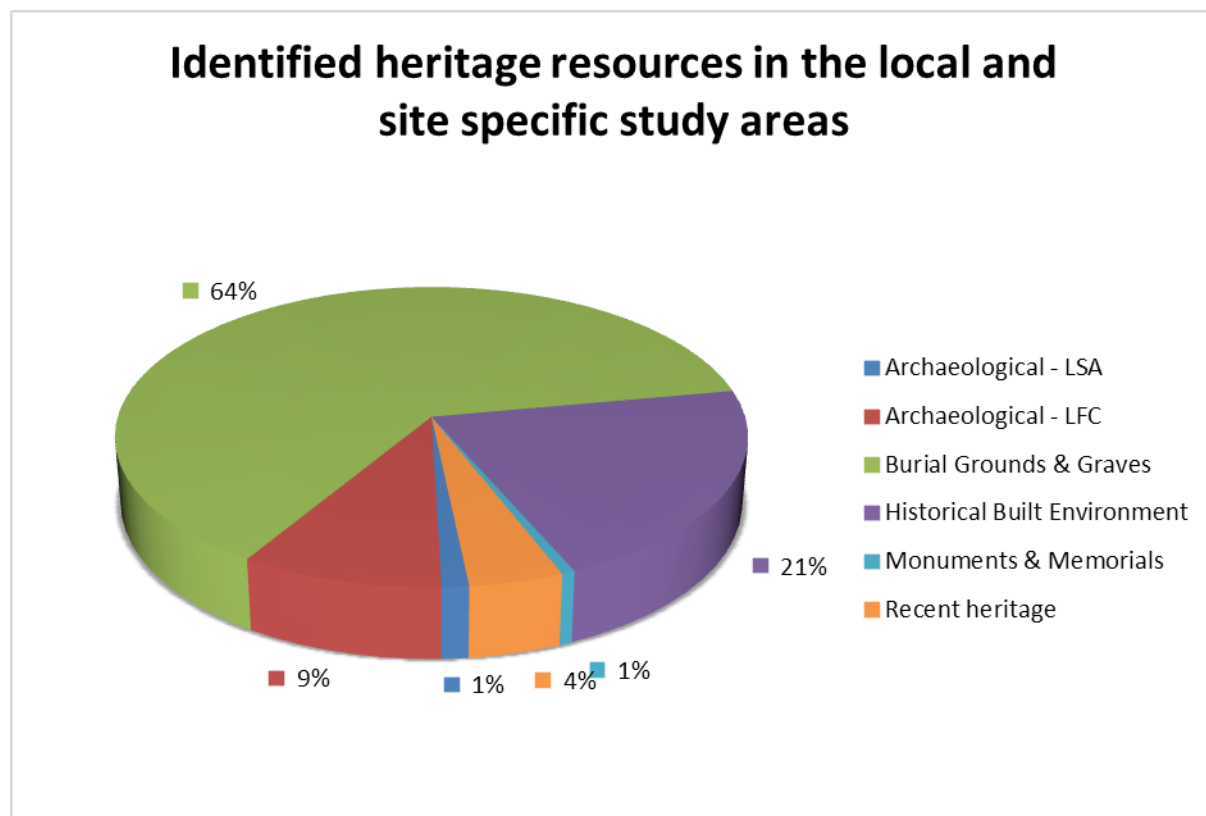
- **Cumulative heritage impacts** that change the CS and integrity of heritage resources due to in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
  - **Additive:** the simple sum of all the effects, e.g. the 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 particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
  - **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.
  - **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 Cultural Heritage Baseline

The cultural heritage baseline description considered the predominant landscape based on known sensitivities and the identified heritage resources within the local and site-specific study areas.

The Project is underlain by lithostratigraphy that must be considered in terms of its palaeo-sensitivity to comply with the minimum requirements stipulated by SAHRA (SAHRA, 2017). Furthermore, the identified tangible heritage resources demonstrate that the landscape is primarily associated with the historical period, with very limited expressions of the Late Stone Age (LSA) and Late Farming Community (LFC) periods (Figure 5-1).

Based on these findings, this section considers the geology and palaeontological context and historical period to offer the reader background and identify potential heritage risks and impacts relative to the Project, as described in Section 1.2 above.



**Figure 5-1: Identified Heritage Resource Types within the Local and Site-Specific Study Areas**

## 5.1 Geology and Palaeontological Context

The Main Karoo Basin comprises lithostratigraphic units associated with the Karoo Supergroup, dating to the Late Carboniferous to Middle Jurassic periods (~320 - 145 million years ago [Ma]).

Briefly, the Main Karoo Basin constitutes a retro-arc foreland basin. Johnson, et al. (2006) bases this designation as a retro-arc foreland basin on the following:

- It has a thick flysch-molasse succession which wedges out northwards over the adjacent craton;
- Its position behind an inferred magmatic arc; and
- The associated fold thrust belt produced by northward subduction of oceanic lithosphere located south of the arc.

These processes allowed sedimentation of the basin through which the various groups, sub-groups and formations of the Karoo Supergroup of the Project Area were formed. Covering an approximate extent of 700 000 km<sup>2</sup>, the Karoo Supergroup is famously known for its terrestrial vertebrate fossils, distinctive plant assemblages, thick glacial deposits and

extensive dolerite dykes and sills (Johnson, Van Vuuren, Hegenberger, Key, & Shoko, 1996; Johnson, et al., 2006).

The site-specific study area is associated with the *Vryheid Formation*, the primary fossiliferous resource. It corresponds to the basal unit of the Ecca Group deposited in a deltic<sup>6</sup> environment at ~180 Ma. Bamford (2012) suggested a model comparable to periodic flooding of marshes. This formation is inherently associated with shales, sandstones, mudstones and coal. In this region, the *Vryheid Formation* comprises coals seams 1 – 5, the thickness and height of which are influenced by the basal topography of the aforementioned Karoo Basin (Bamford, 2016; Bamford, 2014b).

Coal is formed by the compression and heat alteration of plant matter. Through this formation process, the coal is altered to the point that any potential plant fossil remains are unrecognisable. The shales found between the coal horizons and to a lesser degree the sandstone surface outcrops, however, have the potential to preserve examples of plant fossils (Bamford, 2014a; Bamford, 2016). This notwithstanding dykes and sills of dolerite are very common within the region. Bamford (2014b) notes that these dykes and sills devolatilize the coal and destroy the fossiliferous material in the associated shales, meaning that preservation of fossil plants is very patchy and usually poor.

Based on experience and similar projects within the local study area, Bamford (2014b) suggests that due to the “patchiness” in the distribution and the low probability of identifying good quality surface expressions of fossils, a meaningful Palaeontological Impact Assessment (PIA) would only be feasible once the proposed open-pit mining has exposed the associated shale stratigraphy. To this effect, commensurate recommendations are presented in Section 11 below.

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<sup>6</sup> River deposition of lithologies onto an alluvial plain.



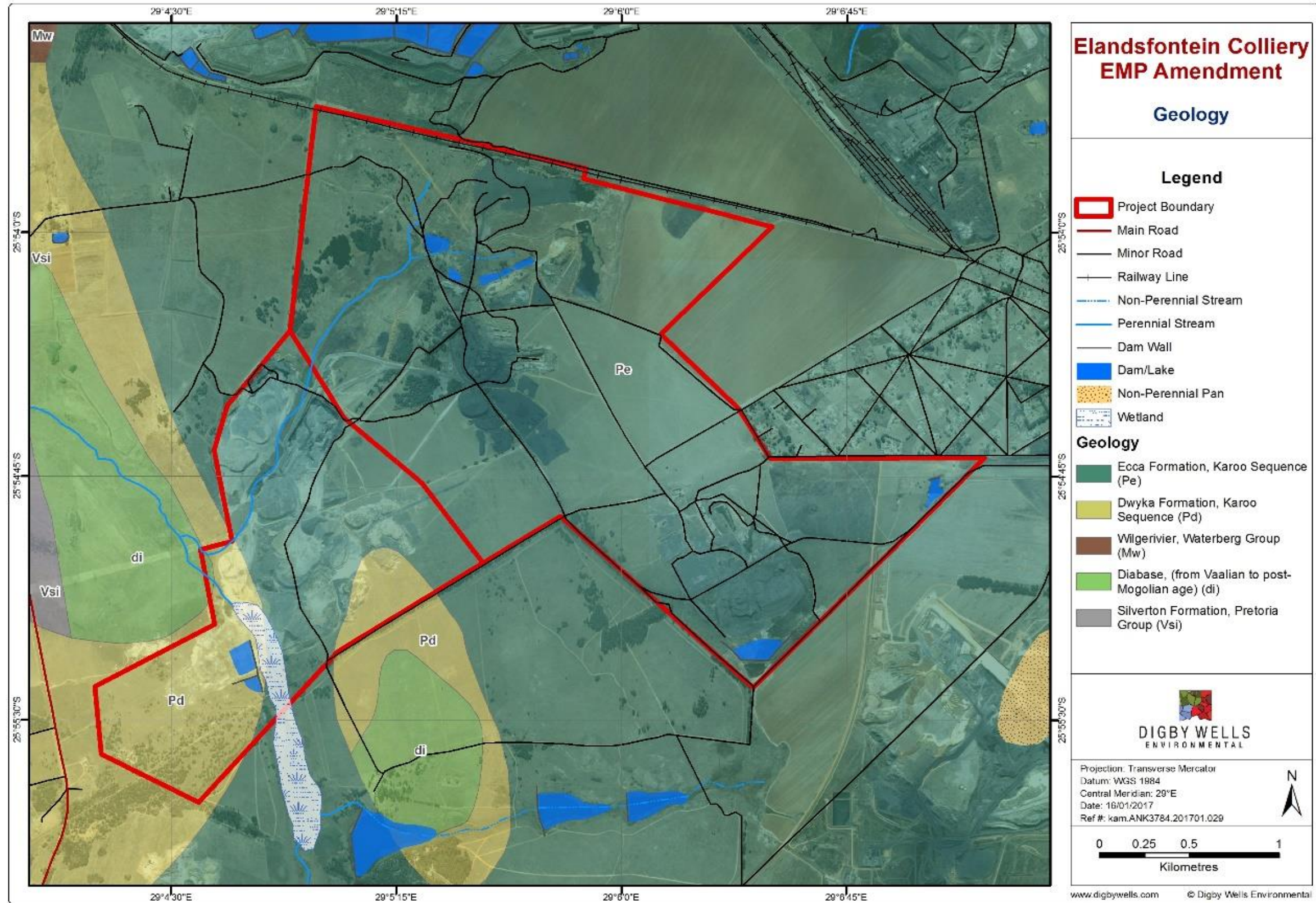


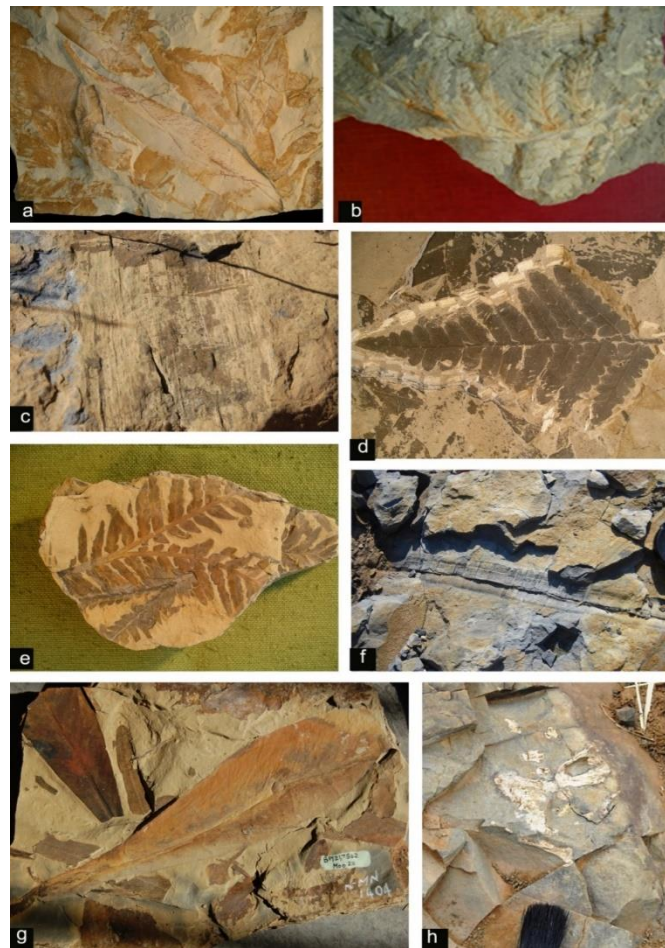
Figure 5-2: Geological Context of the Site-Specific Study Area





**Table 5-1: Geological sequence and palaeontological sensitivity for the site-specific study area**

	Era	Period	Ma	Lithographic Units			Significance	Fossils
				Supergroup	Group	Formation		
Eon	Palaeozoic	Permian		Karoo Supergroup	Eccla Group	Vryheid	Very-high	Abundant plant fossils of <i>Glossopteris</i> and other plants. Trace fossils. The reptile <i>Mesosaurus</i> has been found in the southern part of the Karoo Basin. Rich fossil plant assemblages of the Permian <i>Glossopteris</i> Flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales.



**Figure 5-3: Composite of possible Karoo-aged fossil plants that may be identified within the site-specific study area (Bamford, Environmental Authorisation for the Proposed Invula Mine: Palaeontological Impact Assessment addendum to the Heritage Impact Assessment, 2016)**

## 5.2 Historical Period

Within southern Africa, the historical period has traditionally been associated with the written records of contact between local indigenous groups and European settlers. In this region, however, 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 identities of European contact. This period is currently not well documented and is being explored through the 500 year initiative (Swanepoel, Esterhuysen, & Bonner, 2008).

While these complexities are acknowledged by the author, this section provides a high-level overview of the interrelated communities that occupied this region to contextualise the historical period of the site-specific study area.



Archaeological evidence and oral histories suggest that Bantu-speaking groups started settling the region from approximately the 15<sup>th</sup> century onwards. Occupation of the Highveld by Bantu-speaking groups commenced with Sotho-Tswana speakers first, followed by the spread of the Nguni from the 17<sup>th</sup> century (Delius & Cope, 2007). Internal conflict within Nguni groups surrounding various succession disputes and factionalism accelerated change within the region, culminating in a period of great turmoil and violence during the early 19<sup>th</sup> century between the Nguni, Swazi, Ndebele, Shangaan and Pedi nations. The period was known as the *Mfecane* (Garstang, Coleman, & Therrell, 2014) (Cadman, 2007; Pelsler, Van Schalkwyk, Teichert, & Masiteng, 2006; Garstang, Coleman, & Therrell, 2014).

The *Voortrekkers* moved into the interior during the mid-19<sup>th</sup> century in the wake of the *Mfecane*. This group was considered to be largely self-sufficient, basing their economy on farming and herding practices. During the initial settlement in the region, few towns were established. Pedi and smaller groups of Ndzundza Ndebele and Kopa also occupied the region during the mid-19<sup>th</sup> century, but unlike the larger Swazi and Pedi groups, often came into direct conflict with the *Zuid Afrikaansche Republiek (ZAR)* (Delius & Cope, 2007). With the discovery of coal in the region and gold on the Witwatersrand, the region began a period of development. Several of the towns surrounding the site-specific study area were established during this period, including Ogies (1885) and Witbank (1890).

Subsequent to this, tensions between Great Britain and the ZAR culminated in the South African War (i.e. Anglo Boer War) of 1899 – 1902. Most notably within the region is the Battle of Bakenlaagte of 30 October 1901. Briefly, the battle entailed the Eastern Transvaal Boer commandos of Generals Grobler, Brits, Viljoen and Louis Botha attacking the rear guard of Colonel Benson's much feared No. 3 Flying Column while it was in marching formation to its base camp. The Column's rear guard were outnumbered. These 210 Commonwealth troops set up a defensive position on Gun Hill and fought about 900 Boers in a close quarter twenty minute gun fight that ended only when the column rear guard was annihilated. The combined casualties numbered 87 killed with 182 wounded (Von der Hyde, 2013).




During this period of conflict, the Clewer Station served as hospital for the wounded British soldiers, and a concentration camp was established near the Balmoral Station to the north-west of the site-specific study area (Cloete, 2000).

Following the war, the exploitation of coal and the industrialisation of the region intensified. This is evidenced through the opening and intensification of operations at Steenkoolspruit Mine, Brugspruit Adit, Maggies Mine, Douglas Mine, and the Ogies-Tweefontein Mine (Falconer, 1990).





### 5.3 Results of the Field Survey

**Table 5-2: Results of the Field Survey**

Site Name	Latitude	Longitude	Description	Photographs
11478/BGG-001	-25.908662	29.083866	<p>Historic burial ground of farm labourers. Comprises at least 15 graves with either stone or granite surface dressing. The identifiable family names include:</p> <ul style="list-style-type: none"> <li>- Nkabande;</li> <li>- Masilela;</li> <li>- Mahlalisa.</li> </ul> <p>One Next-of-Kin known to still attend to the burial ground. Client has the contact details if required. Within 30 m proximity to open pit area. Site has been demarcated and fenced off.</p>	
11478/BGG-002	-25.909298	29.085263	<p>Historic burial ground of farm owners comprising at least 40 graves. The graves have either concrete, slate or granite surface dressing, some of which have collapsed over time. The identified family names include:</p> <ul style="list-style-type: none"> <li>- Vorster;</li> <li>- Hatting;</li> <li>- Venter;</li> <li>- Jordaan;</li> <li>- van Blijenburgh;</li> <li>- Lecante;</li> <li>- O' Niel.</li> </ul> <p>Client stated that the associated werf has been removed through mining related activities. The burial ground is situated within 50 m proximity to open pit and related mining activities. The site has been demarcated and fenced off.</p>	
11478/BGG-003	-25.912401	29.090872	<p>Historic burial ground comprising at least 8 graves. The graves have either stone dressing or concrete surface dressing. The headstones are severely weathered and inscriptions are not legible. One family name was identified, Mashego. The site is situated on an island between the mine road, underneath a powerline routing. Mining activities will not occur within 100 m of the established powerline and graves. The site is not demarcated or fenced.</p>	



Site Name	Latitude	Longitude	Description	Photographs
11478/BGG-004 (10260/nearLDTP21)	-25.910433	29.107089	<p>Location of the municipal cemetery for Clewer. Site is demarcated and surrounded by concrete palisade fence and access controlled.</p> <p>Situated on the mine boundary adjacent to the Elandsfontein Colliery offices.</p>	
11478/BGG-005 (10260/nearLDTP45) (9060/Feature5)	-25.911806	29.11055	<p>Burial ground comprising at least 10 graves situated along Apex / Boundary Road, within the Elandsfontein Colliery 134MR area. The graves all have granite surface dressings that have been damaged through time. Identified family names include:</p> <ul style="list-style-type: none"> <li>- Smit;</li> <li>- du Plessis;</li> <li>- Gouws.</li> </ul> <p>The burial ground is outside of planned future mining areas. The site is not demarcated or fenced.</p>	

## 6 Impact Assessment

### 6.1 Cultural Significance

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 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 of the assessor to determine resources' significance to allow implementation of appropriate management measures. This is achieved through assessing heritage resources value relative to certain prescribed criteria encapsulated in policies and legal frameworks.

A single category of heritage resources was identified within the site-specific study area, namely burial grounds and graves. The CS of identified heritage resources were determined through the methodology presented in Section 4.4.1 above to assist in providing the appropriate management and mitigation measures in accordance with the published SAHRA minimum standards.

The assessment of the CS and Field Ratings demonstrated that the identified burial grounds and graves have a very high CS. The motivation and assessment for the assigned ratings is summarised in Table 6-1.



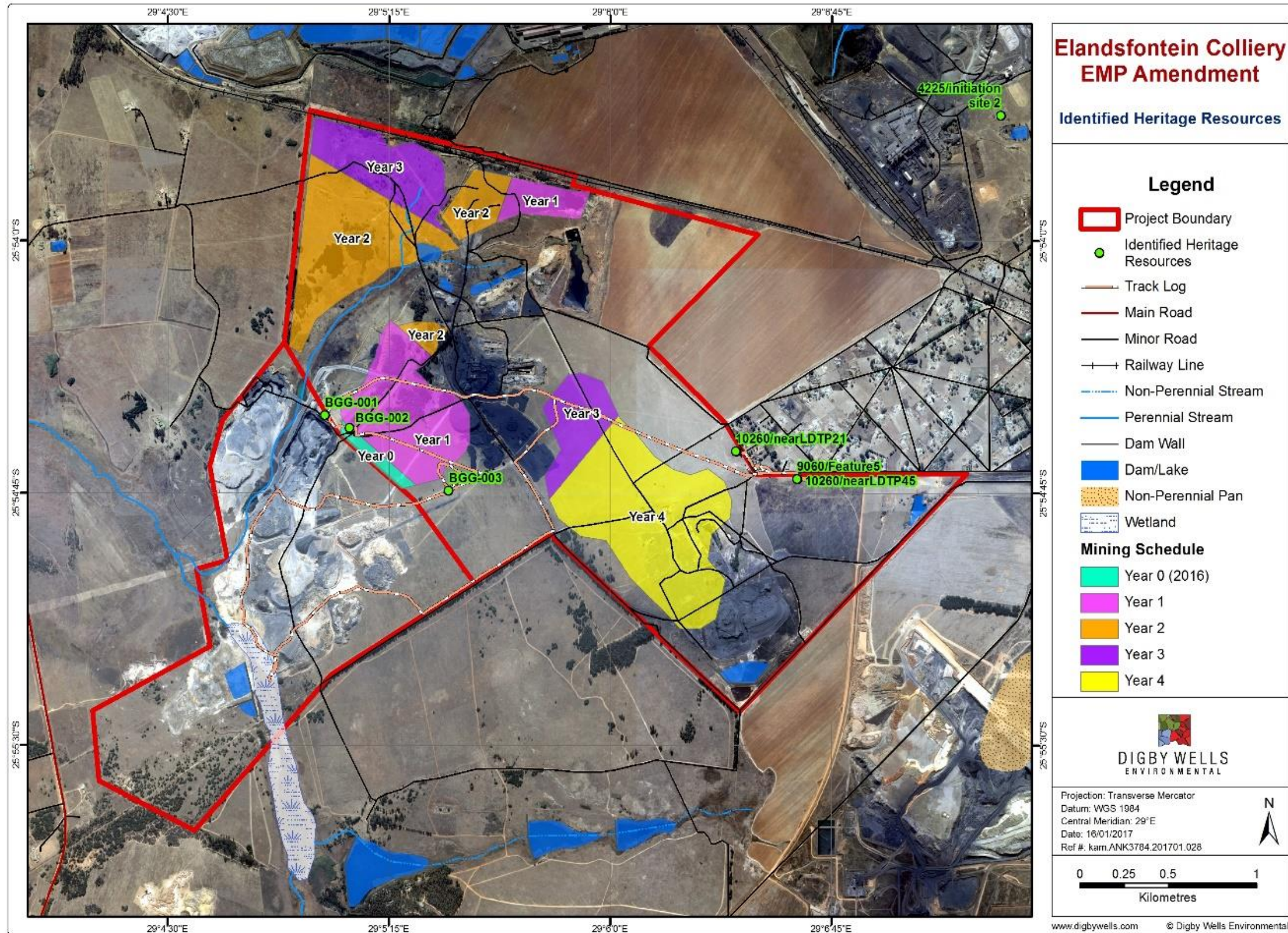


Figure 6-1: Identified Heritage Resources and Mining Schedule



**Table 6-1: CS Assessment for identified heritage resources within the Elandsfontein 314 MR and 63 MR**

Resource ID	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE	Designation	Recommended Field Rating
Burial grounds and graves	- Burial grounds and graves were not assessed against aesthetic criteria as defined in Section 3(3) of the NHRA	- Burial grounds and graves were not assessed against historic criteria as defined in Section 3(3) of the NHRA	- Burial grounds and graves were not assessed against scientific criteria as defined in Section 3(3) of the NHRA	<b>5</b> Burial grounds and graves have specific connections to communities or groups for spiritual reasons. The significance is universally accepted	<b>4</b> The integrity of burial grounds is considered to be excellent with both tangible and intangible fabric preserved.	20	Very High	Grade I <sup>7</sup>

<sup>7</sup> Field ratings considered the assigned CS and the level of official management required or the local competency of heritage authorities. Currently the MPHRA is only competent to manage and issue permits on NHRA Section 34 heritage resources, and no local (i.e. local government) competency exists within the province. All decisions relating burial grounds and graves therefore fall under the ambit of SAHRA.

## 6.2 Heritage Impact Assessment

This section considers the potential impacts to the identified burial grounds and graves that may result due the open-pit mining of the No. 2 seam on 314MR. The associated activities include:

1. Removal of vegetation and topsoil;
2. Stockpiling of topsoil;
3. Removal of overburden;
4. Stockpiling of overburden;
5. Mining of coal (including drilling and blasting); and
6. Transportation of material.

The construction and operation phases of the Project present the greatest likelihood to negatively impact on the burial grounds BGG-001, BGG-002 and BGG-003 as these occur directly adjacent to, or within the development footprint of the Project. BGG-004 and BGG-005 occur within the site-specific study area and may be subject to indirect impacts that manifest as a direct, physical change to the resource.

Consideration of the potential impacts to the burial grounds and graves are presented in Table 6-2.

**Table 6-2: Summary of Identified Potential Impacts and Management Objectives based on the SAHRA Minimum Standards**

Project Activity	Impact Type	Impact Description	Management Objectives	Actions and Targets <sup>8</sup>
Construction: Removal of topsoil and overburden.	Direct Negative Impact	Destruction of BGG-002 resulting in permanent changes to the physical and intangible integrity of the resource.	Avoid negative impacts through project related mitigation measures.	Project design must be amended to remove all negative impacts and conserve the resource in its entirety. A
Operation: Mining of coal			Where project related mitigation	

<sup>8</sup> It must be noted that the SAHRA minimum standards guide mitigation, and the recommendations provided in this HIA are project specific.



Project Activity	Impact Type	Impact Description	Management Objectives	Actions and Targets <sup>8</sup>
		Loss of intangible integrity or degradation of intrinsic CS of burial grounds and graves through restricted access to Next-of-Kin (NoK).	measures are not feasible, reduce the intensity of negative impacts through heritage related mitigation measures.	Conservation Management Plan (CMP) must be developed for all burial grounds and graves within the site-specific study area

A detailed assessment of the identified potential impacts to the burial grounds and graves for pre- and post-mitigation scenarios is presented in the following tables:

**Table 6-3: Impact Description for the Destruction of BGG-002 within the Year 0 Open Pit Area**

IMPACT DESCRIPTION: Changes to the physical and intangible integrity of BGG-002, i.e. destruction				
Dimension	Rating	Motivation		
<b>Pre-Mitigation</b>				
Duration	Permanent (7)	The destruction of burial grounds and graves through construction and operational activities will be permanent		
Extent	National (6)	Unmitigated alteration of the current status quo of the identified burial grounds will have repercussions to NoK and the reputation of Anker Coal. Additionally, unmitigated changes to graves will result in the involvement of local, provincial and national authorities, as well as potentially national media attention.	Consequence: Extremely detrimental (-20)	Significance: Major - negative (-140)



<b>IMPACT DESCRIPTION: Changes to the physical and intangible integrity of BGG-002, i.e. destruction</b>				
<b>Dimension</b>	<b>Rating</b>	<b>Motivation</b>		
Intensity x type of impact	Extremely high - negative (-7)	This will be a major change to a heritage resource with very high CS		
Probability	Certain (7)	Without appropriate mitigation, the identified impacts will manifest		
<b>Mitigation</b>				
<p>Planned open pit mining for Year 0 and the southern portion for Year 1 must be excluded from construction and operational phases to conserve the burial ground BGG-002 <i>in situ</i>, and reduce the intensity of the identified risks to BGG-001 and BGG-003. All identified burial grounds and graves must be subject to a Burial Grounds and Graves Consultation (BGGC) Process to identify <i>bona fide</i> NoK, reach agreement on the management and access to the sites, and formalise agreements in a CMP.</p> <p>The assessor is aware that the location of the open pit is limited by the distribution of No.2 seam, and exclusion of portions of the planned open pit may not be economically viable. Where the proposed recommendations are not feasible, a Grave Relocation Process (GRP), supported by the aforementioned BGGC process must be completed. The GRP is regulated by Section 36 of the NHRA and Chapters XI and IX of the Regulations to the Act (GN R 548).</p>				
<b>Post-Mitigation</b>				
Duration	Beyond project life (6)	The relocation of the burial grounds will result in an immediate change to the burial grounds and graves, the effects of which, such as social issues, may extend beyond the life of the project.	Consequence: Highly detrimental (-14)	Significance: Minor - negative (-70)
Extent	Limited (2)	The extent of the impact will be limited to burial grounds and graves within the project boundaries and the identified NoK		



<b>IMPACT DESCRIPTION: Changes to the physical and intangible integrity of BGG-002, i.e. destruction</b>				
<b>Dimension</b>	<b>Rating</b>	<b>Motivation</b>		
Intensity x type of impact	Very high - negative (-6)	Grave relocation is inherently negative, as the physical and social contexts of graves are destroyed through the act of exhumation and relocation. Relocation is considered a permanent, partial change to the meaning and setting of the heritage resource.		
Probability	Likely (5)	While <i>in situ</i> conservation is the preferred mitigation measure, it is likely that a GRP will be required when considering the distribution of the No. 2 coal seam.		

**Table 6-4: Impact description for the restricted access to burial grounds and graves**

<b>IMPACT DESCRIPTION: Degradation of intrinsic CS of identified burial grounds and graves through restricted access</b>				
<b>Dimension</b>	<b>Rating</b>	<b>Motivation</b>		
<b>Pre-Mitigation</b>				
Duration	Project Life (5)	The degradation of the intrinsic CS through unconditioned restricted access to burial grounds should only occur during the LoM, and can be restored post-mining.		
Extent	National (6)	A conservative approach, assuming NoK could be distributed throughout South Africa, has been adopted. Any unpermitted changes to burial grounds can at the very least affect descendent communities and possibly result in	Consequence: Highly detrimental (-16)	Significance: Major - negative (-112)



<b>IMPACT DESCRIPTION: Degradation of intrinsic CS of identified burial grounds and graves through restricted access</b>				
		social and / or legal repercussions that may require intervention by national structures (e.g. SAHRA).		
Intensity x type of impact	High - negative (-5)	Burial grounds are assigned very high CS in addition to be generally protected under the NHRA and other national and provincial legislation. Any unpermitted changes to burial grounds are therefore considered highly negative.		
Probability	Certain (7)	The reduction in intrinsic CS through unconditioned restricted access is certain to occur during the LoM.		
<b>Mitigation</b>				
<p>Complete a BGGC process in accordance with Section 36 of the NHRA and Chapter IX of the Regulations to the Act to reach agreement with <i>bona fide</i> NoK on access and conservation of the burial grounds and graves. The agreements must be encapsulated within a CMP.</p> <p>The CMP must at a minimum:</p> <ul style="list-style-type: none"> <li>- Identify and record all graves within the site-specific study area;</li> <li>- Complete detailed mapping and numbering of all identified graves for management and record purposes;</li> <li>- Assess current status and damage caused through previous operational activities;</li> <li>- Establish a roles and responsibility matrix;</li> <li>- Establish a monitoring process and schedule;</li> <li>- Define conditions for project specific management and monitoring protocols;</li> <li>- Include a grievance mechanism to record any grievances received from NoK or other relevant parties.</li> </ul>				
<b>Post-Mitigation</b>				
Duration	Immediate (1)	Implementing Chapter XI of the SAHRA Regulations will enable negotiated agreements with NoK to be reached. The degradation of intrinsic CS through	Consequence: Moderately beneficial (12)	Significance: Minor - positive (72)



<b>IMPACT DESCRIPTION: Degradation of intrinsic CS of identified burial grounds and graves through restricted access</b>				
		agreed upon conditional access can therefore be eliminated or reduced.		
Extent	National (6)	A conservative approach, assuming NoK could be distributed throughout South Africa, has been adopted. Changes to burial grounds, including approval of CMPs will need to be authorised by SAHRA.		
Intensity x type of impact	High - positive (5)	Proposed mitigations will promote the management and conservation of the burial grounds and graves, and maintenance of the intrinsic CS through conditioned access. This is considered to be a positive minor change to the quality and setting of the heritage resource.		
Probability	Highly probable (6)	It is highly probable that while potential damage to burial grounds may occur, and there may be conditioned access restrictions, the proposed recommendations will either remove or mitigate the identified impacts.		

## 7 Cumulative Impacts on the Cultural Landscape

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.





The local study area comprises several mining operations and planned developments in line with the strategic development plans for Mpumalanga, therefore requiring greater consideration of the possible in-combination effects of various impacts on known heritage resources.

The following possible cumulative impacts of the Project have been identified:

**Table 7-1: Summary of potential cumulative impacts**

Type	Cumulative Impact	Direction of Change	Extent of Impact
Synergistic Space crowding	Continued contribution to the enhancement of an industrial / mining landscape. A change to the sense-of-place of the cultural landscape from a historic, agrarian cultural landscape.	Negative	Regional
Additive	The continued effects of vibrations and fly rock from blasting activities on the integrity of the surface dressing of burial grounds and graves.	Negative	Site-specific
Additive Synergistic	Increased significance of remaining <i>in situ</i> archaeological sites and accumulations regardless of integrity within the greater local study area	Negative	Local

## 8 Low Risk and Unplanned Events

This section considers the potential heritage risks that could arise for Anker Coal, low risks to heritage resources that may result from certain project activities and possible unplanned events.

Firstly, potential heritage risks that could arise *for* Anker Coal may manifest as:

- Risks resulting from significant resources to the development of the Project; and
- Impact on heritage resources that may have social repercussions or result in litigation.

These are presented in Table 8-1 below.

**Table 8-1: Identified heritage risks that may arise *for* Anker Coal**

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. Within the site-specific study area, these include burial grounds and graves protected by Section 36 of the NHRA.	Negative Record of Decision (RoD) and/or development restrictions issued by SAHRA and/or MPRHA in terms of Section 38(8).



Description	Primary Risk
<p>Impacting on heritage resources formally and generally protected by the NHRA without following due process.</p> <p>Due process may include social consultations and/or permit application processes to SAHRA and/or MPRHA.</p>	<p>Social repercussions</p> <p>Fines</p> <p>Penalties</p> <p>Seizure of Equipment</p> <p>Compulsory Repair / Cease Work Orders</p> <p>Imprisonment</p>

Low risks to heritage resources, where identified, can be monitored to gauge if the baseline changes and mitigation is required. Unplanned events are events that can occur on any project and cannot be monitored, but can, however, be planned for to reduce the severity of potential impacts if and where they occur.

Information on the potential impacts of unplanned events and management plans are summarised in Table 8-2:

**Table 8-2: Summary of potential unplanned events, potential impacts, and proposed mitigation and management**

Low Risk / Unplanned Event	Potential impact	Mitigation / Management / Monitoring
Blasting activities that cause vibrations and fly rock	Damage to heritage resources generally protected under Section 36 of the NHRA	Compile and implement the aforementioned CMP to manage any accidental damage to burial grounds and graves.
Accidental exposure of previously unidentified heritage resources during the construction of the Project.	Damage or destruction of heritage resources generally protected under Section 35 of the NHRA	Project specific Chance Find Protocols (CFPs) must be developed and included in the EMP as a condition of authorisation. The CFPs must clearly describe the type of heritage resources that may occur within the site specific project area, the protocol to follow in the event of accidental exposure of previously unidentified heritage resources, and the appropriate management measures and reporting structures to be adhered to.
Accidental exposure of human remains during the construction phase of the Project.	Damage or destruction of heritage resources generally protected under Section 36 of the NHRA	The CFPs must be defined and established prior to the construction phase of the proposed Project.

## 9 Heritage Impacts versus Socio-Economic Benefits

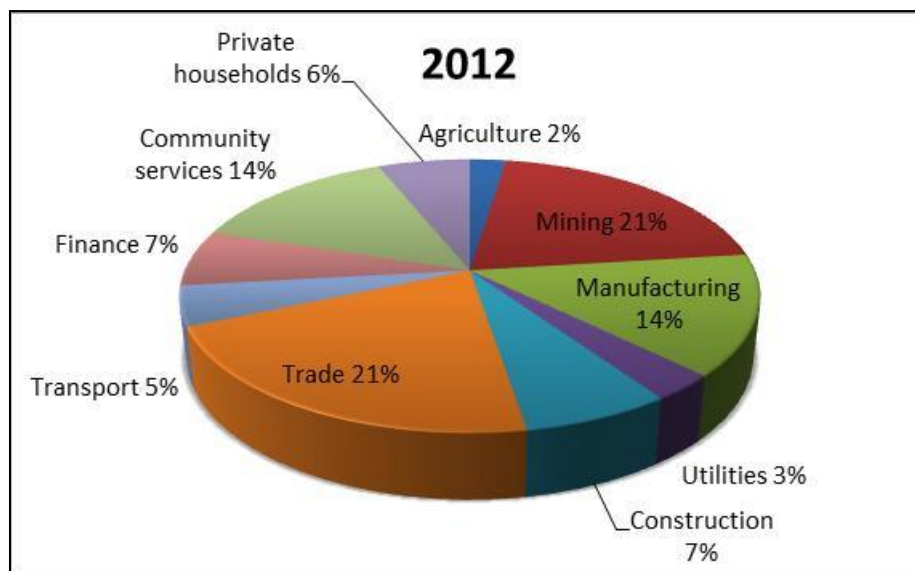
The Project is situated within the ELM of the NDM in Mpumalanga. Information gathered for these municipalities during the 2011 census demonstrated that the ELM comprised a population of 395 466, of which 190 662 (48%) were economically active.

While almost half of the population were considered to be within the working age group (i.e. 16 – 64 years), 27.3% were unemployed, and 36.1% received less than R 3000.00 per month. These figures all contributed to a dependency ration of 40.4% for the ELM (Statistics SA, 2011).

Within the ELM Integrated Development Plan (IDP) (eMalahleni Local Municipality, 2016), the municipality identified several objectives and priority areas, *inter alia*:

- Sustainable economic growth;
- Facilitating the development of an effective and efficient workforce; and
- Focus on Local Economic Development (LED) programmes.

While it is acknowledged that the ELM contains a large number of heritage assets that are under threat through rapid development, the mining industry is one of the primary employers within the region, contributing 20.6% to employment.



**Figure 9-1: Dominant employment sectors within the ELM (eMalahleni Local Municipality, 2016)**

As such, mining developments and operations are highlighted as an opportunity for an increased revenue base. To this effect, the current operations of the Project are viewed as positive contributors to economic growth, sustainable employment, and a vehicle for LED initiatives (eMalahleni Local Municipality, 2016).

These factors demonstrate that the current and continued operation of the Project will contribute to achieving the objectives and priorities identified in the ELM IDP. Therefore, the potential socio-economic benefits that may be derived from the Project are greater than the identified potential impacts to the known heritage resources.

This statement is based on the following:

- The identified heritage resources, through the proposed interventions, can be maintained *in situ*, and if necessary, mitigated through the proposed recommendations;
- The Project will contribute to the increased energy security of South Africa through providing coal to Eskom, one of the national strategic directives;
- The Project will contribute to the economic development of the local study area;
- The Project can contribute to LED initiatives; and
- The Project will promote the growth of both the formal and informal retail and service sector that may benefit individuals through indirect employment.

## 10 Consultation

The consultation process affords Interested and Affected Parties (I&APs) opportunities to engage in the EIA process. The objectives of the 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 heritage-specific consultation was undertaken for this assessment, and at the time of compiling this report the required SEP had not commenced.

All comments received through the public review of this report and the draft EIA / EMP will be collated into a Comments and Response Report (CRR) to respond to and address any comments raised.

The final EIA / EMP, CRR and HIA will be submitted to SAHRA and MPRHA for adjudication as required in terms of Section 38(8) of the NHRA.

## 11 Recommendations and Conclusion

This HIA was compiled to promote compliance with Section 38(8) of the NHRA as part of the Section 102 amendment of the approved Elandsfontein EMP. It considered the baseline cultural environment at local and site-specific study area levels to identify and classify tangible heritage resources that may be impacted upon by project related activities.

A total of 164 heritage resources are known to occur within the local study area, over 90% of which relate to the historical period. These findings demonstrate that the cultural landscape is predominantly associated with historic agrarian and mining landscape, as presented in Section 5.2 above.

Within the site-specific study area, five burial grounds and graves with very high CS were identified. Of these, three may be directly impacted upon by the proposed project related activities. These include:

- BGG-001, adjacent to Year 0 (~120 m away) and 1 (~85 m away) open pit areas;
- BGG-002, within Year 0 open pit area; and
- BGG-003, adjacent to Year 1 (~80 m away) open pit area.

To mitigate against potential direct negative impacts, the following recommendations are applicable:

- Project related mitigation includes the exclusion<sup>9</sup> of the planned open pit mining areas for Year 0 and the southern portion for Year 1 construction and operational phases to conserve the burial ground BGG-002 *in situ*, and reduce the intensity of potential impacts to BGG-001 and BGG-003;
- All burial grounds and graves within the site-specific study area must be subject to a BGGC Process to identify *bona fide* NoK, reach agreement on access to and management of the sites, and formalise agreements in a CMP. The CMP must at a minimum:
  - Identify, accurately map, mark, number and photograph all burial grounds and graves within the site-specific study area;
  - Assess current status of and damage to surface dressing caused through previous operational activities;
  - Include Standard Operating Procedures for:
    - a) Controlled access to burial grounds and graves by NoK; and
    - b) Roles and responsibility matrix for maintenance of burial grounds and where required, repairs to / replacement of surface dressings;
  - Define conditions for project specific management and monitoring protocols;
  - Establish a monitoring process and schedule;
  - Include a grievance mechanism to record any grievances received from NoK or other relevant parties;

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<sup>9</sup> The author acknowledges that the location of the open pit areas is restricted by the distribution of the coal resources. While this mitigation may be determined to be unfeasible, the proponent must consider project related mitigation measures to remove identified negative impacts to heritage resources.

- Define a GRP framework for where burial grounds and graves are under immediate and direct threat; and
- Where the proposed recommendations are not feasible, a GRP as regulated by Section 36 of the NHRA and Chapters XI and IX of the Regulations to the Act (GN R 548), and supported by the aforementioned BGGC process and CMP must be completed.

*In lieu* of the recommended CMP, the following immediate management measures must be completed to safeguard against possible negative impacts to the sites BGG-001, BGG-002 and BGG-003 specifically:

1. The burial grounds and graves must be clearly demarcated to demonstrate the extent of the burial grounds;
2. The burial grounds and graves must be fenced with an access gate to allow for unrestricted access to NoK;
3. The burial grounds and graves must be accurately mapped, marked, numbered and photographed for record, monitoring and management purposes;
4. The burial grounds and graves must be plotted against the mines working plan;
5. A minimum buffer of 50 m surrounding the burial grounds and graves must be established and maintained, within which no mining activities may be performed;
6. The burial grounds and graves must be maintained by the mine through vegetation control and site cleaning on a regular basis.



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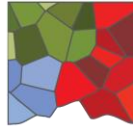
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## **Appendix A: Environmental Management Plan – Heritage Specific**



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## 1 Environmental Management Plan

The objective of an EMP is to present mitigation to (a) manage undue or reasonably avoidable adverse impacts associated with the development of a project and (b) enhance potential positives.

The key objectives of EMPs are to give S.M.A.R.T.<sup>1</sup> mitigation measures to:

- Identify the actual environmental, socio-economic and public health impacts of the project and check if the observed impacts are within the levels predicted in the EIA;
- Determine that mitigation measures or other conditions attached to project approval (e.g. by legislation) are properly implemented and work effectively;
- Adapt the measures and conditions attached to project approval in the light of new information or take action to manage unanticipated impacts if necessary;
- Provide an auditable management plan that can follow the Deming Cycle<sup>2</sup>;
- Gauge if predicted benefits of the project are being achieved and maximized; and
- Gain information for improving similar projects and EIA practice in the future.

The EMP must consider each activity and its potential (significant) impacts during the construction, operational, decommissioning and post closure phases.

### 1.1 Project Activities with Potential Significant Impacts

Project activities that may impact upon heritage resources include:

- Site clearing, including removal of topsoil and vegetation; and
- Blasting and development of initial box-cut, including stockpiling.

These are summarised in Table 1-1 below.

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<sup>1</sup> S.M.A.R.T refers to specific, measurable, attainable, realistic and timely mitigation measures.

<sup>2</sup> The Deming cycle refers to a four-part management method that promotes continuous improvement. The Deming cycle is made up of:

Plan: Choose a process and set objectives

Do: Implement the plan and begin collecting data on the results

Check/Study: Analyse the results using statistical methods

Act: Decide what changes to make in order to improve the process

**Table 1-1: Potential Significant Project Impacts**

Project Phase / Activities	Potential significant project impacts
Construction Removal of topsoil and overburden	Destruction of burial grounds and graves
Operation Mining of coal	Loss of access to burial grounds and degradation on intrinsic value

## 1.2 Summary of Mitigation and Management

This section provides a summary of the project activities relevant to this study, the environmental aspect and impacts on the receiving environment. Information on the recommended mitigation, relevant legal requirements, recommended management plans and timing of implementation is presented in Table 1-2 and Table 1-3.

**Table 1-2: Mitigation and Management Plan**

Activities	Potential Impact	Size and scale of disturbance	Aspects Affected	Phase	Mitigation Type/Measures	Compliance with standards/Standard to be achieved	Time period for Implementation
Removal of topsoil and overburden	Destruction of burial grounds and graves, specifically BGG-002.	Year 0 = 3.5 ha Year 1 = 44.2 ha Year 2 = 55.6 ha	Heritage	Construction	Avoid through amendment of the infrastructure design. Where not feasible, a BGGC and GRP must be completed	NHRA Section 36 Chapters XI and IX of the NHRA Regulations	Pre-construction
Mining of coal	Loss of access to burial grounds and graves within the site-specific study area.	Year 3 = 38.9 ha Year 4 = 64 ha Total = ~206.5 ha		Operation	Reduce through the completion of a BGGC process and compilation / implementation of a CMP	NHRA Section 36 Chapters XI and IX of the NHRA Regulations	

**Table 1-3: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law**

Applicable Standard, Practice, Guideline, Policy or Law		
Title	Description of Requirements	Relevance to Project
<b>Legislation (National, Provincial, Local)</b>		
The National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Heritage resources within the Project development footprint are protected under Section 36 of the NHRA, and may not be impacted upon without the approval and necessary permits issued by SAHRA	Heritage resources protected under Section 36 have been identified within the site-specific study area.
Regulations to the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (GN R 548) (SAHRA Regulations)	Provisions for the procedure for consultation regarding burial grounds and graves are contained in Chapter XI. Where required, the application for relocation of graves is regulated by Chapter IX.	Burial grounds and graves have been identified within the site-specific study area. Agreement on the conservation and / or relocation of the graves must be reached in accordance with the regulations to ensure compliance with the legislative framework.
<b>Applicable Guideline/Standards</b>		
SAHRA Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment Reports	The guidelines provide the minimum standards for recommended mitigation under Section 7(1)(L)(d).	Specialist recommendations were considered against the minimum standards provided.

### 1.3 Monitoring Plan

Project specific CFPs must be developed for the Project. The purpose of the CFPs is to establish procedures that aim to minimise damage and destruction to any heritage resources that may be accidentally exposed during the course of development activities.

The CFPs must clearly describe the type of heritage resources that may occur within the site specific project area, the protocol to follow in the event of accidental exposure of previously unidentified heritage resources, and the appropriate management measures and reporting structures to be adhered to. The CFP at a minimum should include the following:

- Definitions as defined by Section 2 and 38(1) of the NHRA;
- Procedures that detail the following:
  - How to spot a chance find;
  - Steps to be undertaken when a chance find is made;
  - Internal reporting structures;
  - Recording of chance finds; and
  - Legal processes and requirements.

The CFPs must be defined and established as a condition of authorisation prior to the pre-construction phase of the proposed Project.

**Table 1-4: Monitoring plan**

Activities	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
Blasting	Loss of integrity of surface dressing of burial grounds and graves	Baseline condition recording Monitoring after blasting activities Reporting on possible manifestation of negative impacts Implementation of mitigation measures to reduce impacts	To be developed as part of the CMP	After blasting activities Quarterly



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## Appendix B: Plans















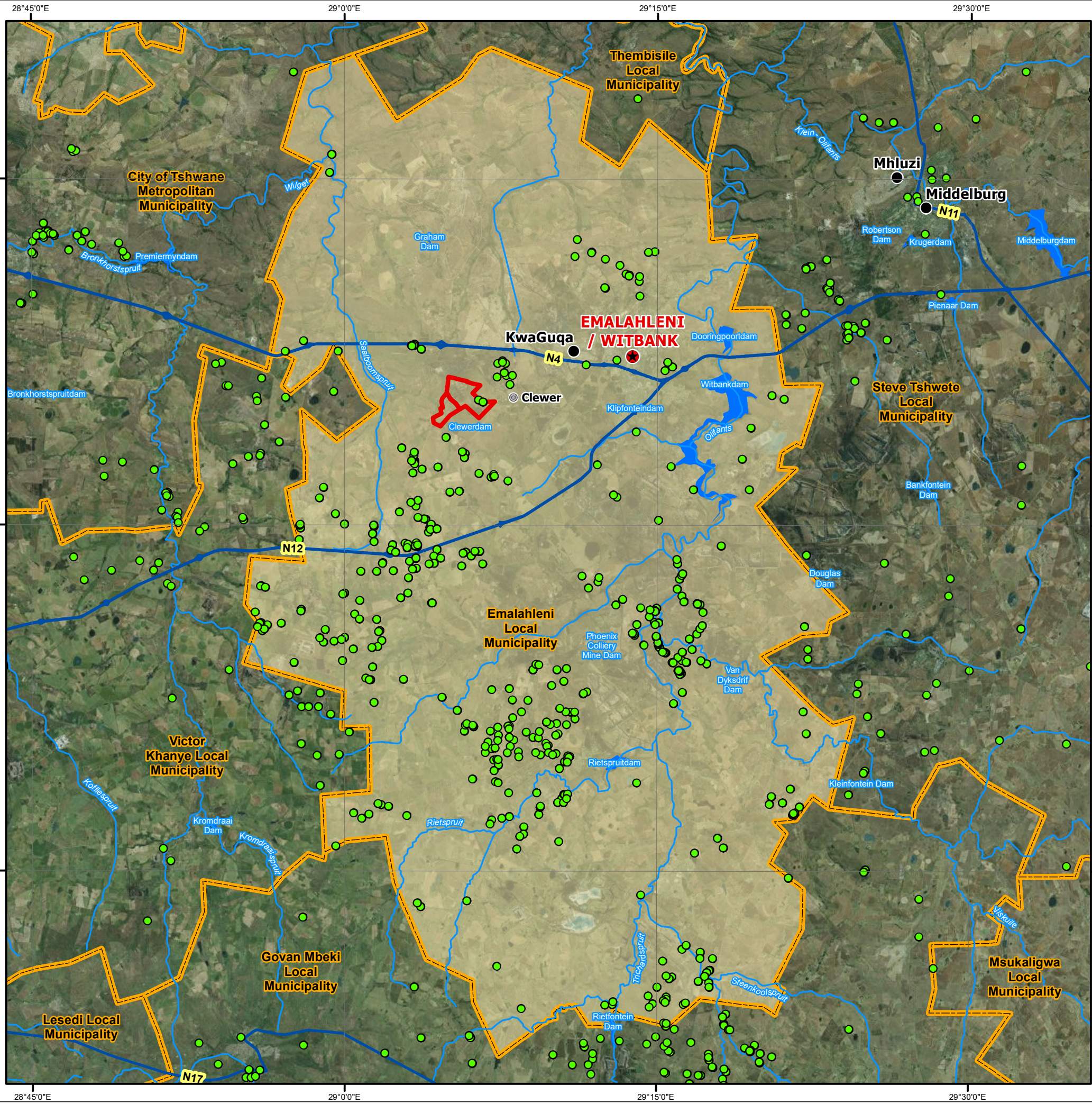


# Elandsfontein Colliery EMP Amendment

## Identified Heritage Resources

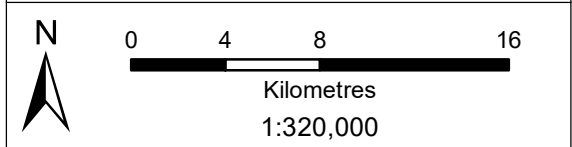
### Legend

-  Project Boundary
-  Identified Heritage Resources
-  City
-  Major Town
-  Other Town
-  National Road
-  River
-  Dam
-  Local Study Area
-  Local Municipal Boundary



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

Projection: Transverse Mercator      Ref #: kam.ANK3784.201701.028  
 Datum: WGS 1984                              Revision Number: 1  
 Central Meridian: 29°E                        Date: 16/01/2017





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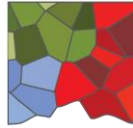
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## Appendix C: Specialist CV



# DIGBY WELLS

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Mr. Justin du Piesanie  
Unit Manager: Heritage Resources Management  
Social and Heritage Services Department  
Digby Wells Environmental

## 1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2015	Continued Professional Development, Intermediate Project Management Course	PM.Ideas: A division of the Mindset Group
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

## 2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

### 3 Employment

Period	Company	Title/position
2016 to present	Digby Wells Environmental	Unit Manager: Heritage Resources Management
2011-2016	Digby Wells Environmental	Heritage Management Consultant: Archaeologist
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

### 4 Experience

I joined the company in August 2011 as an archaeologist and was subsequently made unit manager in the Social and Heritage Services Department in 2016. I obtained my Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. I further attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. I am a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. I am also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. I have over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. I gained further generalist experience since my appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, I have acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. My current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.



## 5 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:	Description of the Project	Name of Client
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Archaeological surveys	ARM
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Phase 2 Mapping	Sun International
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey	ARM
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Heritage Basic Assessment	ARM
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Impact Assessment	Rhino Mines
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological surveys	Cronimet
Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement	Eskom
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Phase 2 Excavations	Heritage Contracts Unit
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Phase 2 Mapping	University of the Witwatersrand
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage survey	Umlando Consultants
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Archaeological Impact Assessment	ARM
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 Excavations	Heritage Contracts Unit
De Brochen and Booyensdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 Mapping	Heritage Contracts Unit
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Heritage Statement	Strategic Environmental Focus
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Phase 2 Mapping	Heritage Contracts Unit
Kibali Gold Project Grave Relocation Plan	Oriental Province, Democratic Republic of Congo	2011 2013	Grave Relocation	Randgold Resources
Kibali Gold Hydro-Power Project	Oriental Province, Democratic Republic of Congo	2012 2014	Heritage Impact Assessment	Randgold Resources
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Burial Grounds and Graves Survey	Platreef Resources
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Phase 2 Excavations	Resources Generation
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching Brief	Bokoni Platinum Mine





Project Title	Project Location	Date:	Description of the Project	Name of Client
SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Technical Reviewer	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment	Msobo
New Liberty Gold Project	Liberia	2013 2014	Grave Relocation	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage Impact Assessment	Atkins Limited
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of Intent to Develop	ERM Southern Africa
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Heritage Impact Assessment	ERM Southern Africa
Nzoro 2 Hydro Power Project	Orientele Province, Democratic Republic of Congo	2014 2014	Social consultation	Randgold Resources
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment	Ergo (Pty) Ltd
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	Heritage Impact Assessment	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	Heritage Impact Assessment	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	Heritage Basic Assessment	Ergo (Pty) Ltd
Kibali ESIA Update Project	Orientele Province, Democratic Republic of Congo	2014 2014	Heritage Impact Assessment	Randgold Resources
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014 2014	Palaeontological Assessment	EcoPartners
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014 2014	Heritage Basic Assessment	Sasol Mining
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2015	Heritage Impact Assessment	Aquarius Resources
Oakleaf ESIA Project	Bronkhorstspuit, Gauteng, South Africa	2014 2015	Heritage Impact Assessment	Oakleaf Investment Holdings
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment	ILISO Consulting
Imvula Project	Kriel, Mpumalanga, South Africa	2014 2015	Heritage Impact Assessment	Ixia Coal
Sibanye WRTRP	Gauteng, South Africa	2014 2016	Heritage Impact Assessment	Sibanye
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014 2015	Heritage Impact Assessment	VM Investment Company



Project Title	Project Location	Date:	Description of the Project	Name of Client
NLGM Constructed Wetlands Project	Liberia	2015 2015	Heritage Impact Assessment	Aureus Mining
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015 2015	Section 34 Destruction Permit Applications	Ergo (Pty) Ltd
JMEP II EIA	Botswana	2015 2015	Heritage Impact Assessment	Jindal
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	Bigen Africa Services (Pty) Ltd
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Permit Application	Bigen Africa Services (Pty) Ltd
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Groningen and Inhambane PRA	Limpopo Province, South Africa	2016 2016	Heritage Basic Assessment	Rustenburg Platinum Mines Limited
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014 2016	Technical Review	IMIC plc
Palmietkuilen MRA	Springs, Gauteng, South Africa	2016 2016	Heritage Impact Assessment	Canyon Resources (Pty) Ltd
Copper Sunset Sand Mining S.102	Free State, South Africa	2016 2016	Heritage Basic Assessment	Copper Sunset Sand (Pty) Ltd
Exxaro Belfast GRP	Belfast, Mpumalanga, South Africa	2013 2017	Grave Relocation	Exxaro
Grootvlei MRA	Springs, Gauteng, South Africa	2016 2016	Notification of Intent to Develop	Ergo (Pty) Ltd
Lambda EMP	Mpumalanga, South Africa	2016 2016	Palaeontological Impact Assessment	Eskom Holdings SOC Limited
Kilbarchan Basic Assessment and EMP	Newcastle, KwaZulu-Natal, South Africa	2016 2016	Heritage Basic Assessment	Eskom Holdings SOC Limited
Grootegeeluk Amendment	Lephalale, Limpopo Province, South Africa	2016 2016	Notification of Intent to Develop	Exxaro
Eskom Northern KZN Strengthening	KwaZulu-Natal, South Africa	2016 2017	Heritage Impact Assessment	ILISO Consulting
Garsfontein Township Development	Pretoria, Gauteng, South Africa	2016 2016	Notification of Intent to Develop	Leungo Construction Enterprises



Project Title	Project Location	Date:	Description of the Project	Name of Client
Massawa EIA	Senegal	2016 2017	Technical Reviewer Heritage Impact Assessment	Randgold Resources
Louis Botha Phase 2	Johannesburg, Gauteng, South Africa	2016 2016	Phase 2 Excavations	Royal Haskoning DHV
Beatrix EIA and EMP	Welkom, Free State, South Africa	2016 2017	Heritage Impact Assessment	Sibanye Gold Ltd
Sun City Heritage Mapping	Pilanesberg, North-West Province, South Africa	2016 2016	Phase 2 Mapping	Sun International
Sun City Chair Lift	Pilanesberg, North-West Province, South Africa	2016 2017	Notification of Intent to Develop	Sun International
Hendrina Underground Coal Mine EIA	Hendrina, Mpumalanga, South Africa	2016 2016	Heritage Impact Assessment	Umcebo Mining (Pty) Ltd
Elandsfontein EMP Update	Clewer, Mpumalanga, South Africa	2016 2017	Heritage Impact Assessment	Anker Coal

## 6 Professional Registrations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

## 7 Publications

Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. *Journal of African Archaeology* 9(2): 189-206