



DIGBY WELLS
ENVIRONMENTAL



**Rietfontein Prospecting EMP,
Rietfontein 101IS, 2629AD Bethal,
Mpumalanga Province**

Notification of Intent to Develop

Project Number:

APM2880

Prepared for:

Rustenburg Platinum Mines (Pty) Ltd

October 2014

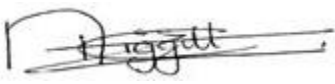


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Report Type:	Notification of Intent to Develop
Project Name:	Rietfontein Prospecting EMP, Rietfontein 101IS, 2629AD Bethal, Mpumalanga Province
Project Code:	APM2880

Name	Responsibility	Signature	Date
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Johan Nel HRM Unit Manager ASAPA membership no: 95	2 nd reviewer		25 September 2014

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EXECUTIVE SUMMARY

This Notification of Intent to Develop (NID) is submitted in accordance with subsections (2) and (8) of section 38 of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA).

Introduction

Digby Wells Environmental (Digby Wells) was appointed by Rustenburg Platinum Mines Limited (RPM), a subsidiary of Anglo American Platinum Limited (AAP) for the compilation and submission of an Environmental Management Plan (EMP) and Consultation Report. The EMP was conducted in support of a Prospecting Right Application (Ref No. MP30//5/1/1/2/11683PR). The Prospecting Right application is for numerous portions, and remaining extents of portions of the farm Rietfontein 101 IS, in the Magisterial District of Bethal. The EMP and associated Public Consultation was compiled in accordance with the requirements of Section 16 of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and Regulations in terms of the MPRDA (GN R. 527 of 23 April 2004). This Heritage study follows the HRM process in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA).

Project Activities

Prospecting activities will be undertaken over a period of five (5) years and the application is for both invasive and non-invasive methods. Invasive methods are activities that result in land disturbances and comprise diamond core drilling, sampling and sample storage. It is anticipated that one (1) borehole, with a cleared area measuring 20 m x 20 m and respective access roads, will be drilled each year and each hole will be rehabilitated immediately after drilling has ended.

Identified Project Activity	Description	Development as defined in NHRA	Trigger for HIA	Sources of risk to heritage resources	Project Phase
Ground clearance for access roads	Ground cover vegetation will be cleared for the construction of access roads	This activity constitutes development as defined in terms of NHRA Section (s) 2(viii) (a) construction, alteration, demolition, removal or change of use of a place or a structure at a place.	s.38 (1) a	Potential destruction and damage to sub-surface heritage resources	Construction
Ground clearance for	A total of five areas measuring 20 m x 20 m each	This activity constitutes development as	s.38 (8)	Potential destruction and	Construction



Identified Project Activity	Description	Development as defined in NHRA	Trigger for HIA	Sources of risk to heritage resources	Project Phase
prospecting drill sites	(total 0.2 ha) will be cleared for prospecting drill sites	defined in terms of NHRA s. 2 (viii) (e) and (f) any change to the natural or existing condition or topography of land; and any removal or destruction of trees, or removal of vegetation or topsoil.		damage to sub-surface heritage resources	

NHRA Section 38 Triggers

The following activities require a Heritage Impact Assessment (HIA) in terms of Section 38 of the NHRA.

NHRA Section 38 (1) Activities / Triggers			Summary description (E.g. 500 m conveyor belt, open cast pit, etc.)
<input checked="" type="checkbox"/>	a	Any linear development or barrier >300 m	Ground clearance for access roads
<input type="checkbox"/>	b	Any bridge or similar structure >50 m	
<input type="checkbox"/>	c	Any development or activity that will change the character of a site:	
	<input type="checkbox"/>	i $\geq 5\ 000\text{m}^2$ in extent	
	<input type="checkbox"/>	ii Involving ≥ 3 existing erven/subdivisions	
	<input type="checkbox"/>	iii Involving ≥ 3 or more erven/divisions consolidated within past 5 years.	
<input type="checkbox"/>	d	Rezoning of a site $\geq 10\ 000\text{m}^2$ in extent.	
<input checked="" type="checkbox"/>	8	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)	MPRDA

Additional Impact Assessment Process

The following impact assessment processes were undertaken for the proposed project.

Legislation, i.e. NEMA, MPRDA, etc.	MPRDA,
Consenting Authority that has/will receive information	Department of Mineral Resources (DMR) and Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET)
Reference Number	MP30//5/1/1/2/11683PR
Present phase of process at Authority, e.g. Draft Scoping Report	Draft Basic Assessment Report

Identified/known heritage resources and potential impacts

The following categories of heritage resources as defined in Section 3 of the NHRA are known to occur within the proposed project area.

<input checked="" type="checkbox"/>	3(2)(a)	Places, buildings, structures and equipment of cultural significance
		<i>Description of resource:</i> On a site specific scale, historical resources are located within the project area
		<i>Potential impact:</i> The historical resources should not be impacted on by prospecting activities
<input type="checkbox"/>	3(2)(b)	Places to which oral traditions are attached or which are associated with living heritage
		<i>Description of resource:</i> Oral traditions of mistreatment of farmworkers
		<i>Potential impact:</i> The oral traditions should not be impacted on by the prospecting activities
<input checked="" type="checkbox"/>	3(2)(c)	Historical settlements and townscapes
		<i>Description of resource:</i> None
		<i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(d)	Landscapes and natural features of cultural significance
		<i>Description of resource:</i> None
		<i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(e)	Geological resources of scientific or cultural importance
		<i>Description of resource:</i> None
		<i>Potential impact:</i> None
<input checked="" type="checkbox"/>	3(2)(f)	Archaeology and/or palaeontology (Including archaeological sites and material, fossils, rock art, battlefields & wrecks)
		<i>Description of resource:</i> On a regional scale, Later Iron Age (LIA) sites have been identified. On a site specific scale the Vryheid formation is present within the project area and a number of Iron Age and Historical sites have been identified within the project area.



		<i>Potential impact:</i> LIA sites located in the region area should experience no impacts. However there may be potential damage or destruction to sub-surface palaeontological heritage resources during prospecting activities.
<input checked="" type="checkbox"/>	3(2)(g)	<p>Graves and burial grounds (e.g.: ancestral graves, graves of victims of conflict, historical graves & cemeteries)</p> <p><i>Description of resource:</i> A historical burial ground was identified within the project</p> <p><i>Potential impact:</i> The burial ground should not be impacted on by prospecting activities</p>
<input type="checkbox"/>	3(2)(a)	<p>Other human remains</p> <p><i>Description of resource:</i> None</p> <p><i>Potential impact:</i> None</p>
<input type="checkbox"/>	3(2)(h)	<p>Sites of significance relating to the history of slavery in South Africa</p> <p><i>Description of resource:</i> None</p> <p><i>Potential impact:</i> None</p>
<input type="checkbox"/>	3(2)(i)	<p>Movable objects</p> <p><i>Description of resource:</i> None</p> <p><i>Potential impact:</i> None</p>

Recommendations

Is a Heritage Impact Assessment required?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>If NO, provide motivation:</p> <p>Prospecting activities will be of a low impact for the project area, therefore the Rietfontein Project should be exempt from further heritage studies.</p> <p>Recommendations for the project include:</p> <ul style="list-style-type: none"> ■ Identified heritage resources must be demarcated; ■ Contractors must be made aware of the heritage resources through their induction; ■ A Watching Brief must be conducted by a qualified archaeologist to monitor ground clearance to ensure no heritage resources are disturbed or damaged; ■ Chance Finds Procedures (CFP's) should also be implemented as part of the EMP to ensure chance finds during clearance are managed correctly; and ■ Should the project progress to a Mining Right Application, an HIA must be conducted for the project area. 		

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Appendix A: CV of Specialists



LIST OF ABBREVIATIONS AND GLOSSARY OF TERMS

ANC	African National Congress
ASAPA	Association of Southern African Archaeologists
AAP	Anglo American Platinum
BA	Bachelor of Arts
CCP	Central Cattle Pattern
CFP's	Chance Find Procedures
ELM	Emalahleni Local Municipality
EMP	Environmental Management Plan
ESA	Early Stone Age
GIS	Geographic Information System
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
IDP	Integrated Development Plan
LA's	Listed Activities
LIA	Late Iron Age
LSA	Later Stone Age
MDEDET	Mpumalanga Department of Economic Development, Environment and Tourism
MPHRA	Mpumalanga Provincial Heritage Resources Authority
MPRDA	Minerals and Petroleum Development Act, 2002 (Act 28 of 2002)
MPRDAB	Mineral and Petroleum Resources Development Amendment Bill, 2013 (Bill 13 of 2013)
MSA	Middle Stone Age
NAAIRS	National Automated Archival Information Retrieval System



NDM	Nkangala District Municipality
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NID	Notification of Intent to Develop
PGMs	Platinum Group Metals
RPM	Rustenburg Platinum Mines
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
Sow	Scope of Work
Stats SA	Statistics South Africa
WITS	University of the Witwatersrand

DECLARATION OF INDEPENDENCE

Digby Wells and Associates (Pty) Ltd

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I, Natasha Higgitt as duly authorised representative of Digby Wells and Associates (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Rustenburg Platinum Mines Limited (RPM) or Anglo American Platinum Limited (AAP), other than fair remuneration for work performed, specifically in connection with the EMP for the proposed Rietfontein Project in the Emalahleni Local Municipality, Mpumalanga Province.



Full name: Natasha Higgitt

Title/ Position: Assistant Heritage Consultant: Archaeology Specialist

Qualification(s): BA Honours specialising in Archaeology

Experience (years): 3 years' experience

Registration: Association of Southern African Professional Archaeologists (ASAPA) No: 335



1 Project background

1.1 Introduction

Digby Wells Environmental (Digby Wells) was appointed by Rustenburg Platinum Mines Limited (RPM), a subsidiary of Anglo American Platinum Limited (AAP) for the compilation and submission of an Environmental Management Plan (EMP) and Consultation Report. The EMP was conducted in support of a Prospecting Right Application (Ref No. MP30//5/1/1/2/11683PR). The Prospecting Right Application is for numerous portions of the farm Rietfontein 101 IS in the Magisterial District of Bethal. The EMP and associated Public Consultation was compiled in accordance with the requirements of Section (s) 16 of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and Regulations in terms of the MPRDA (GN R. 527 of 23 April 2004). This Heritage study follows the Heritage Resources Management (HRM) process in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA).

1.2 Terms of Reference

RPM has requested Digby Wells to complete an EMP in support of the Prospecting Right Application inclusive of relevant specialist studies.

1.3 Scope of Work

The required HRM process was inclusive of a Notification of Intent to Develop (NID) that was informed by baseline information. The Scope of Work (SoW) included:

- Gather baseline information to provide heritage and historical context for the project area;
- Review of available heritage studies completed in the project area;
- Completing historical layering for the project area; and
- Collating information into an NID report including recommendations for any additional heritage studies, if deemed necessary.

1.4 Project Description

The prospecting activities will take place on Rietfontein 101 IS portions 1-5 and remaining extent (See Table 1-1 for location details).

Prospecting activities will be undertaken over a period of five (5) years. The application is for both invasive and non-invasive methods, these are described separately below:

- Invasive methods are activities that result in land disturbances and comprise diamond core drilling, sampling and sample storage;
- Non-invasive methods are methods that do not cause disturbances to the land and include desktop research and detailed geophysical surveys.



It is anticipated that one (1) borehole will be drilled each year and each hole will be rehabilitated immediately after drilling has ended. Each borehole will comprise of a cleared area measuring 20 m x 20 m and respective access roads. Minerals that would be prospected for include Platinum Group Metals (PGMs) (palladium, rhodium, iridium, osmium and platinum), gold, copper, nickel, cobalt, silver and chrome.

Table 1-1: Location Data

Province	Mpumalanga Province
Magisterial District / Local Authority	Bethal Magisterial District
District Municipality	Nkangala District Municipality (NDM)
Local municipality	Emalahleni Local Municipality (ELM)
Nearest Town	Kriel (8 km), Kinross (18 km), Bethal (24 km)
Property Name and Number	Rietfontein 101 IS
1: 50 000 Map Sheet	2629AC Evander
GPS Co-ordinates	-26.344939
(relative centre point of study area)	29.252819

1.5 Project Activities

Expected project activities associated with the proposed Rietfontein Project are listed in Table 1-2 below.

Table 1-2: Expected project activities

Activity	NHRA Trigger	Description
Ground clearance	s. 38 (1) a	Access roads will be cleared for prospecting activities
Prospecting	s. 38 (8)	A total of five prospecting boreholes will be drilled over five years
Rehabilitation of drill sites	n/a	Prospecting drill sites will be rehabilitated upon completion of the borehole

1.6 Client, Consultant and Landowner Contact Details

Contact details for the RPM and Digby Wells project managers, and relevant landowners are provided in Table 1-3 to Table 1-5 below.

Table 1-3: Rietfontein project manager contact details

Company	Rustenburg Platinum Mines (RPM)
Contact person	Barry Jones



Tel no	083 484 9925
E-mail address	Barry.jones@angloamerican.com

Table 1-4: Digby Wells project manager contact details

Company	Digby Wells Environmental
Contact person	Duncan Pettit
Tel no	011 789 9495
Fax no	011 789 9498
E-mail address	duncan.pettit@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 1-5: Landowner contact details (Owner of Rietfontein 101IS, Portion 1-5 and Re)

Directly Affected Portions	Landowners	Telephone no.	Postal address
Rietfontein 101 Portion 1 & 2	Anglo Operations (Pty) Ltd (Dirk Kitching)	(013) 6915685	n/a
Rietfontein 101 Portion 3, 4, 5	Karen Breytenbach	(011) 313 3911	PO Box 40111, Moreleta Park, 0044
Rietfontein 101 Portion 3, 4, 5	Mr Johannes Cornelius Greyling	(011) 445 7748	PO Box 40111, Moreleta Park, 0044

1.7 Expertise of Specialists

The following specialists provided input for the NID for the Rietfontein Project:

Natasha Higgitt has obtained her Bachelor of Arts (BA) with majors in Archaeology and Geography in 2008, and a BA Honours degree in Archaeology in 2010 from the University of Pretoria. She currently holds the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than three years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia. Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (Member No: 335)

The curriculum vita of the specialist is attached as Appendix A.



2 Policy and Legal Framework

The NHRA is the overarching legislation that protects heritage resources and regulates their management. The HRM process completed for the Rietfontein Project was done in accordance with s. 38(8), where impacts on heritage are assessed in terms of other legislation – the MPRDA in this instance.

2.1 MPRDA

The MPRDA stipulates under s. 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

Furthermore, the Mineral and Petroleum Resources Development Amendment Bill, 2013 (Bill 13 of 2013) (MPRDAB) stipulates under s. 16 that “any person who wishes to apply to the Minister for a prospecting right, must simultaneously apply for an environmental authorisation”.

2.2 NHRA

The HRM approach developed and implemented by Digby Wells is founded on s. 38(1) and 38(2) of the NHRA. These sections of the Act require that Heritage Resources Authorities (HRA's), in this case the South African Heritage Resources Agency (SAHRA) and Mpumalanga Provincial Heritage Resources Authority (MPRHA), be notified as early as possible of any developments that may exceed certain minimum thresholds. The heritage specialist is required to provide SAHRA and MPRHA with sufficient information regarding the proposed development in order to determine whether a comprehensive Heritage Impact Assessment (HIA) is required. SAHRA and MPRHA should respond within 14 days whether or not a HIA is required, and if required should state which specialist studies should be included.

The NHRA furthermore affords general and formal protection of certain categories of heritage resources, including:

- Formal protection:
 - National and provincial heritage sites under s. 27;
 - Certain types of protected areas under s. 28; and
 - Heritage areas under s. 32.
- General protection:
 - Certain structures under s. 34;
 - Archaeological and palaeontological resources, and meteorites under s. 35;



- Certain categories of burial grounds and graves under s. 36; and
- All public monuments and memorial under s. 37.

Any activity that will result in the change of the status quo of any heritage resources protected in terms of the above sections of the Act may, must be considered as a *permitted activity*. Changes to such resources will therefore require authorisation through permits issued by either SAHRA or MPRHA.

3 HRM methodology

3.1 Definition of the study areas

Given that no individual identified heritage resource can exist in isolation to the wider natural, social, cultural and heritage landscape, three concentric study areas were defined for the purposes of this study. Defining these 'zones of influence' had a two-fold purpose:

- First, it provided the context within which identified heritage resources need to be interpreted and understood to determine cultural significance; and
- Second, assessing the significance of impacts on heritage resources corresponding to the three impact categories listed above.

The three zones of influence are as follows:

The Tertiary Zone of Influence (also referred to as the *regional* study area): This area was defined as the district municipality. 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, depicted in Figure 3-1 also provided the regional development and planning context that may contribute to cumulative impacts.

The Secondary Zone of Influence (also referred to as *local* study area): This area was defined as the immediate surrounding properties / farms, as well as the affected local municipality. The local study area was specifically examined to provide 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. The local study area is depicted in Figure 3-2.

Primary Zone of Influence (also referred to as the *site-specific* study area): This area was defined as the bounded project area i.e. the farm portions, within which the development will physically intrude through the construction of project infrastructure and project-related activities. The affected farm portions are listed in Table 1-1 and the site-specific study area depicted in Figure 3-3.

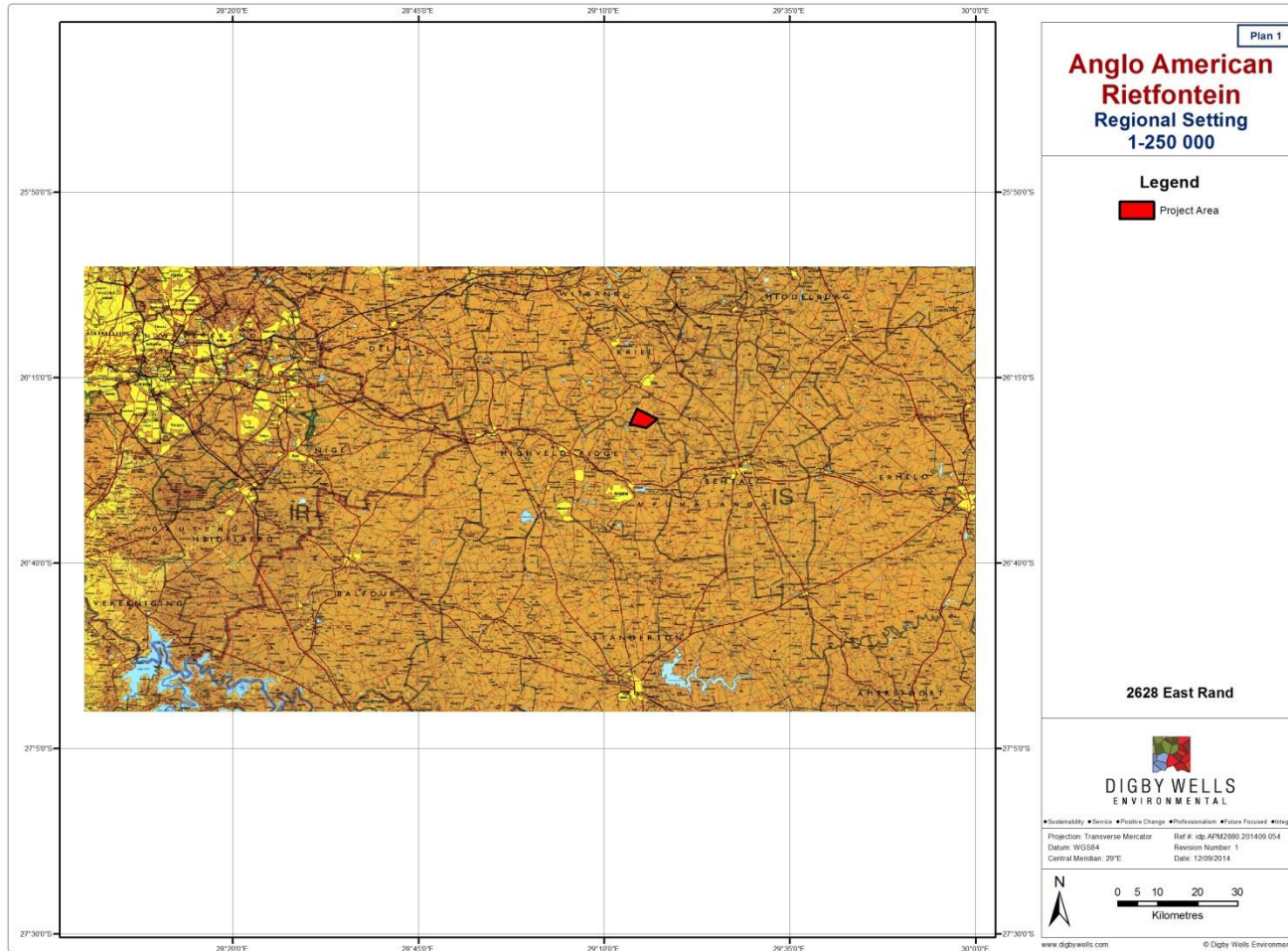


Figure 3-1: Regional Study Area of the Rietfontein Project

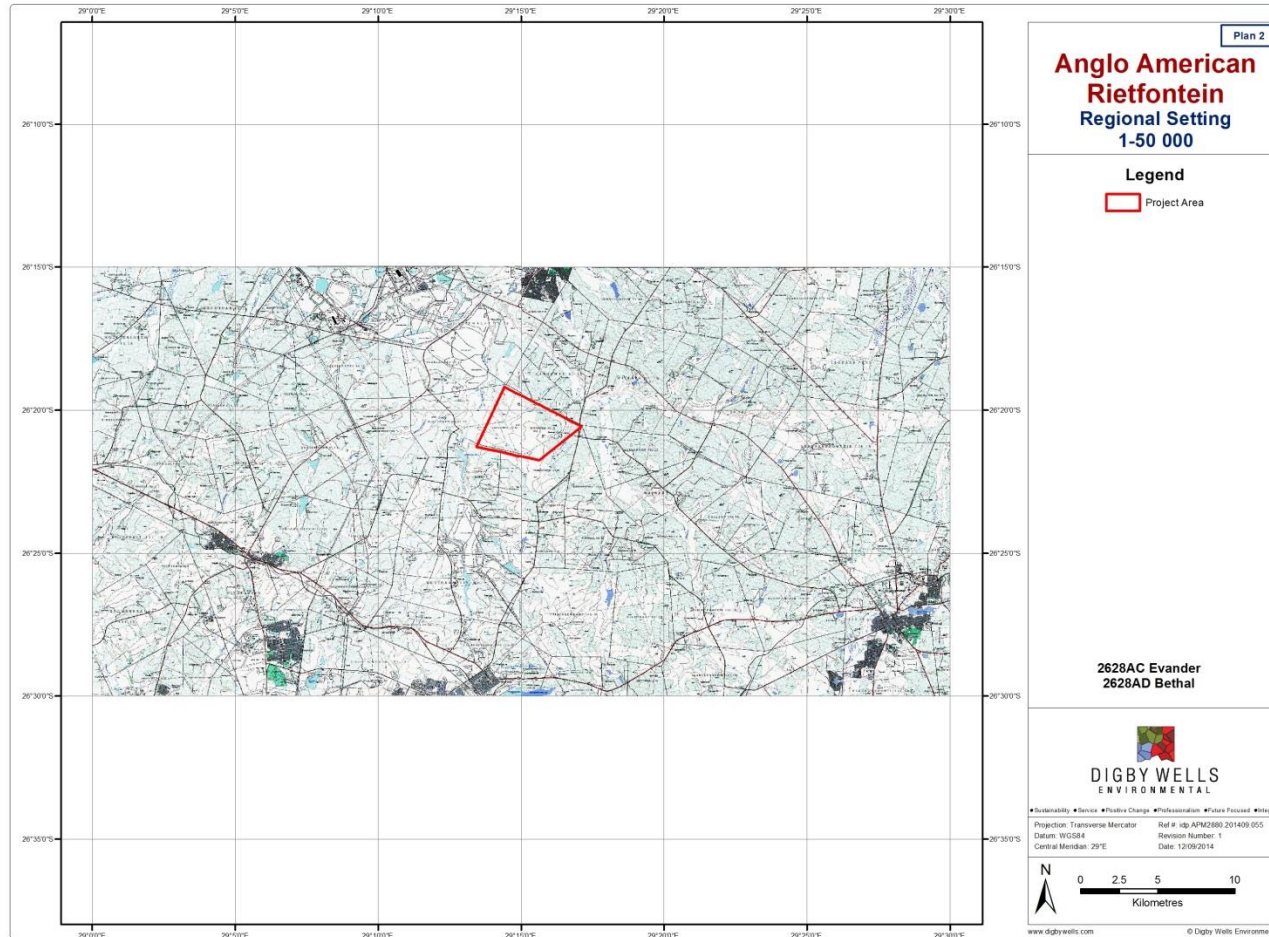


Figure 3-2: Local Study Area of the Rietfontein Project

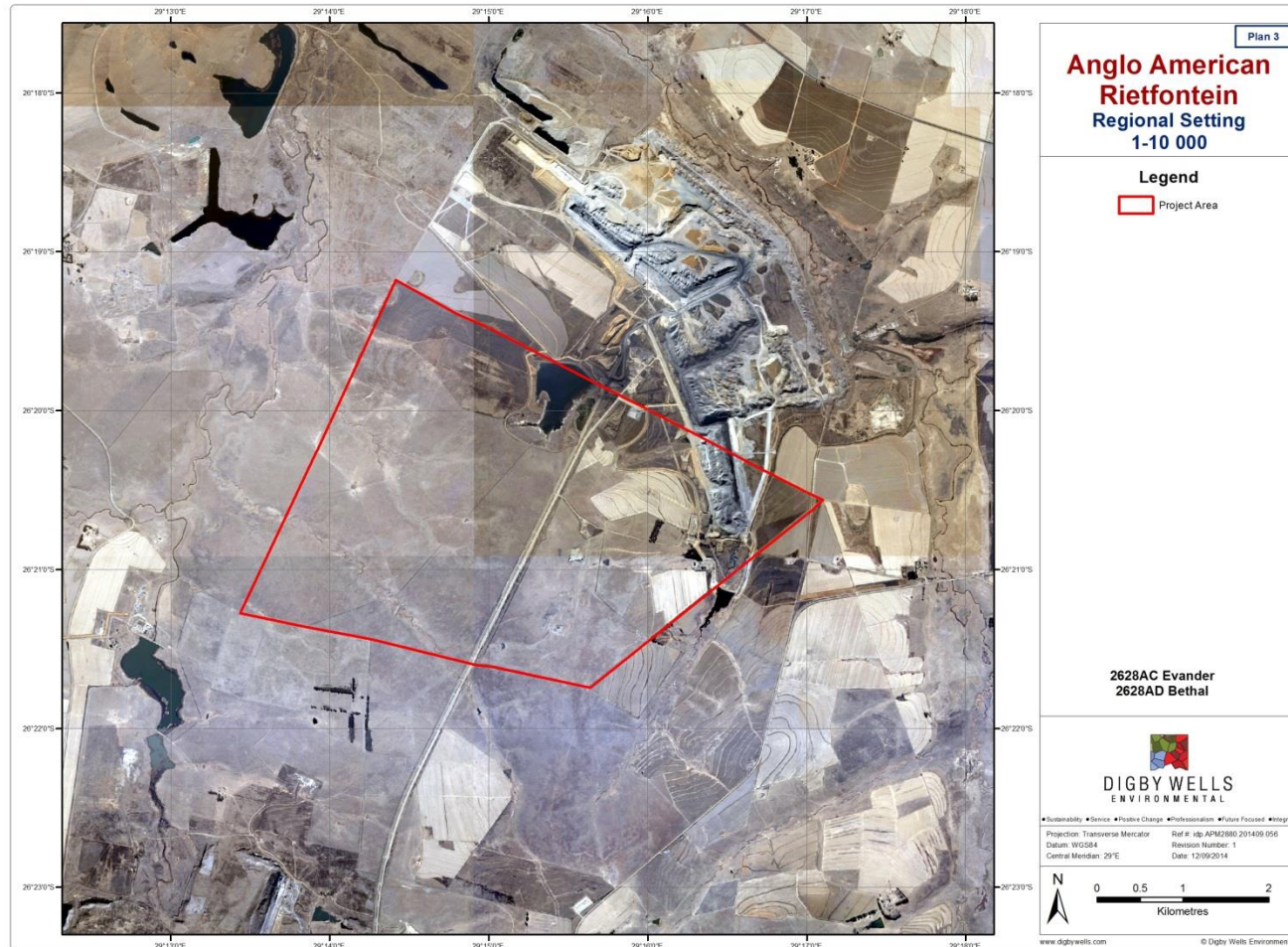


Figure 3-3: Site Specific Study Area of the Rietfontein Project



3.2 Data Collection

3.2.1 Desktop and Text-Based Data Collection

Data collection was aimed at information gathering relating to known heritage resources within and surrounding the proposed area for development. Information was obtained through intensive research using a variety of primary and secondary sources such as academic journals, textbooks and records, national and provincial websites, archaeological field guides, national guidelines, maps, photographs and plans.

Published literature including academic papers, books and planning documents were collated and analysed to determine their relevance to this NID. Sources that were used to inform the findings are fully referenced under Section 7 of this report, and are briefly listed in below.

Table 3-1: Relevant reviewed published sources

Palaeontology	<ul style="list-style-type: none"> ■ Bamford, 2011; ■ Council for GeoScience, 2014; ■ Lavin, 2013;and ■ Plumstead, 1962.
Stone Age	<ul style="list-style-type: none"> ■ Deacon & Deacon, 1999; ■ Esterhuysen & Smith, 2007; ■ Korsman & Plug, 1994; ■ Potgieter, 1955; and ■ Turner & Wadley, 1987.
Iron Age	<ul style="list-style-type: none"> ■ Huffman, 2007; ■ Maggs, 1976; ■ Maggs, 2008; and ■ Makhura, 2007.
Historical and Colonial Period	<ul style="list-style-type: none"> ■ Britannica, 2014; ■ Holden & Mathabatha, 2007; and ■ Raper, 1987.
Planning documents	<ul style="list-style-type: none"> ■ Emalahleni Local Municipality, 2014/15.
General	<ul style="list-style-type: none"> ■ Mucina & Rutherford, 2006; and ■ Statistics South Africa, Local Municipality, 2011.

Previously completed heritage studies that were conducted in the surrounding areas were reviewed to expand on the background information discussed. The findings provide



evidence-based inferences to be made with regard to the potential for, and description of heritage resources that are likely to occur in the project region. Heritage cases and reports found to be relevant are listed in Table 3-2 below, and fully referenced under Section 7.

Table 3-2: Relevant reviewed heritage studies

Author	Report type	Area / property / project
van Schalkwyk, 2003	Scoping Report	Kriel Mine Extension
Van Schalkwyk, 2003	AIA	Bethal Region

An archive and database survey was conducted by consulting the following repositories:

- National Automated Archival Information Retrieval System (NAAIRS);
- Statistics South Africa (Stats SA)
- South African Heritage Resources Information System (SAHRIS); and
- The University of the Witwatersrand (WITS) Archaeology Site Database.

3.3 Historical Layering

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.

Cartographic sources referred to in this report include are listed in Table 3-3.

Table 3-3: Cartographic sources relevant to the Rietfontein project

Historical maps						
Map series		Name / number		Date		
Major Jackson		Bethal Sheet 27		June 1902		
Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
340	009	16465	2629	Bethal	1954	1954/340
548	008	00968	2629 2630	Bethal	1968	1968/548



750	005	00175	2628 2629	Bethal	1975	1975/750
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3.4 Site Naming

Sites may be identified based on previous relevant reports. The relevant SAHRA report number will be followed by the relevant heritage resource type suffixed with the site name and / or number that was used in the original reports. For example, a heritage resource identified in Roodt (1999) described as an Iron Age site and numbered Site 1 in that report will be: **1999-SAHRA-0021/IA Site 1**

This number may be shortened on any plans or maps to the site number used in that report.

If the SAHRA report number is unavailable, the author and date of the report will be followed by the reference to the relevant heritage resources type suffixed with the site name and/or number that was used in the original reports. For example, **Roodt-1999/IA Site 1**

Sites identified during field surveys are prefixed by the SAHRIS case number assigned to the study followed by the map sheet number, relevant heritage resources type and site number. For example: **6392/2629AC/IA-001**

This number may be shortened on any plans or maps to the relevant heritage resources type suffixed with the site number used in that report. For example: **IA-001**

3.5 Constraints and Limitations

The following restrictions and limitations were encountered:

- No site screening visit was completed due to site access constraints.

4 Cultural Heritage Baseline Description

4.1 Introduction

The cultural heritage baseline consists of several periods in the history of the regional, local and site specific areas within and surrounding the Rietfontein Project area. These periods are discussed to provide context for any identified heritage within and around the project so as to better assess their significance and the level of impact caused by the proposed project. The following time periods are discussed in this cultural heritage baseline (See Table 4-1).

Table 4-1: List of periods forming part of cultural heritage baseline

1 Palaeontological and geological
Precambrian to late Pleistocene (1.2 billion to late 20 000 years ago)
2 Indigenous
Early Stone Age (3 million to 300 00ya) (ESA)



Middle Stone Age (c 300 000 to 30 000 ya) (MSA)
Later Stone Age (c 30 000 to 2000 ya) (LSA)
Late Iron Age (1500's to 1850's) (LIA)
3 Colonial
British colony (1814 -1910)
4 Historical
Union of South Africa (1911-1961)

4.2 Regional Study Area

4.2.1 Stone Age

The Stone Age is represented by the presence of ESA, MSA and LSA sites throughout the Mpumalanga-Highveld region. The ESA can be dated between ± 2 Million years BP and 250 000 years BP is defined by the occurrence of large hand axes and cleavers produced from coarse-grained material (Esterhuysen & Smith, 2007). The MSA is characterised by the presence of blades and points manufactured from good quality raw material dated to between ± 250 000 years to ± 20 000 years BP. Bone tools, shell beads and pendants, as well as the use of ochre are also present in the MSA (Deacon & Deacon, 1999). The LSA lithic assemblage contains microlithic technology and composite tools like bows and arrows and can be dated to approximately 20 000 years BP. The LSA shows strong signs of ritual practises and complex societies, as well as rock art. Herders or pastoralists emerge towards the end of the LSA, with ceramics and domesticated stock (Deacon & Deacon, 1999).

The Highveld region of Mpumalanga is scattered with surface occurrences of Stone Age material with little evidence of *in situ* deposit. One may find *in situ* deposit within caves and shelters where LSA material and rock art are usually evident. Examples of such sites include Bushman Rock Shelter (150 km south-east from the project area) that shows evidence of a long occupation sequence that dates back to 26 000-14 000 years ago. Both MSA and LSA tools are present, bone tools and beads made from ostrich eggshell, land snail and bone (Plug 1981). Approximately 75 km north-east from the project area, lies the Honingklip Shelter, which has examples of rock art and LSA remains such as scrapers, adzes and awls, and other artefacts such as beads and Early Iron Age potsherds (Korsman & Plug, 1994). Other areas where LSA artefacts may be found are around the many natural pans that are spread across the Highveld region, such as the Chrissiesmeer area. Bushmen have been recorded to have lived on and around pans in the Chrissiesmeer region, approximately 50 km north from the project area (Potgieter, 1955).

4.2.2 Iron Age

The Stone Age is followed by the Iron Age in southern Africa. This period consists of the Early, Middle and Late Iron Ages (LIA) and follows the spread of Bantu speaking people.



LIA sites are found within the Mpumalanga region. A key indicator of LIA sites is the presence of stone-walled settlements. Stone-walled settlement patterns can be divided into two primary clusters known as the Moor Park and Ntsuanatsatsi within the main Central Cattle Pattern (CCP) (Huffman, 2007), summarised in Table 4-2 below.

Table 4-2: Stone walling clusters associated with the CCP

Central Cattle Pattern			
Moor Park Cluster		Ntsuanatsatsi Cluster	
Moor Park	14 th -16 th Century	Type N	15 th -17 th Century
Melora	16 th Century - ?	Badfontein	16 th Century
KwaMaza	18 th Century – Historic	Doornspruit	19 th Century
		Klipriviersberg	19 th Century
		Type V	19 th Century
		Molokwane	19 th Century
		Type Z	19 th Century
		Type B	19 th Century
		Tukela	19 th Century

A sub-group of the Moor Park Cluster is that of the KwaMaza settlement pattern. This is commonly found throughout Mpumalanga, and consists of characteristics such as beehive huts, cattle kraals, a central court, and a side chamber for a small court (Huffman, 2007). Another settlement pattern found in the region is the Type V settlement pattern. This type consists of the standard core of cattle enclosures surrounded by beehive huts. Additionally, it is believed that it is also within this type corbelled huts evolved (Maggs, 1976)

Another settlement type the Badfontein type associated with the baKoni group. The baKoni had circular settlements that consist of cattle lanes and terrace walls (Huffman, 2007). The baKoni chiefdom lies in a corridor that extends from Ohrigstad to Carolina with several branches heading out the Komati Valley and some sections of the Crocodile river, with a small cluster to the west of the Steelpoort Valley (Maggs, 2008).

Associated artefacts with the stone walled settlements are the material culture of the people who once occupied the site, which would be the ceramics. Artefacts that are commonly found in once occupied Iron Age sites are the ceramic material culture that was used in everyday life, both functionally for storage and cooking, and for ritual purposes.

Through a process of ceramic typology, it is possible to trace Iron Age groups based on the decoration of the ceramics (Huffman, 2007). The more common ceramic found in Mpumalanga are summarised in Table 4-3.


Table 4-3: Common ceramic found in Mpumalanga

Facies	Period	Key Characteristics
Mzonjani	450 BC - 750 BC	Punctates on rim, spaced motif on shoulder
Uitkomst	1650 BC – 1820 BC	Stamped arcades, appliqué and blocks of parallel incisions, stamping and chord impressions
Rooiberg	1650 BC – 1750 BC	Stamped rim band, mixture of stamped and incised bands, arcades and triangles in the neck
Icon	1300 BC – 1500 BC	Multiple incised bands separated by colour and lip decorations on bowls
Madikwe	1500 BC – 1700 BC	Multiple bands of cord impressions, incisions, stabs and punctates separated by colour
Diamant	750 BC – 1000 BC	Tapered rims with broadly incised herringbone
Eiland	1000 BC – 1300 BC	Fine herringbone with ladder stamping
Letaba	1600 BC – 1840 BC	Hatched bands on shoulder, below black and red triangles
Doornkop	750 BC – 1000 BC	Multiple herringbone bands in neck
Klingbeil	1000 BC – 1200 BC	Triangles in neck bordered with slashes, punctates on shoulder

4.2.3 Colonial and Historical Period

The Mpumalanga region experienced a great deal of chaos and turmoil of groups during the 18th and 19th centuries due to the *Mfecane*. The *Mfecane* was a period of significant population movement and displacement of interior groups as the Zulu Kingdom expanded. As a result of the unrest, large settlements of the Bantu-speakers are uncommon and refuge sites are evident as groups could not settle permanently (Makhura, 2007).

The Boers or Afrikaans farmers began to move into the interior during the latter part of the 19th century. As the Bantu-speakers were displaced due to the *Mfecane*, the Boers believed they were moving into uninhabited areas and began to claim large portions of lands for themselves. They began to exploit the natural resources of the interior and gained a strong foothold in areas (Makhura, 2007).

4.3 Local Study Area

4.3.1 Geology and Palaeontology

The project area falls within the *Vryheid Formation*. This formation consists of deltaic mudstones and sandstones with occasional coal seams (Lavin, 2013). Fossil plants are the predominant palaeontological resources that have been found in this region of South Africa. The fossil plants that have previously been recorded include lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers and ginkgoaleans (Bamford,



2011). Other fossils that are expected to occur include trace fossils, rare insects, possible conchostracans, non-marine bivalves and fish scales (Lavin, 2013).

Fossil plants such as *Breytenia* were identified approximately 46 km east in similar sandstone ridges during the palaeontological field survey for the Msobo Coal (Pty) Ltd Consbrey Colliery (SAHRIS Case ID: 1722). Previously, only one other specimen was recorded in the 1950's by Edna Plumstead and therefore any subsequent finds of this fossil plant would be highly valued (Plumstead, 1962).

According to the PalaeoSensitivity map on SAHRIS, the project area falls within a very high, moderate and low sensitivity zone (Council for GeoScience, 2014) (See Figure 4-1). However, as the project area is located within a coal field, the high palaeo-sensitivity is inherent.

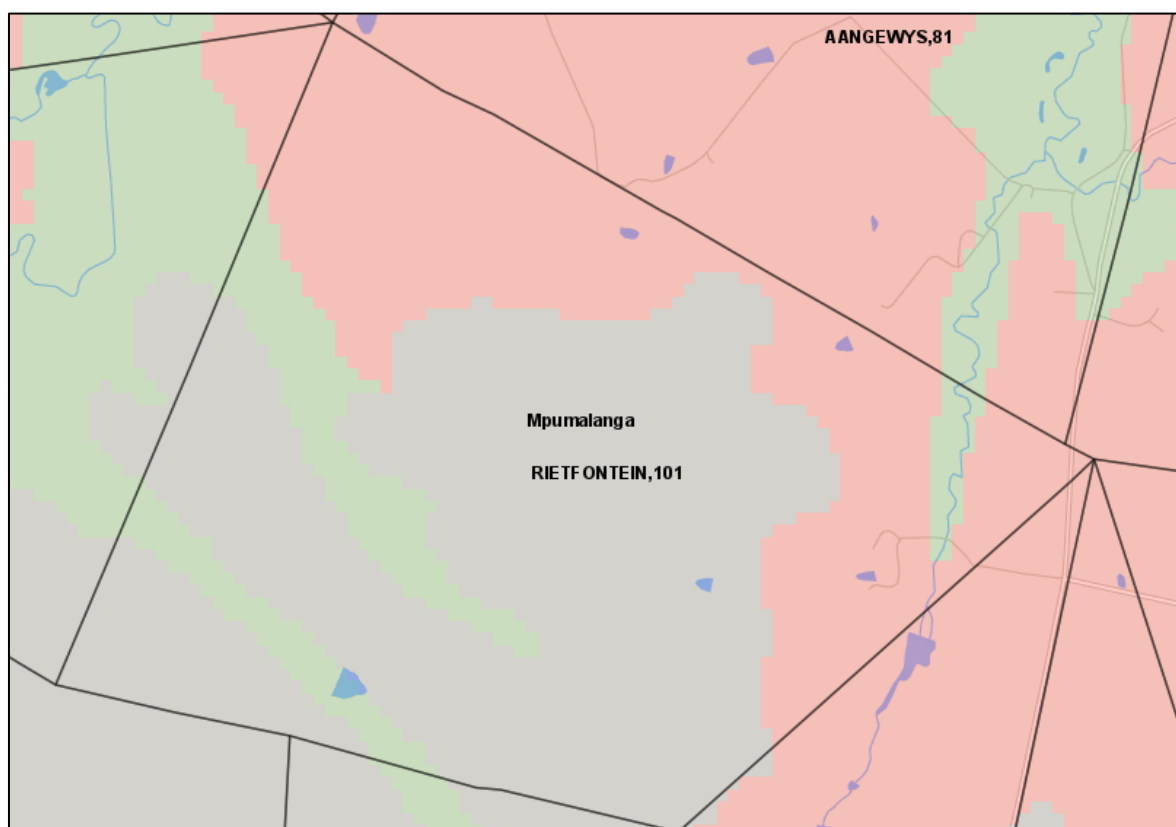


Figure 4-1: Palaeo-Sensitivity map of the study area, with the approximate extent of the Rietfontein Project area (adapted from SAHRIS, 2014). Areas that are shaded pink indicate a very high palaeo-sensitivity, while green is moderate and blue is of a low sensitivity.

4.3.2 Stone Age

In Mpumalanga, the majority of Stone Age sites are identified as surface scatters and within shelters (Esterhuysen & Smith, 2007). According to van Schalkwyk (2003a), numerous MSA



and LSA surface occurrences are evident in the surrounding areas such as the areas around Kriel. The sites that he identified are surface scatters and out of context as they are eroding out of dongas and riverbeds.

Three substantial LSA sites are located in the local study area. These include Hope Hill Shelter, Leslie Falls Shelter and Horos Cave approximately 32 km west from the project area (Turner & Wadley, 1987). These shelters were occupied approximately 4 400 years before present, with small informal assemblages of LSA stone lithics and some bone points and link shafts. The sites were most probably used as hunting camps on a seasonal basis.

4.3.3 Iron Age

As stated in section 4.2.2, Type V stone-walled settlements and other settlement patterns associated with the baKoni are to be expected in the surrounding study areas. The baKoni corridor is located approximately 50 km east of the project area.

Three Type V settlements have been recorded between 8 km and 16 km of the project area (van Schalkwyk, 2003a; Van Schalkwyk, 2003b).

4.3.4 Colonial and Historical Period

The towns closest to the project area include Bethal, Kinross and Kriel. Kriel (also known as Ga-Nala) was established in 1973 to house the workers at the Kriel Power Station. The town grew substantially from 1982 to 1989 and was declared a municipality in 1990 (Emalahleni Local Municipality, 2014/15). Kinross was proclaimed as a village in 1915, and gained municipal status in 1965. The town was established due to the construction of the Springs-Breyten rail route (Raper, 1987).

Bethal is the oldest of the towns near the project area. It was established in 1880 on the farm Blessbokspruit and was named after the wives of the owners of that farm (Elizabeth du Plooy and Alida Naude) (Raper, 1987). The town started to expand once the rail route from Springs to the coast was built. The presence of the railway, increased trade and development and gained municipal status by 1921 (Govan Mbeki Local Municipality, 2013).

During the 1940's, the farms surrounding Bethal were investigated due to allegations of mistreatment of farmworkers. The story was investigated between 1947 and 1959 by Ruth First and assisted by Gert Sibande. Gert went undercover to uncover the truth (Holden & Mathabatha, 2007). The story came to a tipping point, when in August 1959; the ANC planned a massive boycott of the farms around Bethal. This was known as the "Potato Boycott" and it lasted for two months. It served as an inspiration for resistance movement against the Apartheid government. (Holden & Mathabatha, 2007).

4.3.5 Development Context

The development and planning context in which the proposed Rietfontein Project will operate was summarised from the following sources:



- Stats SA (Statistics South Africa, 2011); and
- ELM Draft Integrated Development Plan (IDP) 2014/14.

The ELM covers an area of approximately 2 677 km². The total population is estimated at 395 466 with a density of 148 persons per square kilometre (Statistics South Africa, 2011). A total of 138 548 of the population is economically active and 20.6 % of the economically active population is employed in the mining sector (Emalahleni Local Municipality, 2014/15). Income levels of the economically active population are depicted in Table 4-4.

Table 4-4: Average monthly household income for the ELM (Statistics South Africa, 2011)

Income	Percentage
No income	13,5%
R1 - R4,800	3,2%
R4,801 - R9,600	5%
R9,601 - R19,600	11,1%
R19,601 - R38,200	16,8%
R38,201 - R76,400	17,5%
R76,401 - R153,800	13,5%
R153,801 - R307,600	10,5%
R307,601 - R614,400	6,1%
R614,001 - R1,228,800	2%
R1,228,801 - R2,457,600	0,5%
R2,457,601+	0,3%

The average annual household income in the ELM shows that the largest percentage of the economically active population (53.6 %) is earning less than R 76 400.00 per year, while 13.5 % of the population does not earn an income.

According to the ELM IDP, the mining sector is the largest potential contributor to the economy of the municipality to stimulate economic growth in 2009 with 49.8% (Emalahleni Local Municipality, 2014/15). The challenges of environmental degradation and pollution associated with a high amount of mining projects in the municipality were highlighted in the



IDP and there was a call for special focus on the green economy (Emalahleni Local Municipality, 2014/15).

The ELM IDP does state that there are numerous heritage sites located within the municipal area that are currently under threat due to the rapid rate of development. The industrial heritage of the municipality is also recognised citing the many power stations as heritage resources (Emalahleni Local Municipality, 2014/15).

While the ELM is developing at an increasing rate, with mining at the forefront of the expansion, there is a need for balance between industrial projects and more environmentally friendly projects, as well as the protection of heritage resources such as power stations.

4.4 Site-Specific Study Area

According to (van Schalkwyk, 2003a), there appears to be a number of Iron Age sites within the project area, however it is unclear of the exact location of the sites as no coordinates were supplied. The estimated location of the project area in relation to these possible sites is depicted in Figure 4-2 below (Iron Age Sites are depicted in red). Please refer to Figure 4-7 for all identified heritage resources within the Rietfontein Project area.

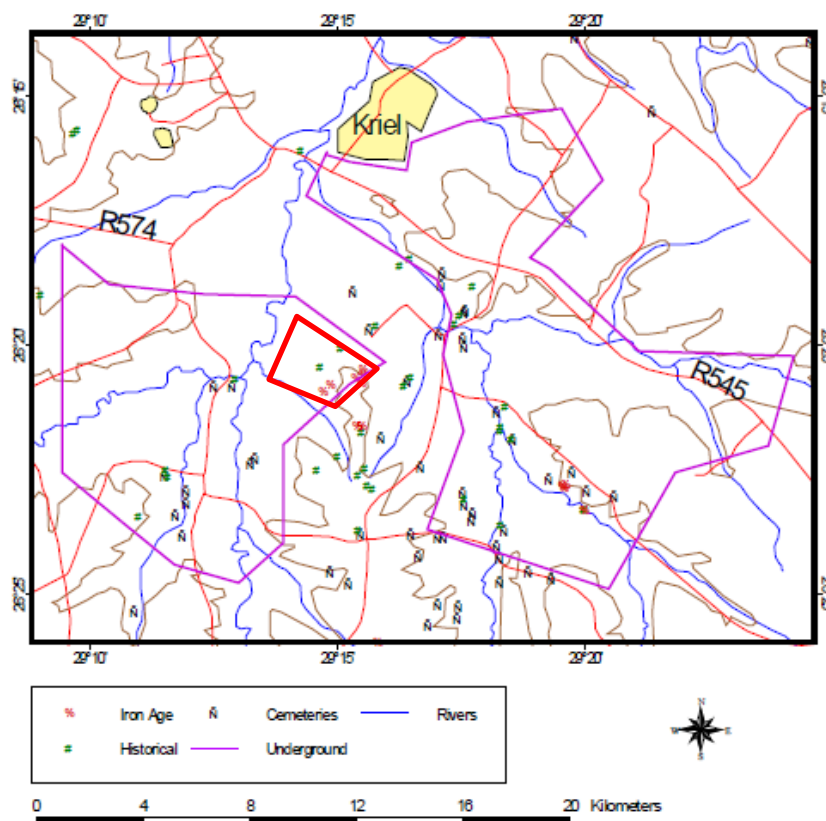


Figure 4-2: Identified Heritage Resources within the Rietfontein Project area in red (van Schalkwyk, 2003)



In 1902, the farm Rietfontein was known as Rietfontein 63. A small group of structures is present in the eastern corner of the farm adjacent a historical main road (See Figure 4-3).

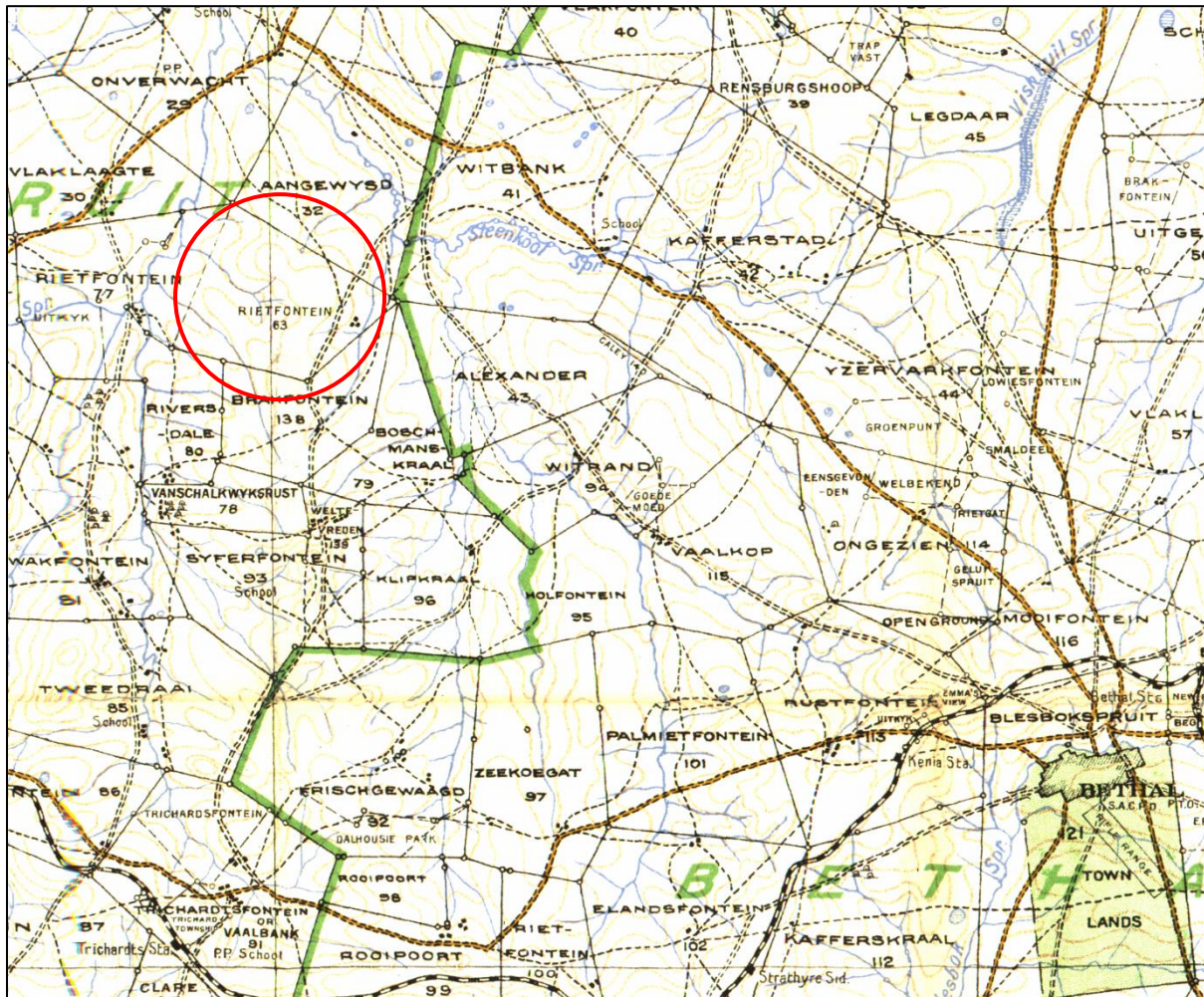


Figure 4-3: 1902 view of the Rietfontein Project area (Major Jackson Sheet 27)

Historical layering spanning from 1954 to 1975 shows a gradual change in the area surrounding the proposed Rietfontein Project. The area has been dominated by agricultural activities from the 1950's until the 1970's, however the project area has remained relatively unchanged since 1954. Structures were identified on the 1954, 1968 and 1975 historical imagery. A wind break running south-south west from the large home stead is present in 1954; however it has been removed by 1968 (See Figure 4-4, Figure 4-5 and Figure 4-6).



Figure 4-4: 1954 historical imagery of the Rietfontein project (The yellow rings indicate identified structures)



Figure 4-5: 1968 historical imagery of the Rietfontein project

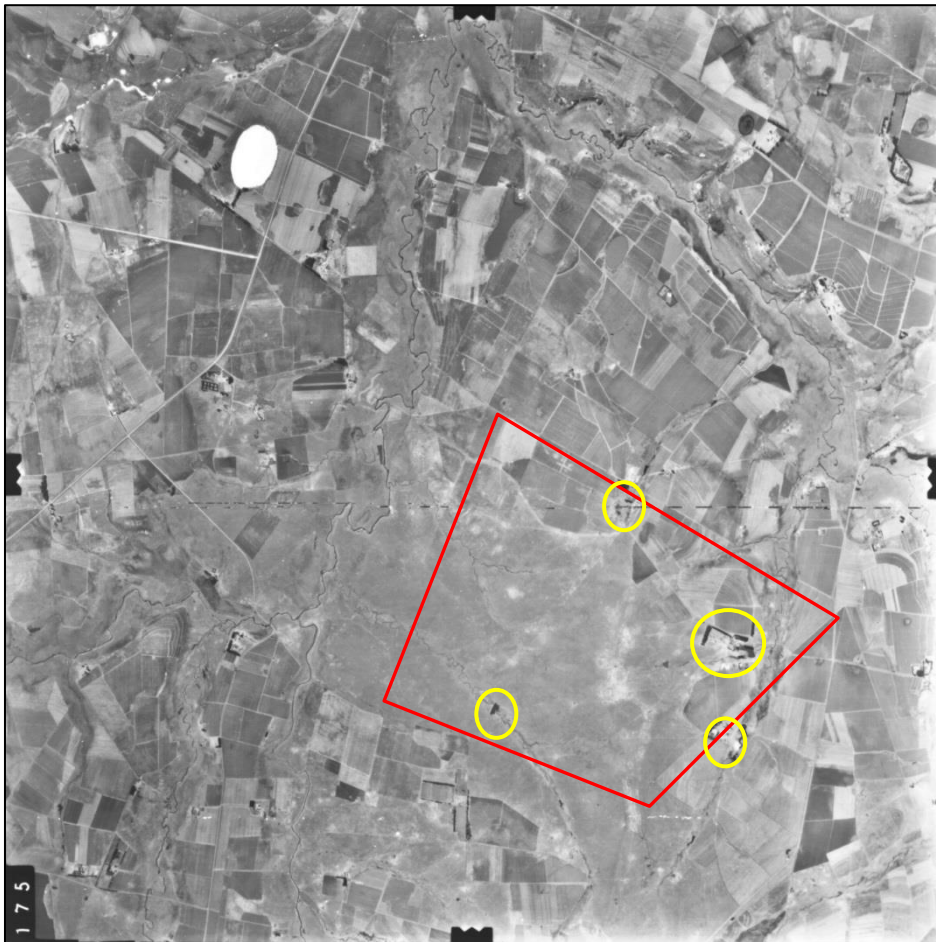


Figure 4-6: 1975 historical imagery of the Rietfontein Project

Historical resources were identified by van Schalkwyk (2003a) as shown in Figure 4-2 above. These include historical structures (depicted in green) and one historical burial ground (depicted with a black icon). Please refer to Figure 4-7 for all identified heritage resources within the Rietfontein Project area.

The latest aerial imagery (2012) of the project area is depicted in Figure 4-7 below. The historical structure and burial ground located to the north of the project area as depicted in Figure 4-6 is no longer in existence. The main farmstead appears to be intact; however, the remaining heritage sites in the eastern corner identified by van Schalkwyk (2003a) may no longer be present due to mining activities.

A road and conveyor belt runs through the middle of the project area, however, the majority of the project area is undisturbed. The proposed positions of the prospecting drill points are not in close proximity to the identified heritage resources (See Figure 4-7 below).

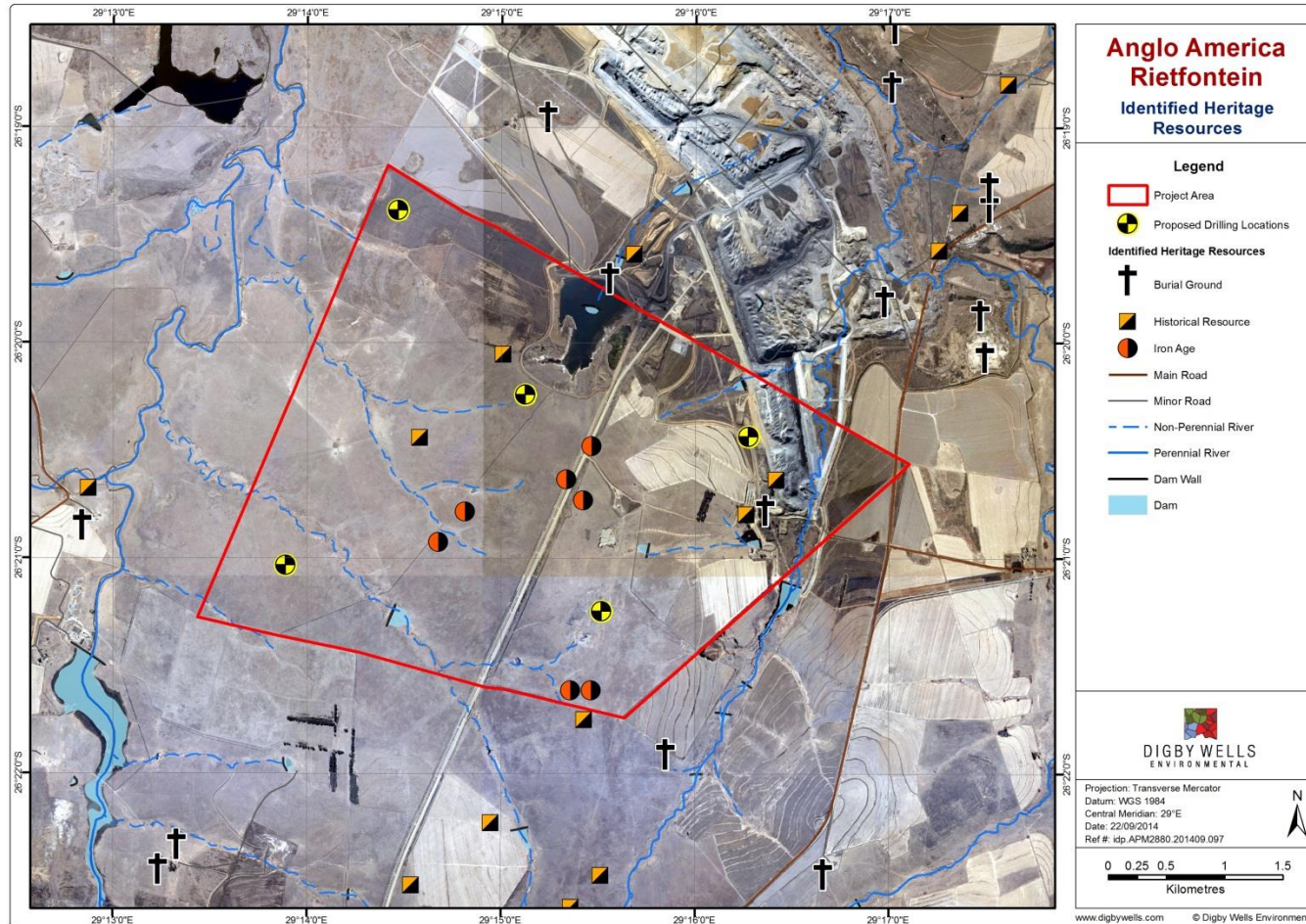


Figure 4-7: Identified heritage resources within the Rietfontein Project area Summary

5 Summary of Impacts / Sources of Risk

Sources of risk were determined considering the project activities that may impact on heritage resources (See Table 5-1).

Table 5-1: Identified sources of risk

Identified Project Activity	Description	Development as defined in NHRA	Trigger for HIA	Sources of risk to heritage resources	Project Phase
Ground clearance for access roads	Ground cover vegetation will be cleared for the construction of access roads	This activity constitutes development as defined in terms of NHRA s. 2(viii) (a) construction, alteration, demolition, removal or change of use of a place or a structure at a place.	s.38 (1) a	Potential destruction and damage to sub-surface heritage resources	Construction
Ground clearance for prospecting drill sites	A total of five areas measuring 20 m x 20 m each (total 0.2 ha) will be cleared for prospecting drill sites	This activity constitutes development as defined in terms of NHRA s. 2 (viii) (e) and (f) any change to the natural or existing condition or topography of land; and any removal or destruction of trees, or removal of vegetation or topsoil.	s.38 (8)	Potential destruction and damage to sub-surface heritage resources	Construction



5.1 Ground clearance phase

As the proposed project activities are to be of a low impact, no direct impact is expected during the construction phase. However, un-identified and sub-surface heritage resources may be directly impacted upon. The highest likelihood of negative impacts on un-identified and sub-surface heritage resources to occur is associated with activities that will be undertaken during construction phase of the proposed project.

For the Rietfontein Project, project activities identified as sources of risk during construction include:

- Ground clearance for the access roads and drill sites.

Ground clearance and excavation for the construction of the access roads and prospecting drill sites may disturb or damage any sub-surface heritage resources. However, excavations may uncover bedrock or rocky outcrops that may contain palaeontological resources. In this instance, they may be a positive impact as the excavation may identify unknown fossil heritage in the area.

5.2 Drilling Phase

During the operational phase of the proposed project, sources of risk to heritage resources are limited. The primary risk during the operational phase will be associated with the indirect impacts that may occur due to accidental damage or vandalism.

5.3 Rehabilitation Phase

No sources of risk to heritage resources are envisaged for the decommissioning phase of the project.

5.4 Cumulative Impacts

Some cumulative impacts that may occur include:

- The cumulative effect of site clearance will over time create a cumulative area of 1 ha i.e. 0.2 ha x 5;
- Another significant cumulative impact is the increased presence over time of contractors. Therefore there is a higher potential of accidental damage or deliberate vandalism to tangible heritage resources, including historical structures that are unoccupied, burial grounds etc.



6 Conclusion and Recommendations

Based on the findings of this report, heritage resources are present within the Rietfontein project area. These include Iron Age sites, historical structures and burial grounds. However, the proposed positions of the boreholes and the relative low intensity of the prospecting activities will not significantly impact on heritage resources and direct impact on any heritage resources can be avoided.

Digby Wells is therefore of the opinion that RPM be exempted from all additional heritage assessments for the Rietfontein Project provided that the following mitigation and management measures are included in the EMP and implemented:

- Identified heritage resources must be clearly demarcated and avoided during the prospecting phase by the following measures:
 - Burial grounds and graves, historical structures and Iron Age sites must be given a buffer of 50 m to ensure no accidental damage occurs;
 - RPM must ensure that contractors are made aware of the heritage through training that must be included in their induction and contractors pack.
- A Watching Brief must be implemented when drill sites are prepared and access routes to such sites are created.
 - This entails the on-site supervision of a qualified archaeologist during ground clearance for access roads and drill sites to ensure no heritage resources are accidentally damaged; and
- Chance Finds Procedures (CFP's) must be compiled and implemented as part of the EMP to be followed in the event that any heritage resources are identified during any site clearance and when access routes are created;
- When prospecting is completed and RPM wishes to apply for a Mining Right and Environmental Approval, an HIA must be completed. The HIA should include:
 - An Archaeological Impact Assessment;
 - A Built Heritage Assessment; and
 - NHRA Regulations Chapter XI consultation regarding burial grounds.



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Notification of Intent to Develop

Rietfontein Prospecting EMP, Rietfontein 101IS, 2629AD Bethal, Mpumalanga Province

APM2880



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ENVIRONMENTAL

Appendix A: CV of Specialists

Notification of Intent to Develop

Rietfontein Prospecting EMP, Rietfontein 101IS, 2629AD Bethal, Mpumalanga Province

APM2880



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