mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Environmental Management Plan

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF SECTION 39 AND OF REGULATION 52 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002, (ACT NO. 28 OF 2002) (THE ACT)

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Prospecting EMP Report**
Project Name:	**Prospecting Environmental Management Plan Report for Mawetse (SA) Mining Corporation (Pty) Ltd**
Project Code:	**MMC3745**

Name	Responsibility	Signature	Date
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STANDARD DIRECTIVE

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) directed to submit an Environmental Management Plan (EMP) strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED

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LIST OF ABBREVIATIONS AND ACRONYMS

BIC	Bushveld Igneous Complex
BID	Background Information Document
BPEP	Best Possible Environmental Practices
CBA	Critical Biodiversity Area
CEC	Cation Exchange Capacity
CR	Critically Endangered
dB	Decibels
Digby Wells	Digby Wells Environmental
DMR	Department of Mineral Resources
DRE	Design Rainfall Estimation
DWS	Department of Water and Sanitation (previously the Department of Water Affairs, DWA)
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EN	Endangered
ESA	Ecological Support Areas
GMLM	Greater Tubatse Local Municipality
ha	Hectares
HIV/Aids	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
HSR	Heritage Statement Report
HSS	Heritage Screening Survey
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan

IUCN	International Union for Conservation of Nature
LSA	Late Stone Age
MAE	Mean Annual Evaporation
mamsl	Metres above mean sea level
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NT	Near Threatened
PGM	Platinum Group Metals
PP	Public Participation
PRECIS	National Herbarium Pretoria Computerised Information System
PWP	Prospecting Works Programme
QDS	Quarter Degree Square
SABAP	Second Southern African Bird Atlas Project
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information Service
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Services
SIA	Social Impact Assessment
TDS	Total Dissolved Solids
VU	Vulnerable
WARMS	Water Users Registration Management Systems
WMA	Water Management Area
WR2005	Water Resources of South Africa 2005

1 Regulation 52 (2): Description of the Environment Likely to be affected by the Proposed Prospecting or Mining Operation

1.1 The Environment on Site Relative to the Environment in the Surrounding Area

Mawetse (SA) Mining Corporation (Pty) Ltd (Maweste SA) has applied for a Prospecting Right (PRA), of the minerals Chrome ore; Copper; Gemstone; Vanadium; and Andalusite, which was accepted by the Department of Mineral Resources (DMR) on 27 October 2009 under Reference No. LP30/5/1/1/2/2530 PR for the farms as listed in Table 1-1 below.

Table 1-1: Farms Included in the Prospecting Right Application

Farm	Portion Numbers
Farm Mooihoek 255 KT	1, 2, 3, 4, 5, 6, 7, 8, and Remaining Extent (RE)
Farm Driekop 253 KT	The Farm

This Environmental Management Plan (EMP) is compiled in terms of Section 39 and Regulation 52 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)[1]. Refer to Appendix A for the Regulation 2(2) Plan indicating the area included in the Prospecting Right area.

The proposed prospecting area is located on the farms Mooihoek 255KT and Driekop 253KT within the Driekop area approximately 13km north-west of Steelpoort. The farms are located on the south eastern region of the Limpopo Province. The farm Driekop 253KT is joined to the north-western corner of Mooihoek 255KT. Refer to Appendix A for the Regional and Local setting Plan.

The proposed prospecting area falls within the Greater Tubatse Local Municipality (GTLM), which is located in the Greater Sekhukhune District Municipality (GSDM), Limpopo Province. The total surface area to which the Prospecting Right applies measures 7104.37 hectares (ha).

This section provides a socio-economic and environmental baseline of the likely affected environment.

[1] Since the application preceded the coming into force of the Mineral and Petroleum Resources Development Amendment Act, 2008, and the Environmental Impact Assessment Regulations, 2014 published in terms of the Environmental Management Act, 1998, as amended, the Regulations under the MPRDA apply to this EMP.

1.1.1 Socio-Economic Baseline Profile

1.1.1.1 Project Area

The proposed prospecting area (defined in this report as the "site specific area") covers Wards 7, 8, 10, 11, 12, 17 and 19 of the GTLM, which is part of the GSDM. The prospecting site is intersected from the southeast by the R37 road which runs between the towns of Burgersfort and Lebowakgomo.

Ward 7 appears to be the more densely populated ward, with several villages situated in the area of the Mooihoek 255KT farm. These villages include Ragopola (in the eastern part of the prospecting area) and Driekop (towards the south). Ward 2, to the south of the prospecting area, is mostly occupied by commercial farming and mining. The town of Burgersfort is situated about 16 km to the southeast of the project site. It is a rapidly growing town that serves the surrounding mining community and is largely characterised by heavy engineering enterprises, suppliers to the mines, transport facilities, building material suppliers, distributors/wholesale, medium density housing and a small retail component.

1.1.1.2 Population

The area surrounding the prospecting right boundary occupies a total surface of approximately 82 square kilometres (km^2). Of this area, about 40 km^2 (or 48%) is occupied by settlements comprising the villages mentioned above. The estimated total population of the site specific wards is approximately 18 065 households. These settlements are surrounded by subsistence agricultural fields; these occupy roughly 10% of the project area (see Figure 1-1).

1.1.1.3 Political Structures

The villages in the prospecting area are situated on communal land within legally recognised traditional authorities governed by chiefs and their respective tribal councils. It should be noted, however, that the boundaries between traditional authorities' areas of jurisdiction are not always well-defined, as households paying allegiance to different traditional authorities are sometimes interspersed.

The population of the site specific area (which is defined above as the prospecting area) is therefore subject to two parallel systems of governance: the statutory system (consisting of ward committees, ward councillors, local municipality, etc.) and a customary system (consisting of chiefs, tribal councils, etc.). The ward committees consist of elected members who function as the link between the community and the local municipality, with the latter being responsible for service delivery, development planning and other, related functions. The duties of tribal councils to some extent overlap with those of the ward councils; their responsibilities include dealing with conflicts in the community, presiding over customary court cases, allocating stands to community members, and coordinating development efforts in the community.

Other community-based structures present in the project area include farming committees, a home-based care committee, youth leagues for respective political organisations, church committees, traditional dance committees and governing bodies at the schools. Being in a relatively rural area, many people in the project area attach considerable importance to their cultural traditions, and tribal authorities are held in high regard. However, with a significant influx of people who have migrated into the prospecting area in search of employment at the nearby mines, this trend has begun to show some changes in recent years.

1.1.1.4 Regional Socio-Economic Structure

This section provides socio-economic baseline information on the GTLM area, which forms the regional backdrop of the proposed project. The municipality was established on 5 December 2000 as part of the Sekhukhune District Municipality. It comprises part of the former Lebowakgomo homeland, and is mainly rural in nature. The surface area of the Greater Tubatse Local Municipality is approximately 229 000 ha.

The nearest urbanised settlements are Steelpoort (about 15 km to the south of the project site) and Burgersfort (about 16 km to the Southeast). The local municipality consists of 29 wards. There are currently 15 mines in the Greater Tubatse area, with several more being planned. Other economic activities include agriculture and a nascent tourism industry (ITS Engineers, 2007).

1.1.1.5 Demographics

There are approximately 270 000 people and 54 000 households living in the Greater Tubatse area, the population of the prospecting area 74 500 people residing in 18 065 households (Stats SA, 2013). The population of Tubatse contributes about 28% of the total population of the Sekhukhune District Municipality. Ninety-nine per cent (99%) of the population is Black African, and 1% White; this is also the case at site specific ward level. The average number of people living in one household (under one roof) is 4.72 and in the site specific area the number of people in one household is 4.1. An estimated 7% of the population (19 000 people) stay in 11 traditional villages in Tubatse. In general, people living in this area live in poverty, with approximately 19 people financially dependent on one income earner (GTLM, 2014).

The population growth rate is estimated to be approximately 3.4% per annum. Taking into consideration the impact of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) on the population growth rates, however, it is expected that population rates are slowing, and that the population might start to decline in the near future (GTLM, 2014).

Of the population of the local municipality, 91% speak Sepedi, 4% Swazi and 2 % Tsonga. Overall, women represent 54% of the total Greater Tubatse population and men 46%. However, the gender distribution varies between age groups. In the site specific area, 92% speak Sepedi with other 8% speaking English, IsiNdebele, IsiXhosa, IsiZulu, Sesotho, Setswana, Swati and Tsonga. In the pre- and school-going age group male and female

representation is equal (50/50). In the “working-years” age group, however, there are more females (59%) and fewer males (41%). At site specific level, this trend continues with 51.2% being female and 48.8% being male. This can be attributed to the fact that men leave their homes to go and work in the cities (Stats SA, 2013).

1.1.1.6 Education and Health

Twenty-two per cent (22%) of the population in Tubatse that is 20 years and older has had no form of education or schooling. There are 246 educational institutions in Tubatse, including 70 primary schools, 55 secondary schools, 115 combined primary and secondary schools, four farm schools and two higher education institutions (GTLM, 2014). There is approximately one educator for every 36 primary school learners in Tubatse and one educator for every 34 secondary school learners. At the site specific level, 57% of the population had attended secondary school but only 1% of the population had completed it with 1% having gone on to higher education (Stats SA, 2013).

There are four hospitals in the Greater Tubatse Local Municipality. Together the four hospitals have 376 beds. There are approximately 416 people working in these facilities of which 45% (186) is medical personnel and 55% administrative. In 2005 there were nine mobile clinics and five vehicles and 15 medical personnel who work in these mobile clinics in Tubatse (GTLM, 2014).

1.1.1.7 Employment and Income

Of the municipal population 66% is not economically active (does not work/does not look for work), 21% are unemployed while 13% have employment. Most of the people who are employed work within the Government sector (27%), where they mostly provide services within the health and social development sectors. Mining employs approximately 20% of the employed people, while agriculture accounts for about 12% of employment (GTLM, 2014).

Only approximately 1 295 individuals in the GTLM earn more than R6 400 per month, with the average income between R1 and R2 400 per month. At site specific level only 16% of households earn more than R76 400 per annum suggesting that as much as 84% of the site specific population live in poverty. Economic indicators support the conclusion that the area is poor and rural (Stats SA, 2013).

1.1.1.8 Housing and Basic Services

Seventy-three per cent (73%) of the dwellings in Tubatse are formal and in the site specific area, this comes to 84%. Traditional dwellings (huts) account for 18% but only 3% in the site specific area. The traditional dwellings are mostly located in the eleven rural villages. Informal dwelling account for 9% in the Tubatse and 13% in the site specific area (Stats SA, 2013).

Tubatse residents depend mainly on communal stands and the river for water: 32% of households use natural water sources such as rivers and dams, this is as much 38% in the site specific area while 51% of households have basic access to water supplies such as the

water vendor and communal taps in the Tubatse area and 57% in the site specific area. Of the households in Tubatse 13% have intermediate access to water with water inside their premises, and only 4% of households have full access to water. The Integrated Development Plan of the local municipality stresses the issues around the dangers of inadequate water supplies and the necessity for the provision of clean water (GTLM, 2014).

Of the households in the local municipal area, 47% use electricity for lighting, 47% use candles and 5% use paraffin. In the site specific study area, this is substantially more with 82% making use of electricity for lighting. Most households in Tubatse make use of a pit latrine; 25% of households have no sanitation. Only 5% of the households have flush toilets (Stats SA, 2013).

1.1.2 Climate

The Water Resources Manual of South Africa (WR2005, 2012) was used to obtain rainfall and evaporation data described in the sections below.

1.1.2.1 Rainfall

The study area falls primarily within the B41J and B71E quaternary catchments, (WR2005, 2012). The corresponding monthly rainfall for the mentioned quaternary catchment is summarised in Table 1-2 below.

Table 1-2: Monthly rainfall for the study area

Month	Monthly Rainfall (mm)	
	B41J	**B71E**
January	141.4	118.5
February	124.3	93.8
March	98.1	80.3
April	46.5	44.4
May	16.1	15.7
June	11.1	6.6
July	9.9	5.5
August	7.7	6.1
September	22.4	21.9
October	58.2	63.8
November	114.9	118.8
December	131.6	115.6
TOTAL	**782**	**691**

From Table 1-2, it can be seen that the MAP for the B41J and B71E quaternary catchments is 782 mm and 691 mm respectively, with the wettest months occurring from November to January, and the driest months from June to August in both catchments.

1.1.2.2 Evaporation

The evaporation obtained from the WR2005 manual/database is based on Symons Pan evaporation measurements and needs to be converted to Lake Evaporation. This is due to the Symons pan being located below the ground surface, and painted black which results in the temperature in the water being higher than of a natural open water body. The Symons pan is then multiplied by a lake evaporation factor to obtain the adopted lake evaporation. Table 1-3 and Table 1-4 provide a summary of the evaporation figures for the B41J and B71E quaternary catchments where the project site is located.

Table 1-3: Monthly evaporation for the B41J quaternary catchment

Month	Symonds Pan Evaporation (mm)	Evaporation Factor	Lake Evaporation (mm)
January	170.7	0.84	143.4
February	142.3	0.88	125.2
March	140.5	0.88	123.6
April	108.0	0.88	95.1
May	90.9	0.87	79.1
June	73.9	0.85	62.8
July	80.9	0.83	67.1
August	107.1	0.81	86.7
September	138.7	0.81	112.4
October	167.3	0.81	135.5
November	157.8	0.82	129.4
December	173.8	0.83	144.3
TOTAL	**1552**	**N/A**	**1305**

From Table 1-3 it can be seen that the MAE for the study area is 1 305 mm, with the highest monthly evaporation occurring from October to January, whilst during May to July lower monthly evaporation is observed.

Table 1-4: Monthly evaporation for the B71E quaternary catchment

Month	Symonds Pan Evaporation (mm)	Evaporation Factor	Lake Evaporation (mm)
January	169.3	0.84	142.2
February	145.4	0.88	127.9
March	142.7	0.88	125.6
April	114.8	0.88	101.1
May	99.3	0.87	86.4
June	79.9	0.85	67.9
July	88.8	0.83	73.7
August	120.6	0.81	97.7
September	155.9	0.81	126.3
October	183.6	0.81	148.8
November	173.1	0.82	141.9
December	176.6	0.83	146.5
TOTAL	**1650**	**N/A**	**1386**

1.1.2.3 Temperature and Wind

Wind and temperature was obtained from the Loclim programme (FAO, 2005). The method selected to obtain the wind and the temperature data is based on the nearest neighbour method for which the user defines the search radius and number of stations selected. Table 1-5 is the output from the Loclim programme showing the summary of the temperature and wind speed data representative of the project site, which is based on interpolation from a maximum of 10 nearest stations.

Table 1-5: Temperature and wind speed for the study area

Month	Average Temperature (ºC)	Minimum Temperature (ºC)	Maximum Temperature (ºC)	Average Wind Speed (km/hour)
January	20	14.3	26.1	6.48
February	19.7	14.3	23.8	6.48
March	18.7	13.3	24.3	6.12
April	16.7	10	24.3	5.4
May	13.5	5.5	22.2	6.12
June	11	2.2	20	7.2
July	10.8	2.7	20	7.2

Month	Average Temperature (ºC)	Minimum Temperature (ºC)	Maximum Temperature (ºC)	Average Wind Speed (km/hour)
August	13.1	4.4	22.2	7.92
September	15.6	7.8	24.3	9.72
October	18	10.6	25.5	9.72
November	18.7	12.8	25.5	9.72
December	19.7	13.8	26.1	7.92

1.1.2.4 Water Use

The Water Authorisation Registration and Management System (WARMS) is a national register of water users that assists the Department of Water and Sanitation (DWS) with billing and provides valuable information on how much water is being used by different registered water users. Information pertaining to surface water uses for quaternary catchments B71E and and B41J was received from DWS and is summarised in Table 1-6.

Table 1-6: Summary of surface water uses for Quaternary Catchments B71E and B41J

Quaternary Catchment	Registered Water Use	No. of Registered Users	Registered Volumes (m^3/year)	Sources of Water Used
B71E	Agriculture: Irrigation	3	61 190	Borehole
B71E	Mining	5	398 256	River / stream and Borehole
B41J	Agriculture: Irrigation	6	877 096.7	River / stream and Borehole
B41J	Industry (Urban &Non-Urban)	27	3 986 418.1	River / stream Borehole and Dam
B41J	Mining	33	5 887106	River / stream Borehole and Dam
B41J	Water Supply Service	1	730	Borehole

Table 1-6 indicates that mining uses most of the water in the B71E quaternary catchment while irrigation only relies on boreholes; there are obviously unregistered users that also uses water from various natural sources within the catchment.

In B41J, industries are the ones with the highest registered use followed by mining activities.

1.1.3 Land Types, Land Capability and Recommended Land Use Option

1.1.3.1 Land Uses

The proposed prospecting area covers Wards 7, 8, 10,11,12,17 and 19 of the Greater Tubatse Local Municipality. The main land uses of these wards are commercial farming and mining. There are occasional farm houses scattered on the proposed farm boundaries and it was noted, during the site visit, that the houses were occupied with farm workers. Surrounding the prospecting area are towns such as Burgersfort and Steelpoort which mainly serve the surrounding mining community. They are largely characterised by heavy engineering enterprises, suppliers to the mines, transport facilities, building material suppliers, distributors/wholesale, medium density housing and a small retail component.

1.1.3.2 Land Types and Land Capabilities

The land types vary greatly, the overall geomorphology of the area having a marked influence on soil forming process and resultant pedogenisis of the area. The variation in lithologies and the associated differences in geochemistry and the geophysics of the parent materials are the primary influences on the soils and land capability of the study area.

The soils vary in depth, structure and overall texture across the site, with shallow to very shallow and rocky soils associated with the steeper and mountainous terrain, while deeper materials are more prevalent in the valley bottoms and riverine areas associated with the colluvial and alluvial environments.

The impact of development and/or disturbance of these land types and the effects on the ecosystem services and land capability will vary depending on the soil chemistry, texture (clay content) and structure. The more sensitive materials are generally associated with the shallow soils that occur on the steeper terrain, with erosion and the loss of the resource considered of a high negative significance. These soils are considered important to the long term sustainability of the ecosystems and overall biodiversity of the area and any loss of materials in these areas will inevitably have a negative impact on the water resources in an already stressed and arid environment (sedimentation of rivers and dams).

The lower midslopes and valley bottom environments are considered less sensitive in terms of their erosion index, but are generally of a higher rating in terms of their ecosystem services with deeper and more productive soils, better water holding capabilities and better effective rooting depths.

Impacts on these materials will definitely have a negative effect on the subsistence farming and grazing land uses that are common in the area.

1.1.4 Surface Water

1.1.4.1 Baseline Hydrology

This section provides the hydrological baseline description of the project area. These include descriptions of the Water Management Areas rivers and drainage, climate (rainfall and evaporation), and water quality status within or around the project area.

1.1.4.2 Regional Hydrology

South Africa is divided into 19 Water Management Areas (WMA) (National Water Resource Strategy, 2004), managed by their own water boards. Each of the WMAs is made up of quaternary catchments which relate to the drainage regions of South Africa, ranging from A – X (excluding O). These drainage regions are subdivided into four known divisions based on size. For example, the letter A represents the primary drainage catchment; A2 for example will represent the secondary catchment; A21 represents the tertiary catchment and A21D would represent the quaternary catchment which is the lowest subdivision in the Water Resources of South Africa 2005 (WR2005) manual. Each of the quaternary catchments has associated hydrological parameters.

The project area is located within the Olifants WMA 04 and lies between the catchment divide within the B41J and B71E quaternary catchments.

The surface water attributes of the affected catchments namely Mean Annual Runoff (MAR), Mean Annual Precipitation (MAP) and Mean Annual Evaporation (MAE) were obtained from WR2005 study and are summarised in Table 1-7.

Table 1-7: Summary of the surface water attributes of the A41E quaternary catchment

Catchment	Area (km^2)	Rainfall Zone	MAP (mm)	MAR $m^3 * 10^6$	MAE (mm)	Evaporation Zone
B41J	691	B4B	598	13.3	1552	4A
B71E	782	B7A	591	11.3	1650	1A

The B41J quaternary catchment has a net area of 691 km^2, and has an MAR of 13.3 million cubic meters (Mm^3). Runoff emanating from this quaternary catchment drains in a south-easterly direction via streams and drainage lines towards the Steelpoort River which is tributary to the Olifants River.

Other non-perennial rivers within the B41J quaternary include Moopetsi, Tubatsane, and Hudupong. These rivers are tributaries to the Steelpoort River. The Limpopo River is the only perennial river associated with this quaternary catchment.

The B71E quaternary catchment has a net area of 782 km^2, and has an MAR of 11.3 Mm^3. Runoff emanating from this quaternary catchment drains in a north-easterly direction through various streams that reports into the Olifants River.

Streams including Motse, Moopetsi North and Mabongwane River report into the Olifants River.

Moopetsi North traverses in the middle of the prospecting area. However, the closest proposed prospecting borehole is located approximately 600 metres away from the stream.

1.1.5 Surface Water Quality

Surface water quality data was accessed from the DWS. Four surface water monitoring points chemistry data were compared to the SANS: 241 (2015), the World Health Organisation (WHO) and the South African Water Guidelines (Domestic use, 1996).

According to the South African Water Guidelines (Domestic use, 1996), one of the four monitoring points were analysed and found to be unacceptable for domestic usage based on the magnesium concentration.

The magnesium concentration of three of the monitoring points is analysed to be tolerable level. Calcium concentrations in all the monitoring points accessed were measured to be of acceptable level; while monitoring point 1000009844 has a concentration of electrical conductivity (EC) analysed to be of an acceptable level. None of the monitoring points that were sampled indicated the determinants above the standards of SANS 241 (2015) and the WHO.

Table 1-8: Monitoring points data compared to South African Water Guideline (1996)

Monitoring station no	Ideal	Units	pH	EC (mS/m)	Ca	Mg	Na	Cl	SO4
		pH units	>5 <9	<70	32	30	<100	<100	<200
	Acceptable	mg/l	5-9, 9.50-10.00	70-150	32-80	30-50	100-200	100-200	200-400
	Tolerable	mg/l	4.5-4, 10-10.5	150-370		50-70	200-400	200-600	400-600
	Unacceptable	mg/l	<4 >10.5	>370	>80	>70	>400	>600	>600
90479			8.5	67.0	34.8	39.9	48.9	44.9	45.7
1000009844			8.4	95.0	24.0	116.8	51.7	64.1	15.7
1000009845			8.3	63.5	34.2	40.6	36.8	45.7	51.9
192537			8.0	68.5	41.7	41.4	54.8	62.6	69.1

Table 1-9: Monitoring points data (in mg/l) compared to SANS: 241 (2015)

	pH Value at 25° C	EC in mS/m	TALK as CaCO3	Cl	SO4	F	Ca	Mg	Na	K
SANS241:2015 Acute health	**N/S**	**N/S**	**N/S**	**N/S**	**500**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**
SANS241:2015 Chronic health	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**	**1.5**	**N/S**	**N/S**	**N/S**	**N/S**
SANS241:2015 Aesthetic	**N/S**	**170**	**N/S**	**300**	**250**	**N/S**	**N/S**	**N/S**	**200**	**N/S**
SANS241:2015 Operational	**5-9.7**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**	**N/S**
WHO Standard	**6.5<8.5**	**N/S**	**N/S**	**250**	**250**	**1.5**	**N/S**	**N/S**	**200**	**N/S**
90479	8.52	67.00	244.30	44.90	45.70	0.17	34.80	39.90	48.90	0.94
1000009844	8.43	95.00	410.74	64.12	15.74	0.11	24.00	116.80	51.65	2.99
1000009845	8.29	63.50	205.41	45.71	51.92	0.15	34.19	40.56	36.77	1.61
192537	8.02	68.50	178.39	62.62	69.11	0.45	41.67	41.38	54.81	3.86

1.1.6 Wetlands

The water resources of South Africa have been divided into quaternary catchments, which are regarded as the principal water management units in the country (DWAF 2011). A quaternary catchment is a fourth order catchment in a hierarchical classification system in which the primary catchment is the major unit. The prospecting area is situated with the B71E and B41J quaternary catchments, as represented in Figure 1-1. Quaternary catchment B71E is associated with the Motse River and B41J is associated with the Steelpoort River, the right hand tributary of the Olifants River. The Olifants River catchment has undergone severe water quality degradation as a result of upstream mining; industrial and agricultural activities and further impacts to water quality should be avoided.

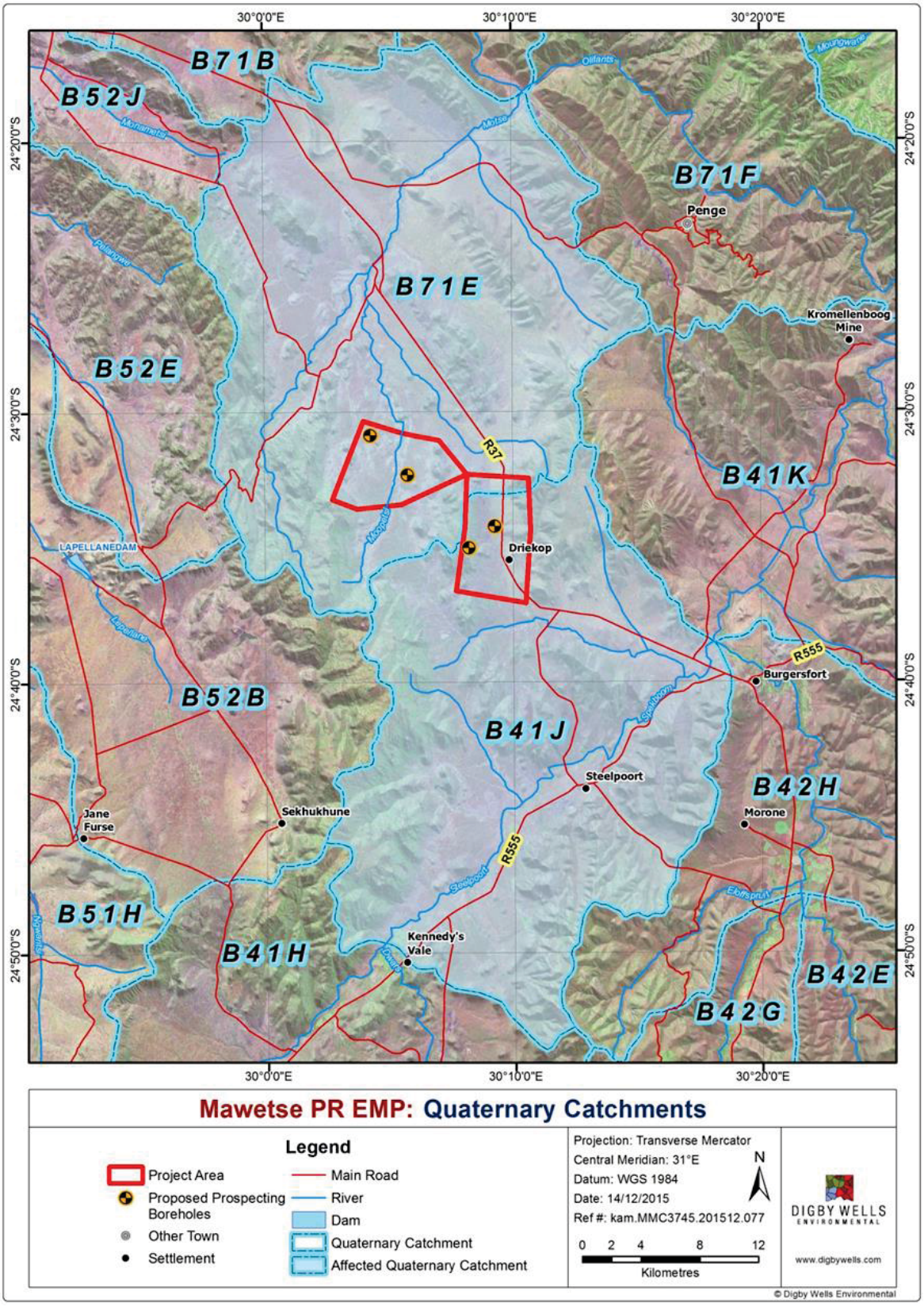


Figure 1-1 Quaternary Catchments

The National Freshwater Ecosystem Priority Areas (NFEPA) strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources were considered to evaluate the importance of the wetland areas located within the project area.

Spatial layers (NFEPA's) used include the wetland classification and ranking. Table 1-10 illustrates the different wetland types recorded according to NFEPA. The NFEPA wetlands have been ranked in terms of importance in the conservation of biodiversity. Table 1-10 below indicates the criteria which were considered for the ranking of wetland areas. The NFEPA wetlands that occur in the vicinity of the project area are depicted below. These include the valley floor, channelled valley bottom wetland (rank 6) and Valley floor, unchannelled valley bottom wetland (rank 6).

Table 1-10: NFEPA wetland classification ranking criteria

Criteria	Rank
Wetlands that intersect with a RAMSAR site.	1
Wetlands within 500 m of an International Union for Conservation of Nature (IUCN) threatened frog point locality; Wetlands within 500 m of a threatened water bird point locality; Wetlands (excluding dams) with the majority of their area within a sub-quaternary catchment that has sightings or breeding areas for threatened Wattled Cranes, Grey Crowned Cranes and Blue Cranes; Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of exceptional Biodiversity importance, with valid reasons documented; and Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands that are good, intact examples from which to choose.	2
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of biodiversity importance, but with no valid reasons documented.	3
Wetlands (excluding dams) in A or B condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion); and Wetlands in C condition AND associated with more than three other wetlands (both riverine and non-riverine wetlands were assessed for this criterion).	4
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing Impacted Working for Wetland sites.	5
Any other wetland (excluding dams).	6

Figure 1-2: NFEPA Wetlands

There were no wetlands encountered during the site visit on the footprint areas of the drill sites, therefore no impacts are expected.

1.1.7 Flora

The study area falls entirely within the centre of the Sekhukhuneland Centre of Plant Endemism. The Sekhukhuneland Centre of Plant Endemism (SCPE) is defined on the basis of geology and corresponds to the surface outcrops of the Rustenburg Layered Suite of the eastern Bushveld Complex. The Sekhukhuneland Centre of Plant Endemism has been described in detail by Van Wyk and Smith (2001), with the exact area being defined as bordered by the Highveld Escarpment to the south, Strydpoort Mountains to the north, the Steenkampsberg and Drakensberg to the east, and the Springbok Flats to the west. From the Steelpoort River valley which lies at about 900 m, the Leolo Mountains rise to 1 932 m, the highest point of the area. In the SCPE there are numerous eroded areas underlain by toxic soils that are considered to be natural features. The SCPE falls within the rainfall shadow of the Drakensberg Escarpment, and it is relatively more arid than the areas to the east. The endemic plants of the SCPE are primarily edaphic specialists that are derived from the unique geology.

The ultramafic substrates, norite, anorthosite and pyroxenite, show a significant positive correlation with percentage endemism. Heavy-metal soils are derived from these formations. Endemics are both herbaceous and woody with endemism high in the Anacardiaceae, Euphorbiaceae, Liliaceae (incorporating Asphodelaceae) and Lamiaceae.

Three main subcentres have been identified for the SCPE, based on the distribution of endemic/near-endemic and threatened plant taxa recorded for each of these areas:

- Roossenekal Subcentre (Roossenekal-Dwars River area): This is the most southern plant diversity 'hotspot' and is characterised by undulating norite hills. This 1 000 km^2 area is a unique ecotone between the Highveld and Lowveld of South Africa. A total of 62 (30/33) SCPE endemics/near-endemics and nine newly assessed Red List taxa occur in this subcentre. Six taxa are exclusively endemic to this subcentre.
- Leolo Mountain Subcentre: The subcentre is merely a geological extension of the former, but is isolated by broad, dry valleys. The Leolo Mountains harbour relict patches of Afromontane Forest and there are rare wetland systems on the summit. There are 29 (19/10) SCPE endemics/near-endemics and eight newly assessed Red Data List taxa in this 400 km^2 subcentre. Five taxa are endemic to this subcentre only.
- Steelpoort Subcentre (Steelpoort-Burgersfort area): It is located in the larger Steelpoort River valley, where it comprises undulating norite, pyroxenite and magnetite outcrops and hills, and dongas (areas of weak structured soils). This 2 600 km^2 is the core region of the SCPE and it is a unique *Kirkia wilmsii*-

dominated mountain bushveld. There are 86 (44/42) SCPE endemics/near-endemics and 16 newly assessed Red Data List taxa in this subcentre. Twenty taxa are endemic to this centre and occur nowhere else. The Mawetse study area is located within this subcentre.

1.1.7.1 Conservation within the SCPE

There are no proclaimed nature reserves within the Mpumalanga portion of the SCPE and there is only one small reserve offering the SCPE some form of legal protection in Limpopo Province; that is the 2 800 ha Potlake Nature Reserve. It is estimated that approximately 29% of the SCPE has already been transformed. The Sekhukhuneland Centre is therefore in need of legal protection.

The SCPE forms part of the Bushveld Igneous Complex, which has ultramafic layers, the largest reserves of chrome and platinum group metals in the world. Surface outcrops of iron-rich chromite and vanadium are being removed at a rapid rate by strip or open pit mining, usually without any detailed knowledge of the flora on these sites). This mineral wealth has resulted in the operation of numerous mines in the Sekhukhuneland area causing the large-scale loss of valuable habitat. These vegetation types are described in more detail below. The species that can be expected within the Prospecting Right area are listed below.

Table 1-11: Expected plant species

Family	Taxon	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo protected plants
PASSIFLORACEAE	*Adenia wilmsii*	-	Protected	-
ALLIACEAE	*Tulbaghia sp. nov.*	-	-	-
ARACEAE	*Stylochaeton sp. nov. A (Siebert 1845)*		-	-
ASPARAGACEAE	*Asparagus intricatus*	-	-	-
LOBELIACEAE	*Cyphia corylifolia*	-	-	-
MESEMBRYANTHEMACEAE	*Delosperma rileyi*	-	-	-
MESEMBRYANTHEMACEAE	*Delosperma zeedebergii*	-	-	-
ACANTHACEAE	*Dyschoriste perrottetii*	-	-	-

Family	Taxon	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo protected plants
ASPARAGACEAE	*Asparagus sekukuniensis*	-	-	-
EUPHORBIACEAE	*Euphorbia barnardii*	-	-	Protected
AIZOACEAE	*Plinthus rehmannii*	-	-	Protected
FABACEAE	*Argyrolobium wilmsii*	-	-	-
EUPHORBIACEAE	*Euphorbia lydenburgensis*	-	-	-
EUPHORBIACEAE	*Euphorbia sekukuniensis*	Lower Risk/Near Threatened	-	-
MALVACEAE	*Hibiscus barnardii*	-	-	Protected
APOCYNACEAE	*Huernia insigniflora*	-	-	Protected
ANACARDIACEAE	*Searsia sekhukhuniensis*	-	-	-
ASTERACEAE	*Callilepis leptophylla*	-	-	-
HYACINTHACEAE	*Eucomis autumnalis clavata*	-	-	-
COMMELINACEAE	*Aneilema longirrhizum*	-	-	-
COMBRETACEAE	*Combretum petrophilum*	Lower Risk/Near Threatened	-	Protected
FABACEAE	*Elephantorrhiza praetermissa*	-	-	Protected
LAMIACEAE	*Plectranthus venteri*	-	-	-
VITACEAE	*Rhoicissus sekhukhuniensis*	-	-	-
ASPHODELACEAE	*Aloe burgersfortensis*	-	-	-
CAPPARACEAE	*Boscia albitrunca macrophylla*	-	-	-

Family	Taxon	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo protected plants
CELASTRACEAE	*Catha transvaalensis*	-	-	-
ASCLEPIADACEAE	*Ceropegia distincta subsp. verruculosa*	-	-	Protected
PASSIFLORACEAE	*Adenia fruticosa simplicifolia*	-	-	Protected
ASPHODELACEAE	*Aloe reitzii reitzii*	-	-	-
HYACINTHACEAE	*Eucomis montana*	-	-	-
SCROPHULARIACEAE	*Jamesbrittenia macrantha*	-	-	-
CELASTRACEAE	*Lydenburgia cassinoides*	-	-	-
SCROPHULARIACEAE	*Nemesia zimbabwensis*	-	-	-
ASPARAGACEAE	*Asparagus fourei*	-	-	-
CRASSULACEAE	*Crassula setulosa var. demunita*	-	-	-
HYACINTHACEAE	*Eucomis vandermerwei*	-	-	-
IRIDACEAE	*Gladiolus sekukuniensis*	-	-	-
CELASTRACEAE	*Gymnosporia sp. nov.*	Vulnerable (*Gymnosporia bachmannii*)	-	-
HYACINTHACEAE	*Ledebouria dolomiticola*	-	-	-
ANACARDIACEAE	*Searsia batophylla*	-	-	Protected
SANTALACEAE	*Thesium davidsonae*	-	-	-
SANTALACEAE	*Thesium gracilentum*	-	-	-
ALLIACEAE	*Tulbaghia coddii*	-	-	-

Family	Taxon	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo protected plants
ARACEAE	*Zantedeschia jucunda*	-	Vulnerable	Protected
ARACEAE	*Zantedeschia pentlandii*		-	Protected

1.1.7.1.1 Sekhukhune Mountain Bushveld

This is a dry, open to closed microphyllous and broad-leaved savanna on hills and mountain slopes that form concentric belts parallel to the north-eastern escarpment. The open bushveld is often associated with ultramafic soils on southern aspects and contain a high diversity of edaphic specialists. The bushveld of mountain slopes is generally taller than in the valleys. The bushveld of valleys and dry northern aspects is usually dense, like thicket. This vegetation unit is approximately equivalent to the major vegetation type described by Siebert *et al*. (2002) as a mixture of *Kirkia wilmsii-Terminalia prunellioides* Closed Mountain Bushveld and *Combretum hereorense-Grewia vernicosa* Open Mountain Bushveld. Siebert *et al*. (2002) indicate that these two communities are floristically very similar and occur in the same geographic region.

This vegetation type is considered to be Least Threatened (refer to Table 1-12). Although none is conserved, approximately 15% is transformed, mainly by cultivation and urbanisation. An increasing area is under threat from mining activities. This vegetation type forms part of the Steelpoort Subcentre of the SCPE. It is the most widespread vegetation type in the study area, but incorporates the greatest diversity of plant communities.

1.1.7.1.2 Sekhukhune Plains Bushveld

This is a short, open to closed thornveld occurring on the mainly semi-arid plains and open valleys between the chains of hills and small mountains running parallel to the escarpment. Encroachment by indigenous microphyllous trees and invasion by alien species is common. This is approximately equivalent to the major vegetation type described by Siebert *et al*. (2002) as *Acacia tortilis-Dichrostachys cinerea* Northern Dry Mixed Bushveld.

This vegetation type is considered to be Vulnerable (refer to Table 1-12) with 2% conserved of a target of 19% and approximately 25% transformed, mainly by dry- land subsistence cultivation. The vegetation is heavily degraded in places and over- exploited for cultivation, mining and urbanisation. There is a small amount of pressure from chrome and platinum mining and associated infrastructure.

Of the two vegetation types occurring in the study area (Table 1-12), Sekhukhune Mountain Bushveld is considered to be Least Threatened and Sekhukhune Plains Bushveld is considered to be Vulnerable.

Table 1-12: Conservation status of different vegetation types occurring in the study area, according to Driver et al. 2005 and Mucina *et al*. 2005

Vegetation Type	Target (%)	Conserved (%)	Transformed (%)	Conservation Status
Sekhukhune Mountain Bushveld	24	0.4	15	Least Threatened
Sekhukhune Plains Bushveld	19	2	25	Vulnerable

1.1.7.1.3 Limpopo Critical Biodiversity Areas

The Limpopo Critical Biodiversity Areas (CBA's) assessment is a bioregional conservation plan, whereby sites were selected based on their biodiversity characteristics, spatial configuration and requirement for meeting targets for both biodiversity pattern and ecological processes. Sites that have been categorised as CBA 1 are regarded as irreplaceable and the conservation of these areas is imperative to meet the biodiversity targets of the Limpopo CBA's. The study area overlies an area that has been classified as CBA 1 and 2, as represented below (Figure 1-3). CBA 2's are considered "optimal" as there is significant design involved in their identification and should be maintained in their natural state. Ecological Support Areas (ESA) are regarded as areas that are not essential for meeting biodiversity targets for ecosystems, species and processes. The drill sites are all located in ESA 1 or 2.

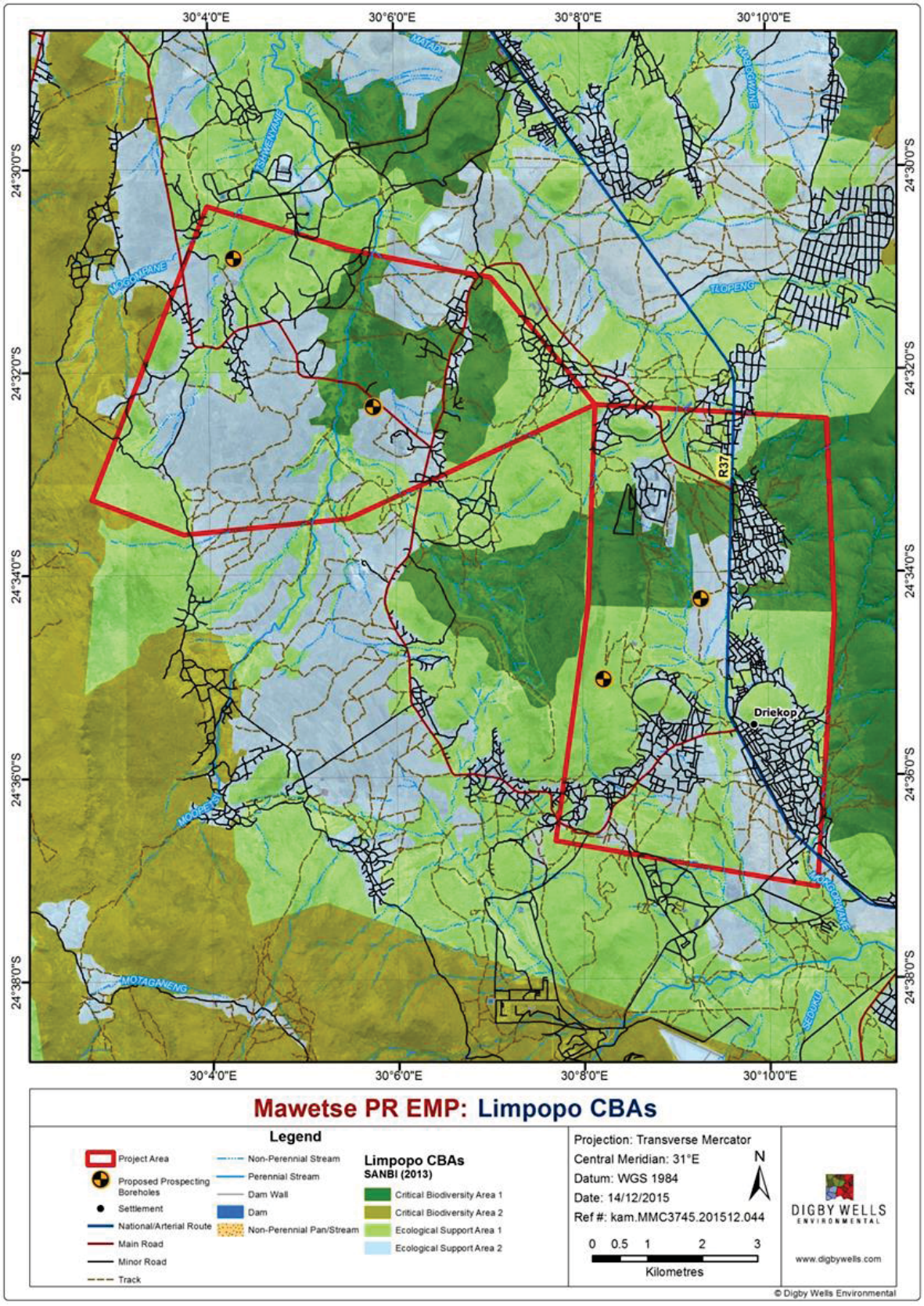


Figure 1-3: Limpopo CBA and the Maweste Prospecting Area

1.1.8 Fauna

1.1.8.1 Animal Species of Special Concern

The objective of this section was to compile a list of animal species for which there is conservation concern. Species discussed are those that have been previously recorded from either Mpumalanga or Limpopo Provinces, since the Sekhukhuneland area occurs on the boundary between these two provinces. Those species with a geographical distribution that includes the study area are discussed further.

1.1.8.1.1 Mammals

There are thirteen Red List mammal species that have a high chance of occurring in the study area, many of which have been previously recorded in grids within the study area. Three of these species, the Spotted-necked otter, Swamp musk shrew and Water rat, occur in aquatic, semi-aquatic or marshy habitats. Two species, the Greater dwarf shrew and Pangolin, are dependent on the presence of ants and/or termites or termite mounds. One species, the Rock dormouse, occurs entirely in rocky terrain and, in the study area, the Lesser grey-brown musk shrew occurs in rocky areas. A single species of bat, Welwitsch's hairy bat, roosts in shrubs and trees. The remaining five species, the African weasel, Brown hyena, Honey badger, Single-striped mouse and Southern African hedgehog, have wide habitat tolerances or more catholic requirements and it is difficult to establish a link with a single vegetation type or habitat and these species. Table 1-13 below provides the status of the mammal species that were previously recorded and their status according to the IUCN Red List, the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) Threatened or Protected Species (TOPS) List, and the Limpopo Environmental Management Act. (Act No 7 of 2003) (Limpopo Environmental Act).

Table 1-13: Mammal species previously recorded

Common Name	Scientific Name	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo Environmental Act
African weasel	*Poecilogale albinucha*	Least Concern	-	-
Brown hyena	*Hyaena brunnea*	Near Threatened	Protected	Protected
Bushveld gerbil	*Tatera leucogaster*	Least Concern (*Gerbilliscus leucogaster*)	-	-
Dark-footed forest shrew	*Myosorex cafer*	Least Concern	-	-

Common Name	Scientific Name	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo Environmental Act
Darling's horseshoe bat	*Rhinolophus darlingi*	Least Concern	-	-
Forest shrew	*Myosorex varius*	Least Concern	-	-
Geoffroy's horseshoe bat	*Rhinolophus clivosus*	Least Concern	-	-
Greater dwarf shrew	*Suncus lixus*	Least Concern	-	-
Greater musk shrew	*Crocidura flavescens*	Least Concern	-	-
Hildebrandt's horseshoe bat	*Rhinolophus hildebrandtii*	Least Concern	-	-
Honey badger	*Mellivora capensis*	Least Concern	Protected	Protected
Least dwarf shrew	*Suncus infinitesimus*	Least Concern	-	-
Lesser dwarf shrew	*Suncus varilla*	Least Concern	-	-
Lesser grey-brown musk shrew	*Crocidura silacea*	Least Concern	-	-
Lesser red musk shrew	*Crocidura hirta*	Least Concern	-	-
Oribi	*Ourebia ourebi*	Least Concern	Endangered	Protected
Pangolin	*Manis temminckii*	Vulnerable	Vulnerable	Specially Protected
Reddish-grey musk shrew	*Crocidura cyanea*	Least Concern	-	-
Robust golden mole	*Amblysomus robustus*	Vulnerable	Endangered	-
Rock dormouse	*Graphiurus platyops*	Least Concern	-	-
Sable antelope	*Hippotragus niger*	Least Concern	-	Protected

Common Name	Scientific Name	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo Environmental Act
Schreiber's long-fingered bat	*Miniopterus schreibersii*	Near Threatened	-	-
Serval	*Leptailurus serval*	Least Concern	Protected	Protected
Sharp's grysbok	*Raphicerus sharpei*	Least Concern	Protected	Specially Protected
Short-eared trident bat	*Cloeotis percivali*	Least Concern	-	-
Short-snouted elephant shrew	*Elephantulus brachyrhynchus*	Least Concern	-	-
Single striped mouse	*Lemniscomys rosalia*	Least Concern	-	-
Southern African hedgehog	*Atelerix frontalis*	Least Concern	Protected	Protected
Spotted-necked otter	*Lutra maculicollis*	Near Threatened	Protected	-
Sundevall's leaf-nosed bat	*Hipposideros caffer*	Least Concern	-	-
Swamp musk shrew	*Crocidura mariquensis*	Least Concern	-	-
Temminck's hairy bat	*Myotis tricolor*	Least Concern	-	-
Tiny musk shrew	*Crocidura fuscomurina*	Least Concern	-	-
Water rat	*Dasymys incomtus*	Least Concern	-	-
Welwitsch's hairy bat	*Myotis welwitschii*	Least Concern	-	-

1.1.8.1.2 Avifauna

The following protected bird species could be present within the Prospecting Right area, according to the Second Southern African Bird Atlas Project (SABAP2) species lists for Quarter Degree Square (QDS) 2430CA.

Table 1-14: Protected Bird species

Common name	Taxon name	IUCN	SA Red List
Stork, Abdim's	*Ciconia abdimii*	LC	NT
Vulture, Cape	*Gyps coprotheres*	VU	VU
Vulture, White-backed	*Gyps africanus*	EN	VU
Eagle, Verreaux's	*Aquila verreauxii*	LC	VU

1.1.8.1.3 Reptiles

There are six Red List reptile species that could occur in the Prospecting Right area; these are listed in Table 1-15 below. All six of these species have a high chance of occurring in the study area and, on the basis of habitat requirements, are most likely to occur in rocky habitats, either on rocky outcrops or in rocky, well-wooded valleys.

Table 1-15: Expected Reptile species

Common Name	Scientific Name	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo Environmental Act
African rock python	*Python sebae natalensis*	-	Protected	Protected
Yellowbellied house snake	*Lamprophis fuscus*	Lower Risk/Near Threatened	-	-
Striped harlequin snake	*Homoroselaps dorsalis*	Lower Risk/Near Threatened	-	-
Swazi rock snake	*Lamprophis swazicus*	Lower Risk/Near Threatened	-	-
Beyer's longtailed seps	*Tetradactylus breyeri*	Vulnerable	-	-
Variegated wolf snake	*Lycophidion variegatum*	-	-	-

1.1.8.1.4 Amphibians

There is one provincially protected amphibian that could occur in the study area, the Giant bullfrog. This species occurs in seasonal, shallow grassy pans in flat open areas, but also utilises non-permanent vleis and shallow water on the margins of waterholes and dams. It has not previously been recorded in the study area and, on the basis of habitat requirements, has a medium chance of occurring in the study area.

Table 1-16: Expected Amphibian species

Common Name	Scientific Name	Status		
		IUCN (2015-4)	NEMBA TOPS List (2007)	Limpopo Environmental Act
Northern forest rain frog	*Breviceps sylvestris*	Endangered	-	-
Giant bullfrog	*Pyxicephalus adspersus*	Least Concern	Protected	Protected

1.1.9 Cultural Heritage

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Project. No significant heritage resources were identified within 100 m of the proposed prospecting borehole locations during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, Early Farming Community (EFC) sites, burial grounds and historical structures, though none were identified within 100 m of the prospecting borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey. While no impacts are envisioned for the two heritage resources identified within the proposed prospecting area, the Cultural Significance of the heritage resources has been completed to assist with the implementation of the recommendations i.e. Chance Finds Procedures.

1.2 The Specific Environmental Features on the Site Applied for which May Require Protection, Remediation, Management or Avoidance

The proposed prospecting area lies within the SCPE which corresponds with the surface outcrops of the Rustenburg layered suite of the Eastern Bushveld Complex. This complex contains the largest reserves of chrome and platinum group metals in the world. This has resulted in many mining operations in the region which has resulted in the loss of natural habitat in the region.

The area in general compromises of undulating topography with rolling hills throughout the prospecting area. Some higher peaks, however, can be found in the southern part of the prospecting area. During the site visit, occasional farm houses were found scattered along

the farm boundaries within the proposed prospecting area. These farm houses are occupied with farm workers and minimal infrastructure is located within the area. In addition, no prospecting will take place within 100 m of any existing houses.

1.2.1 Map Showing the Spatial Locality of all Environmental, Cultural/Heritage and Current Land Use Features Identified on Site

Plan 4, Appendix A, depicts the Land Uses identified on the application area.

Refer to Plan 5, Appendix A, for a map and aerial extent indicating the relative position of the heritage sites in comparison to the provisional locations of the Prospecting sites.

1.3 Confirmation that the Description of the Environment has Been Compiled with the Participation of the Community, the Landowner and Interested and Affected Parties

Announcement of the proposed Prospecting activities to all Interested and Affected Parties (I&APs) was undertaken on 07 December 2015 and Digby Wells requested comments and responses regarding the proposed Project. Details of the Engagement Process were set out in a Consultation Report that has been submitted to the DMR. The EMP Report will be made available on the Digby Wells website (www.digbywells.com). Although the stipulated submission date for the EMP Report is 09 January 2015, all comments received after this date will be timeously forwarded to the DMR by Digby Wells.

2 Regulation 52 (2) (b): Assessment of the Potential Impacts of the Proposed Prospecting or Mining Operation on the Environment, Socio- Economic Conditions and Cultural Heritage

2.1 Description of the Proposed Prospecting or Mining Operation

The area to be targeted for prospecting forms part of the Bushveld complex which is the world's largest layered intrusion and contains an ultra-basic to basic unit up to 9 km thick, known as the Rustenburg layered Suite which outcrops as eastern, western and northern lobes. The basic to ultrabasic succession is traditionally divided into the Lower, Critical, Main and Upper zone.

The economically viable chromite reserves are mostly hosted within the critical zone and the complex also contains 56% of all known platinum group elements. The Lower Group (LG) 2, Middle Group (MG) 2 and Upper Group (UG) 2 are the mineable seams which are economic. The LG consists of seven chromite layered hosted in the feldspathic pyroxenite. The MG which is above the LG compromises four major chromite layers. The UG chromite layers are contained in norite and anorthosite sequences.

The area is very prospective for the following commodities, namely:

- Copper;
- Chrome;
- Platinum;
- Gemstone;
- Nickel; and
- Attapulgite.

It is the intention that prospecting activities will be undertaken over a period of between two to five years. In the first two years (Stage 1), non-invasive investigations that include: the collection of existing data; geological and structural mapping and interpreting; and rock and soil sampling will be undertaken. The results of these initial investigations undertaken in the first two years of prospecting will determine whether further exploration will continue or cease. If further exploration is deemed feasible, it is envisaged that four boreholes will be drilled. Prospecting activities will take place on the farms as mentioned in Table 1-1 above. The following minerals will be prospected for:

- Chrome;
- Copper;
- Gemstone;
- Vanadium;
- Andalusite; and
- Magnetite.

It is not envisaged that more than four boreholes will be drilled and none will be within 100 m of a river or wetland. The precise location of the boreholes will be determined during Phase 1. After completion of the prospecting activities, it is likely that an Application for a Mining Right will be submitted to the DMR and simultaneously an application for Environmental Authorisation will be made for the associated project activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations (December 2014).

2.1.1 The Main Prospecting Activities (e.g. Access Roads, Topsoil Storage Sites and Any Other Basic Prospecting Design Features)

Prospecting activities will include both invasive and non-invasive methods. Invasive methods are activities which result in land disturbances and comprise of drilling, and sampling. Non-invasive methods do not cause any land disturbance and include desktop research and detailed geophysical surveys.

The prospecting activities will be carried out in different stages, that is:

- Stage 1: Desktop review, soil and rock sampling and geological interpretation; and
- Stage 2: Laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

A description of the prospecting methods is provided in the sections below.

2.1.1.1 Desktop Study

The desktop study aims to assess the historical data of the prospecting property. It compromises of the following key activities:

- Historical data;
- Previous prospecting activities;
- Mining activity; and
- Challenges related to exploration and mining.

2.1.1.2 Geological Field Mapping

After conducting a desktop study of the property, field mapping of the area will be conducted to determine various rocks and minerals that have an economic value. This might include the following mapping techniques:

- Identifying various rock and mineral lithologies;
- Mapping geological structures that might be of economic importance; and
- Mapping alteration processes that might be of economic importance such as weathering, leaching, dissolution and enrichment processes.

2.1.1.3 Geochemical Sampling

After detail mapping of the property, geochemical samples of various size fractions will be collected to determine the chemical composition of the identified mineral and rocks. This particular sampling programme will entail:

- Soil sampling;
- Rock sampling; and
- Stream (hydrogeochemical) sampling.

2.1.1.4 Geophysical Survey

After the detection of the geological and geochemical anomalies, geophysical techniques will be used to pinpoint areas that have potential for follow-up programmes.

2.1.1.4.1 Magnetics

In areas where there is poor exposure to rock formation or where geological mapping was unable to identify certain rock formation, ground magnetics will act as a useful exploration technique. The rationale of this technique is to identify magnetic and non-magnetic minerals.

2.1.1.4.2 Electromagnetics

Depending on the effectiveness of ground magnetics, electromagnetics might be used as a follow-up programme to differentiate between conductive and non-conductive areas. The interval to be used will be a 50 m interval spacing so as to have a higher resolution.

2.1.1.5 Drilling

To have a better understanding of the geology and structure of the anomalies, percussion or diamond drilling will be used. The initial phase will entail widely spaced short holes of about 100 m deep. If initial results are encouraging, subsequent drilling would entail further closed spaced drilling with deeper holes.

The range of data shown will be coring run in metres. The following information will be recovered:

- Graphic lithological section;
- List of assays;
- Degree of weathering;
- Colour;
- Grain size;
- Field rock name;
- Foliation;
- Structure;
- Rock minerals; and
- Angle between planar structure and long axis.

Invasive methods, such as drilling, will have an impact, although limited, on the receiving environment.

Activities associated with drilling include the establishment of temporary access roads, where existing access roads cannot be used. These access roads will be in the form of tracks and will be utilised for the duration of the drilling. Once drilling at the particular site has concluded, these tracks will be rehabilitated, along with the drilling site. A number of small drilling sample sites will be cleared of vegetation to allow for the drilling operation to commence.

Water will be sourced off site in the event where no water is available on site. Water will be circulated throughout the drilling operation and is needed to cool the drill rig. Circulated water will be stored in temporary plastic lined oil-sludge-water separation sump. One sump hole will be dug on-site for oil-sludge-water separation and the sump will be lined with a plastic liner. A generator will be used on site as the energy source for all equipment and prospecting activities.

All waste that is generated on site will be disposed of offsite at an appropriate facility. The site will have a designated area to store hydrocarbons and chemicals. These must not be stored on bare soils and should be stored in a bunded area. Vehicles will not be serviced on site and in the event that there are leaks from vehicles, drip trays will be utilised. In the event that soils do become contaminated, the area of contaminations will be cleaned up and the soil disposed of at an appropriate facility.

Topsoil will be removed and stockpiled separately from the subsoils during the construction of the sump and stockpiled adjacent to the drilling operation and will not exceed a height of 1 m. The stockpiled soil will be used during the rehabilitation of the prospecting drill site to backfill the sump and level the area.

The clearing of vegetation to allow drilling to commence will generally not exceed an area of 10 m by 10 m. Figure 2-1 below illustrates a typical drill site with the mobile drill rig, lined sump, topsoil stockpile area and sampled core to be sent for analysis. The drill site and tracks will be rehabilitated immediately after drilling has concluded.

Figure 2-1: Example of a prospecting drill site

2.1.2 Plan of the Main Activities with Dimensions

No permanent infrastructure will be constructed as the proposed activities are only applicable to prospecting and are therefore temporary. The individual prospecting drill sites measure approximately 10 m by 10 m in area. Only mobile equipment will be used during the invasive prospecting methods and the equipment will be removed from the site once activities have been concluded. Following the prospecting activities, the prospecting drill site will be ripped, levelled and vegetated to ensure that the area returns to its natural condition. The sump will be backfilled; however, if hydrocarbons are found to have contaminated the sump, the sump will be treated before it is backfilled. Chemical toilets will be placed on site for the use of the drilling contractor and crew. Waste disposal bins are located at each site for waste sorting and disposal.

Refer to Plan 3, Appendix A, for a map and aerial extent indicating the location of the proposed Prospecting sites on the farms Driekop 253 KT and Mooihoek 255 KT.

The location of the proposed prospecting boreholes is summarised in Table 2-1 below.

Table 2-1: Proposed prospecting borehole locations

Borehole	Latitude	Longitude
001	-24.571005	30.154687
002	-24.584149	30.137168
003	-24.514698	30.071267
004	-24.539213	30.096119

Below is a summary of the five-year Prospecting work schedule. It is important to note that the work schedule is result-driven and the outcome of the first stage will determine whether the second stage will be carried out. The stages, as described in Section 2.1, are further divided into 5 phases over a 5 year period. These phases are detailed below:

2.1.2.1 Year 1 (Phase 1)

- Collection of existing data
- Literature review and desktop studies
- Geological and structural mapping
- Geological and structural interpretation
- Rock and soil sampling

2.1.2.2 Year 2 (Phase 2)

- Laboratory analysis
- Interpretation of geochemical anomalies

- Geophysical survey

These two phases make up the first stage. After this stage results will be evaluated to determine whether further exploration should be ceased or continued.

2.1.2.3 Year 3 (Phase 3)

- Percussion drilling
- Analysis
- Interpretation drill-cores
- Geological modelling

After this Phase it will be determined whether to continue or abandon exploration based on results from initial drilling.

2.1.2.4 Year 4 (Phase 4)

- Pre-feasibility studies
- Geological modelling
- Resource calculation
- Surveying

If pre-feasibility studies indicate that is not a viable project then further exploration will cease

2.1.2.5 Year 5 (Phase 5)

- Bankable feasibility studies
- Environmental studies
- Social impact studies
- Application for a mining and environmental authorisation

After this phase it will be established whether the project is viable. If it is deemed bankable, Mawetse will proceed to apply for mining and environmental authorisations.

2.1.3 Description of Construction, Operational, and Decommissioning Phases

2.1.3.1 Construction Phase

No physical construction will take place as no permanent infrastructure will be established. Activities will relate to the possible establishment of temporary access roads to each drill site, as well as the clearing of vegetation for the establishment of the prospecting drill site.

Grass and topsoil of the whole prospecting site will be removed together and then spread again during the rehabilitation.

Potential access roads will be constructed from existing road infrastructure with the shortest possible route to the prospecting drill site used, resulting in minimal environmental impacts related to this activity. The temporary access roads will only be utilised for transporting the drill rig onto site as well as by personnel vehicles for site inspections and the pick-up of drill core during the Operational Phase.

One sump will be constructed within the boundary of the prospecting site footprint to separate oil, sludge and water. Topsoil and subsoil will be stockpiled separately and stored for future rehabilitation of the site once drilling has concluded. Topsoil stockpiles are covered during windy and rainy months to prevent soil erosion.

2.1.3.2 Operation Phase

The drill rig will be brought onto the identified prospecting site to commence drilling. The drill rig will target the prospecting area for drill core which will be sent to a laboratory for analysis. Water stored on the prospecting drill site will be circulated and re-used to cool the drill rig, until drilling on site is complete. The timeframes required to complete the drilling range from a couple of weeks to a maximum of one year, depending on the geotechnical rock conditions and any possible technical problems.

The drill crew will stay close to the drill site in temporary accommodation facilities, such as mobile homes which will be located on the Driekop farm. Water will be sourced off site and stored near the mobile homes. The energy source utilised is gas as open fire is not permitted, especially during the winter months. Waste will be separated on site in accordance with the principles of waste recycling and re-use, as stipulated by the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA).

2.1.3.3 Decommissioning and Rehabilitation Phase

Once drilling has concluded at a particular prospecting drill site, rehabilitation will commence immediately. All mobile equipment will be removed from the site to allow for rehabilitation. Figure 2-2Figure 2-2 below displays an example of a prospecting drill site immediately following rehabilitation.

Rehabilitation activities will include the following:

- Rehabilitation of each drill site concurrently with the drilling programme. As the drill rig is removed from the site, rehabilitation will commence;
- Ensure that all hydrocarbons are removed from the site and separated from the water;
- All hydrocarbons are to be removed from the drill site and disposed of at a registered municipal waste handling facility;

- Ensure the sump is treated with biodegradable product in case any leaking occurred during use;
- All other domestic waste drums are to be removed from the site and waste disposed of at a registered municipal waste management facility. No waste is to be burned or buried at any time during the Prospecting activities;
- Plastic liners used in the sump will be removed prior to final rehabilitation. The plastic liners will either be re-used, where possible, or disposed of at a registered municipal waste handling facility;
- Stockpiled subsoil will be backfilled into the sump and used to level the drill site;
- Where necessary, the area will be ripped in cases where the soil has become compressed and compacted; and
- Topsoil generally contains seeds needed for future rehabilitation. However, vegetation establishment will be monitored and, if necessary, additional seeds will be planted for the establishment of indigenous vegetation.

Figure 2-2: Example of a prospecting site following rehabilitation

2.1.4 Listed Activities (in Terms of the NEMA EIA Regulations)

Due to the small scale of the Prospecting activities no , and the temporary nature of these activities, no listed activities according to the Environmental Impact Assessment Regulations, 2010, published in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) will be triggered[2]. It will be ensured that no Prospecting activities will be undertaken within 32 m of a watercourse which would be the only probable listed activity that could be triggered. No electricity or bulk water supply will be required.

2.2 Identification of Potential Impacts

2.2.1 Potential Impacts per Activity and Listed Activities

2.2.1.1 Activity: Site Clearing and Site Establishment

This activity relates to the site clearing for the establishment of the drill sites. The drill sites will not be larger than about 10 m by 10 m each. Temporary access roads may be established in order to gain access to the drill sites. Should they be required, the temporary access roads will be established based on the shortest route from existing road infrastructure to the drill sites.

The activity will entail the clearing of vegetation, such as small shrubs (i.e. herbaceous layer) and grasses. Indigenous trees will not be removed. Vegetation will be removed by means of manual labour or mobile earth moving equipment. Such equipment will be removed from the site once the site clearing is complete. Topsoil will be removed and stockpiled for use during future rehabilitation.

Site establishment will include setting up of a potential contractor's camp, and bringing equipment, such as the drill rig, onto site. Service and mechanical equipment will also be brought onto site. No permanent infrastructure will be established and all equipment will be removed from the site once drilling has been concluded.

The impacts associated with this activity are discussed below.

2.2.1.1.1 Soil Impacts

During site clearing and site establishment, the site and access roads will be cleared of vegetation. The removal of the vegetation cover will result in the soil surface being exposed. Compaction from the machinery used, and soil erosion as a result of the soils being exposed to wind and water are likely to cause degradation in the soil structure and quality with the potential for soil contamination.

[2] Although the EIA Regulations 2014 have not been applied to this EMP, the Prospecting activities will not trigger any activates in the 2014 Listing Notices.

Soil erosion may take place further when surface water runoff comes into contact with the exposed soils on the cleared site.

This impact is exacerbated on sloped terrain and the more sensitive shallow soils that dominate the steeper terrain, as well as along compacted road surfaces. Heavy rainstorms will exacerbate and increase erosion on bare patches of land and this impact is expected to be enhanced and possibly more severe along unpaved and compacted roads.

The impacts of stripping vegetation, water runoff and erosion of soils will be negative and generally restricted to on-site, albeit that on-going erosion of soil will result in the sedimentation of waterways, streams and dams. Thus, the main impacts during site clearing could lead to the following:

- Soil compaction and soil loss leading to the reduction in eco system services and agricultural potential; and
- Soil erosion which leads to sedimentation of surface water resources.

The clearing of vegetation and removal of topsoil at the Prospecting sites will result in the loss of vegetation communities and biodiversity in general. The disturbance of the vegetation and land may result in the potential loss of species in the immediate area.

2.2.1.1.2 Fauna and Flora Impacts

The clearing of vegetation and removal of topsoil at the sites will result in the loss of vegetation communities and biodiversity in general. The disturbance of the vegetation and land may result in the potential loss of species in the immediate area.

The clearing of vegetation may impact on the Threatened Ecosystems of the Eastern Highveld Grassland and Soweto Highveld Grassland ecosystems.

Due to the temporary nature of prospecting activities, no meaningful impact on fauna is expected.

2.2.1.1.3 Surface Water Quality Impacts

Earth clearing for the establishment of the temporary drill site, contractor camp, possible access roads and the on-site sump may result in increased turbidity and silt in the surface water resources, as a result of increased dust and soil erosion.

Site clearing and the mobilising of equipment on the prospecting sites has a high potential for the spillage of hydrocarbons which will negatively affect the water quality.

2.2.1.1.4 Surface Water Quantity Impacts

The isolation of the clean and dirty areas during the establishment of the site, as well as equipment and the contractor's camp on-site, will result in the prevention of surface water runoff from reporting to the catchments. This will negatively affect water quantity.

2.2.1.1.5 Dust and Noise Creation

The removal of vegetation during the clearing of the site and possible access roads will cause an increase in dust and noise levels. Dust levels will increase due to soils being exposed and from being stirred up due to vehicular activities.

2.2.1.2 Activity: Drilling

Drilling of the area will be undertaken by diamond core drilling with a drill bit diameter of 36,4 mm (BQ size). The drill bit is attached to the drill string, which is suspended from the drill rig's derrick, and then rotated in the hole. During the first part of the drilling operation, the drill bit will crush the rock into small particles called cuttings and these cuttings will be removed from the bottom of the hole by the drilling fluid. Once the top section of the hole has been drilled, a steel casing will be inserted to secure the walls of the hole and to prevent groundwater contamination.

The impacts associated with drilling are discussed below.

2.2.1.2.1 Soil Impacts

Should rehabilitation not take place immediately, and the area is not backfilled and levelled prior to a large rain event, soils could wash off into drainage and water systems, resulting in the permanent loss of valuable topsoil, as well as the sedimentation of rivers and streams.

Soils would most likely have been compacted on-site during the drilling activities. Should the site not be ripped during rehabilitation, the capability of the land will be negatively affected. Compaction of soil, due to the machinery on-site, as well as personnel and vehicular activity, could be evident. The likelihood of such an impact is likely and will require rehabilitation measures once prospecting has concluded.

Although the provisional locations of the Prospecting sites do not occur on the Land Type Ea20 (Section Rainfall), any areas where Swartland and Valsrivier soils occur should be avoided as the subsoil for such Land Types are highly susceptible to erosion, with the formation of gullies a distinct possibility.

2.2.1.2.2 Fauna and Flora Impacts

If soil erosion has taken place during the operational phase, it will be difficult for vegetation to re-establish itself. The establishment of alien invasive species could be prominent on the Prospecting sites following the removal of all personnel and machinery.

Should rehabilitation be effective and thorough, floral species should re-establish themselves within the Prospecting area and possible access roads.

Faunal species will return to the area following the rehabilitation of the area and establishment of natural vegetation and therefore habitat.

2.2.1.2.3 Surface Water Quantity Impacts

Surface water quantity will increase due to the backfilling of the sump and disposal of the sump material, allowing runoff to return to the catchment. This is however not expected to be significant considering the size of the drill site. This impact will be a positive impact with a net neutral benefit as the drainage pattern will be returned to its predetermined state. Backfilling and the profiling of the site must ensure that the site resembles the pre-prospecting state.

2.2.1.2.4 Surface Water Quality Impacts

During the removal of all equipment and waste from the site, there will be increased vehicular movement and this could result in increased dust and soil erosion which could lead to the sedimentation of the streams and rivers on site.

The most significant impact will be the mobilisation of contaminants, such as hydrocarbons, from the surface environment due to spillages that have not been effectively cleaned-up, and these could find their way into the surface water resources.

The decommissioning of the sump could result in the mobilisation of material that leaked during drilling activities and accidental spillages. Such impacts will negatively affect the quality of the surface water.

2.2.1.2.5 Dust and Noise Impacts

Drilling could increase the ambient noise levels in the area. This impact is considered to be low as the recommended noise levels of 45 dB (decibels) during daylight hours in rural areas should not be exceeded. No drilling will take place during night-time hours i.e. from 6pm to 6am. The SANS 10103: 2008 standards of "*the measurement and rating of environmental noise with respect to annoyance and speech communication*" have set guidelines of 45 dB in rural areas during daylight hours, as measured from the nearest farmstead.

Dust could be generated from vehicles using the existing roads to travel to drilling sites on a daily basis. In addition, dust could become a nuisance during windy days as additional surface areas will be exposed due to the cleared vegetation. It is anticipated, however, that the impact will be of a short duration and therefore, low significance.

2.2.1.3 Activity: Site Rehabilitation

Site rehabilitation involves the removal of all equipment and personnel from the site and the restoration of the site to as close to its previous state as possible. Plastic linings in the sump will be removed and could be re-used at the next Prospecting drill site, if possible. If the sump linings are no longer usable, they will be disposed of at a registered hazardous municipal waste handling facility.

Once all equipment has been removed, the sump can be backfilled and the area levelled with the stockpiled topsoil from the site clearing activities.

The impacts associated with site rehabilitation are discussed below.

2.2.1.3.1 Soil Impacts

Should rehabilitation not take place immediately, and the sump is not backfilled and levelled prior to a large rain event, soils could wash off into drainage and water systems, resulting in the permanent loss of valuable topsoil, as well as the sedimentation of rivers and streams.

Soils would most likely have been compacted on-site during the drilling activities. Should the site not be ripped during rehabilitation, the capability of the land will be negatively affected.

2.2.1.3.2 Flora and Fauna Impacts

If soil erosion has taken place during the operational phase, it will be difficult for vegetation to re-establish itself. The establishment of alien invasive species could be prominent on the Prospecting sites following the removal of all personnel and machinery.

Should rehabilitation be effective and thorough, floral species should re-establish themselves within the Prospecting area and possible access roads.

Faunal species will return to the area following the rehabilitation of the area and establishment of natural vegetation.

2.2.1.3.3 Surface Water Quality Impacts

During the removal of all equipment and waste from the site, there will be increased vehicular movement and this could result in increased dust and soil erosion which could lead to the sedimentation of the streams and rivers on-site.

The most significant impact will be the mobilisation of contaminants, such as hydrocarbons, from the surface environment due to spillages that have not been effectively cleaned-up, and these could find their way into the surface water resources.

The decommissioning of the sump could result in the mobilisation of material that leaked during drilling activities and accidental spillages. Such impacts will negatively affect the quality of the surface water.

2.2.1.3.4 Surface Water Quantity Impacts

Surface water quantity will increase during the rehabilitation processes and disposal of the sump material, allowing runoff to return to the catchment. This impact will be a positive impact with a net neutral benefit as the drainage pattern will be returned to its predetermined state. Backfilling and the profiling of the site must ensure that the site resembles the pre-prospecting state.

2.2.2 Potential Cumulative Impacts

Should an impact described above take place, the following potential cumulative impacts could occur:

- Contribution to the contamination of surface water and groundwater sources in the event that spills are not contained and cleaned up immediately;
- Sedimentation of watercourses in the area (in addition to existing mining operations) in the event of poor topsoil management which will increase Total Dissolved Solids (TDS) and Electric Conductivity (EC);
- Surface water quality impacts, which are associated with accidental spillage of hydrocarbons containing hazardous material, may take an extended period of time to mitigate;
- Soil erosion which could contribute towards the loss of soils. Part of the prospecting is classified as arable land, thus soil erosion could result in the loss of soils with agricultural potential;
- The spread of alien invasive floral species which leads to reduced water quantities in local rivers and streams, as well as contributing towards the national problem of alien invasive species in South Africa's water systems; and
- Increased noise and dust levels may be caused due to the site clearing and drilling activities.

2.2.3 Potential Impact on Heritage Resources

No heritage resources were identified within 100 m of the prospecting boreholes. As such, no impact assessment has been conducted as part of this Heritage Basic Assessment Report (HBAR). Potential risks and unplanned events have been identified and these results along with the results of the Heritage Statement Report (HSR) are attached in Appendix C.

2.2.4 Potential Impacts on Communities, Individuals or Competing Land Uses in Close Proximity

2.2.4.1 Site Establishment

Four boreholes will be sited within the prospecting area and drilling will be undertaken by a suitable qualified contractor it is not expected that there will be any opportunities for local employment

2.2.4.2 Operational Phase (Borehole Drilling)

As for the site establishment it is unlikely that any permanent economic benefits to the local community will arise.

2.2.4.3 Decommissioning Phase

The borehole drilling programme will be short term in nature and decommissioning will take place in accordance to the requirements of the DMR

2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties

The list of potential impacts has been compiled with the participation of the landowner and interested and affected parties. For more information refer to Section 7 of this Report.

2.2.6 Confirmation of specialist report appended

A HBAR entailed*: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province: Heritage Basic Assessment Report* has been compiled and attached to this EMP Report as Appendix C. The remainder of the specialist inputs have been directly written into this report for ease of reference.

3 Regulation 52 (2) (c): Summary of the Assessment of the Significance of the Potential Impacts and the Proposed Mitigation Measures to Minimise Adverse Impacts

3.1 Assessment of the significance of the potential impacts

The significance rating process for impacts follows the established impact assessment formula:

Significance = Consequence x Probability

Where: Consequence = Severity + Spatial Scale + Duration

And: Probability = Likelihood of an impact occurring

The matrix calculates the rating out of 147, whereby Severity, Spatial Scale, Duration and Probability are each rated out of seven as indicated in Table 3-1. The weight assigned to the various parameters for positive and negative impacts is provided for in the formula.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this EMP Report. The significance of an impact is then determined and categorised into one of four categories, as indicated in Table 3-3, which is extracted from Table 3-2. The description of the significance ratings is discussed in Table 3-4.

Tables 3-1, 3- 2, 3- 3 and 3- 4 are displayed in Section 3.1.1 below.

3.2 Criteria of assigning significance to potential impacts

The criterion used to assign significance to potential impacts is displayed in Table 3-1, below.

Table 3-1: Impact Assessment Parameter Ratings

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	*Social, cultural heritage*			
7	Very significant impact on the environment. Irreparable damage to highly valued species, habitat or ecosystem. Persistent severe damage.	Irreparable damage to highly valued items of great cultural significance or complete breakdown of social order.	International The effect will occur across international borders	Permanent: No Mitigation No mitigation measures/ natural process will reduce the impact after implementation.	Certain/ Definite. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	Significant impact on highly valued species, habitat or ecosystem.	Irreparable damage to highly valued items of cultural significance or breakdown of social order.	National Will affect the entire country	Permanent: Mitigation Mitigation measures of natural process will reduce the impact.	Almost certain/Highly probable It is most likely that the impact will occur.
5	Very serious, long-term environmental impairment of ecosystem function that may take several years to rehabilitate	Very serious widespread social impacts. Irreparable damage to highly valued items	Province/ Region Will affect the entire province or region	Project Life The impact will cease after the operational life span of the project.	Likely The impact may occur.
4	Serious medium term environmental effects. Environmental damage can be reversed in less than a year	On-going serious social issues. Significant damage to structures / items of cultural significance	Municipal Area Will affect the whole municipal area	Long term 6-15 years	Probable Has occurred here or elsewhere and could therefore occur.

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	***Social, cultural heritage***			
3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month.	On-going social issues. Damage to items of cultural significance.	Local Local extending only as far as the development site area	Medium term 1-5 years	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur.
2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants.	Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Limited Limited to the site and its immediate surroundings	Short term Less than 1 year	Rare/ improbable Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the project but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Limited damage to minimal area of low significance that will have no impact on the environment.	Low-level repairable damage to commonplace structures.	Very limited Limited to specific isolated parts of the site.	Immediate Less than 1 month	Highly unlikely/None Expected never to happen.

Table 3-2: Probability Consequence Matrix

Significance									
		Consequence (severity + scale + duration)							
		1	3	5	7	9	11	15	18	21
Probability / Likelihood	1	1	3	5	7	9	11	15	18	21
	2	2	6	10	14	18	22	30	36	42
	3	3	9	15	21	27	33	45	54	63
	4	4	12	20	28	36	44	60	72	84
	5	5	15	25	35	45	55	75	90	105
	6	6	18	30	42	54	66	90	108	126
	7	7	21	35	49	63	77	105	126	147

Table 3-3: Significance Threshold Limits

Significance		
High	108 - 147	
Medium-High	73 - 107	
Medium-Low	36 - 72	
Low	0 - 35	

Table 3-4: Significance Scale

Score	Description	Rating
<35	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in either positive or negative medium to short term effects on the social and/ or natural environment.	Low / Negligible
36-72	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either a positive or negative medium to long term effect on the social and/ or natural environment.	Medium-Low / Minor

Score	Description	Rating
73-108	A serious impact, if not mitigated, may prevent the implementation of the project (if it is a negative impact). These impacts would be considered by society a constituting a major and usually a long term change to the (natural and/ or social) environment and result in severe effects or beneficial effects.	Medium-High / Moderate
>108	A very serious impact which, if negative, may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects, or very beneficial effects	High / Major

3.3 Potential Impact of each Main Activity in each Phase, and Corresponding Significance Assessment

Prospecting activities can only commence on the grant of the Prospecting Right by the DMR. The impact assessment, as conducted below, takes the best environmental practices into consideration, as well as the prevailing environmental conditions, as recorded on site.

Each potential impact per activity, as discussed in Section 2.2.1, is assessed in depth below. Mitigation measures and the significance of the potential impacts post mitigation are also included. From the Tables below, it can be seen that the prospecting operation is likely to have minimal impact.

3.3.1 Activity: Site Clearing and Site Establishment

The description of the potential impacts per activity is discussed in detail in Section 2.2.1. Below, the description of the impacts per activity is summarised, along with the assessment of the significance of the impact before and after mitigation.

Table 3- 5 to Table 3-8 display the potential impacts, the significance of the impacts, mitigation measures for such impacts and the significance of the impacts once mitigation has been implemented for the activity of Site Clearing and Site Establishment.

Table 3-5: Soil Impacts during Site Clearing and Site Establishment

Criteria	Details / Discussion
Description of impact	▪ Soil compaction due to machinery and increased personnel activity; ▪ Soil erosion due to site clearance and stockpile exposure to wind and water; and ▪ Loss of topsoil due to erosion.

Criteria	Details / Discussion				
Mitigation required	▪ Avoid establishing sites where Swartland and Valsrivier soils occur to prevent subsoil erosion; ▪ Only clear vegetation within the prospecting borehole footprint (10mx10m) when and where necessary; ▪ Only remove topsoil within the prospecting borehole footprint (10mx10m) when and where necessary; ▪ Ensure topsoil is stored in one dedicated stockpile, less than 1 m high, and away from surface water and drainage lines; and ▪ Topsoil stockpiles will be covered with a plastic liner so as to prevent erosion and contamination.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	2	2	3	6	Medium-Low (42)
Post-Mitigation	1	2	2	5	Low (25)

Table 3-6: Fauna and Flora Impacts during Site Clearing and Site Establishment

Criteria	Details / Discussion				
Description of impact	▪ Loss of vegetation communities; ▪ Loss of biodiversity and habitat fragmentation; and ▪ Direct impact on Threatened Ecosystems of the Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld.				
Mitigation required	▪ Only remove vegetation within the prospecting borehole footprint (10mx10m) when and where necessary; ▪ Minimise the size of the Prospecting sites as far as possible; and ▪ Use existing access roads.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	1	3	3	5	Low (35)
Post-Mitigation	1	2	2	4	Low (20)

Table 3-7: Surface Water Quality Impacts during Site Clearing and Site Establishment

Criteria	Details / Discussion				
Description of impact	▪ Increased turbidity and sedimentation as a result of dust and soil erosion; and ▪ Contamination due to hydrocarbon spillages.				
Mitigation required	▪ Only clear vegetation when and where necessary; ▪ Topsoil stockpiles will be covered with a plastic liner to prevent erosion; and ▪ Contain and clean up hydrocarbon spillages immediately.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	3	2	2	4	Low (28)
Post-Mitigation	2	1	2	3	Low (15)

Table 3-8: Surface Water Quantity Impacts during Site Clearing and Site Establishment

Criteria	Details / Discussion				
Description of impact	▪ Decreased surface water quantity due to the construction and use of sump on site and reduction in catchment area.				
Mitigation required	▪ No mitigation possible.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	1	2	1	6	Low (24)
Post-Mitigation	1	2	1	6	Low (24)

3.3.2 Activity: Drilling

Table 3-9 to Table 3-11 display the potential impacts, the significance of the impacts, mitigation measures for such impacts and the significance of the impacts once mitigation has been implemented during the activity of Drilling.

Table 3-9: Soil Impacts during Drilling

Criteria	Details / Discussion
Description of impact	▪ Spills and leaks of hydrocarbons from the drill rig and vehicles will contaminate the soil; ▪ Compaction of soil due to machinery and personnel on site; and ▪ Stockpiles of topsoil could erode during windy and rain days.

Criteria	Details / Discussion				
Mitigation required	▪ Immediately cease drilling and contain and clean-up any hydrocarbon spillages as they occur. Soil will be remediated using the correct methods; ▪ Ensure the spill clean-up kits are readily available in the event of a spillage; ▪ Machinery and vehicles must be serviced in dedicated areas that are bunded and that drip trays are in place in the event of a leak detected to capture the spillage and avoid soils from being contaminated; and ▪ Stockpiles must be covered with a plastic liner to prevent erosion from occurring.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	3	3	3	6	Medium-Low (54)
Post-Mitigation	2	2	3	4	Low (28)

Table 3-10: Fauna and Flora Impacts during Drilling

Criteria	Details / Discussion				
Description of impact	▪ Loss of vegetation communities; ▪ Loss of biodiversity and habitat fragmentation; ▪ Faunal species may disperse from the area due to loss of habitats, as well as due to the generation of noise from the drilling activities; ▪ Increase and encroachment of alien invasive species; and ▪ Direct impact on Threatened Ecosystems of the Sekhukhune Plains Bushveld and the Sekhukhune Mountain Bushveld.				
Mitigation required	▪ Remove alien invasive species as and when they occur; ▪ Maintain drilling equipment and, if possible, fit silencing equipment; and ▪ Fence off the Prospecting site to ensure the footprint of the Prospecting site does not increase and all activities and personnel to remain on the established site.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	1	3	3	5	Low (35)
Post-Mitigation	1	2	2	4	Low (20)

Table 3-11: Surface Water Quality Impacts during Drilling

Criteria	Details / Discussion				
Description of impact	▪ Increased turbidity and sedimentation as a result of dust and soil erosion; ▪ Pollution of water due to the evidence of domestic waste and possible spillages from the ablution facilities; and ▪ Contamination due to hydrocarbon spillages.				
Mitigation required	▪ Only clear vegetation when and where necessary; ▪ Rubbish bins and bags will be placed on site for the separation and storage of waste and be removed by the drilling contractor daily; ▪ Domestic waste will be disposed of at a registered waste handling facility and any spillages from the ablution facilities must be cleaned-up; and ▪ Topsoil stockpiles should be covered with a plastic liner so as to prevent erosion; and ▪ Contain and clean up hydrocarbon spillages immediately.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	3	2	2	4	Low (28)
Post-Mitigation	2	1	2	3	Low (15)

3.3.3 Activity: Rehabilitation

Table 3-12 to Table 3-14 display the potential impacts, the significance of the impacts, mitigation measures for such impacts and the significance of the impacts once mitigation has been implemented during the activity of Rehabilitation.

Table 3-12: Soil Impacts during Rehabilitation

Criteria	Details / Discussion				
Description of impact	▪ Soil could wash away into drainage and water systems should backfilling and levelling not take place; and ▪ The site will be compacted due to heavy machinery and personnel movement on the site, affecting land capability.				
Mitigation required	▪ Sump will be backfilled and the site levelled immediately after drilling has concluded; and ▪ All compacted area will be ripped to loosen the soils during rehabilitation and seeded with an appropriate seed mixture.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	3	3	2	6	Medium-Low (48)

Criteria	Details / Discussion				
Post-Mitigation	1	1	2	2	Low (8)

Table 3-13: Flora and Fauna Impacts during Rehabilitation

Criteria	Details / Discussion				
Description of impact	▪ Rehabilitation of drill sites ▪ Planting of suitable rehab grass and tree species ▪ Removal of all rubble.				
Mitigation required	▪ Remove alien invasive species as and when they occur; ▪ All compacted area should be ripped to loosen the soils during rehabilitation and seeded with an appropriate seed mixture; and ▪ Rehabilitation will be monitored by the contactor, during and after the rehabilitation has taken place.				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	1	3	3	5	Low (35)
Post-Mitigation	1	2	2	3	Low (15)

Table 3-14: Surface Water Quality and Quantity Impacts during Rehabilitation

Criteria	Details / Discussion
Description of impact	▪ Increased dust and soil erosion during the removal of equipment could lead to sedimentation of the surface water resources; ▪ Pollution of water due to the evidence of domestic waste and possible spillages from the ablution facilities; ▪ The mobilisation of contaminants that have not been effectively cleaned-up and remediated; and ▪ The decommissioning of sump could result in the mobilisation of materials that leaked during the drilling activities.
Mitigation required	▪ The site and access roads will be kept moist to avoid the creation of dust; ▪ Rubbish bins and bags will be placed on site for the separation and storage of waste and be removed by the drilling contractor daily; ▪ Domestic waste will be disposed of at a registered waste handling facility and any spillages from the ablution facilities must be cleaned-up; and ▪ All hydrocarbon spillages will be adequately clean-up and the site should be inspected by a supervisor during rehabilitation.

Criteria	Details / Discussion				
Parameters	***Spatial***	***Duration***	***Severity***	***Probability***	***Significant rating***
Pre-Mitigation	3	2	3	5	Medium-Low (40)
Post-Mitigation	1	1	2	3	Low (12)

3.4 Assessment of Potential Cumulative Impacts

Cumulative impacts were discussed in Section 2.2.2 above and are assessed on a qualitative scale.

Cumulative impacts, should they occur, have been assessed as indicated in Table 3-15. It should be noted that cumulative impacts will only occur if site specific impacts take place and no mitigation is employed or effective. Based on the nature of the Prospecting activities, it is unlikely that significant cumulative impacts will occur.

Table 3-15: Cumulative Impact Assessment

Impact	Cumulative Impact Rating	Mitigation Measure
Surface Water	Low to Medium-Low	Mitigation is possible at the source which will reduce the likelihood of this cumulative impact.
Soil Erosion	Low	Should this impact occur, is will be of low significance on a regional scale. Mitigation is possible.
Introduction of Alien Species	Low to Medium-Low	Alien species can be introduced by equipment brought onto site. Should this impact occur, all Prospecting sites could be vulnerable to alien invasive floral species. Mitigation is possible.
Elevated Noise Levels	Low	Should noise levels exceed 45 dB (Decibels) during the daytime, a cumulative impact may be experienced. Mitigation is possible by limiting operations to daytime hours, especially close to residential and livestock areas.

Impact	Cumulative Impact Rating	Mitigation Measure
Increased Dust Levels	Low	Mitigation is possible by maintaining topsoil stockpiles and ensuring that the stockpiles are covered during windy and rain days. Access roads should be kept moist.

3.5 Proposed Mitigation Measures to Minimise Adverse Impacts

The mitigation measures for each impact per activity have been discussed in Section 3.1.2 above, following the description of each impact.

3.5.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation

Prospecting via diamond core drilling methods has limited impacts on the environment. All impacts are considered to be of Low to Medium-Low significance, as assessed in accordance with the methodology provided.

The list of actions or activities with the potential impacts with the highest significance is as follows:

- **Site clearing:** Disturbance of vegetation will cause soil erosion and habitat degradation;
- **Drilling:** Drill fluid is circulated throughout the drilling process and is utilised to cool the drill. The fluid could spill into the environment and cause soil, ground and surface water pollution, if not managed correctly;
- **Access roads:** The use and establishment of the access roads could result in an increase of dust and potential soil erosion;
- **Use of hydrocarbons:** Hydrocarbons, used in vehicles for site clearing, as well as during the drilling process in the drill rig, could impact on the soil, ground and surface water should spillages occur;
- **Ablution facilities:** Portable chemical toilets will be made available for the crew of the drill rig. If spillages were to occur it could impact on the soil, ground and surface water resources; and
- **Domestic waste:** Should domestic waste not be adequately removed and disposed of at a registered municipal waste handling facility, it could cause soil, ground and surface water pollution.

3.5.2 Concomitant list of Appropriate Technical or Management Options

3.5.2.1 Environmental Mitigation Measures

The prospecting activities will have Low to Medium-Low impacts on the receiving environment. Prospecting sites to be impacted upon will be small in size, approximately 10 m by 10 m. However, in the event of an impact occurring, the following should be done:

- In the event of a major hydrocarbon spill, all Prospecting operations at the specific site should be stopped and the spill contained and cleaned up immediately. Bioremediation measures should be employed to clean contaminated soil using the correct procedures;
- Avoid establishing prospecting sites within the Ea20 Land Type as the occurrence of Swartland and Valsrivier soils are highly susceptible to erosion;
- Topsoil should be stockpiled on-site and not exceeding a height of 1 m. The stockpile should be covered with a plastic liner to prevent wind and water erosion from occurring;
- Should the site show signs of soil erosion, daily inspection will be required. In the event of topsoil erosion, soil should be placed back onto the topsoil stockpile with additional mitigation measures to be employed, such as berm construction Only the footprint areas, no greater than 10m X 10m earmarked for the temporary prospecting site and contactor's camp (if any) should be cleared of vegetation. The area should be fenced off to ensure that the surrounding areas are not impacted upon in terms of vegetation destruction, due to the Prospecting activities. Tracks and access roads should follow the same procedure, with the establishment of the access roads following the shortest possible route from existing roads;
- Noise and dust pollution could be a significant impact. Should any complaints be received from the public, drilling should stop until the problem has been resolved and both parties have come to an agreement. Soil stockpiles and access roads should be monitored to ensure that the soils are kept moist to prevent excessive soil particles from being carried away due to wind and vehicular activity;
- No prospecting activities should take place within 32 m of any watercourse and a buffer of 100 m should be undertaken from all built infrastructure;
- Dust suppression methods should be implemented to reduce impacts related to dust, such as keeping access roads and topsoil stockpiles moist;
- Ensure that spillage control kits, to contain the mobilisation of the contaminants from the point of spillage, are available on-site for each of the associated activities; Site clearance, drilling and rehabilitation.
- The sump should be constructed by authorised personnel to ensure the most suitable design is implemented. Furthermore, the plastic lining used in the sump should be the correct material and size to adequately line the sump for use during drilling;

- Ensure that trained personnel undertake the drilling and that a supervisor is on site to implement the mitigation measures;
- Implement site clearance, rehabilitation, sign-off and monitoring as and when Prospecting is completed at a specific Prospecting drill site;
- Trained personnel should undertake the rehabilitation of the sites and perform surface inspections to detect any pro-longed leaks or spillages that may have taken place on the environment;
- The disposal of the various materials and waste should be at the correct disposal facilities and undertaken by accredited contractors and the disposal certificates are to be submitted for record keeping;
- Trained personnel should undertake sump clearing and different materials (such as oil, sludge and water) should be disposed of in the relevant, and clearly marked, containers for the appropriate disposal;
- Site inspection should be carried out and all completed work should be recorded in a log-book; and
- Where rehabilitation has not been effective, the associated soil erosion should be mitigated by installing silt traps in areas where the surface runoff enters the surface water resources.

3.5.2.2 Heritage Mitigation Measures

Based on the results of a heritage desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Project. No significant heritage resources were identified within 100 m of the proposed prospecting borehole locations during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, EFC sites, burial grounds and historical structures, though none were identified within 100 m of the prospecting borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey.

Chance Finds Procedures (CFPs) must be developed that clearly describes the process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place.

Project specific monitoring and management measures must be developed as a condition of authorisation. The protocol must detail required monitoring activities, ideally during construction, administrative reporting structures and management / mitigation measures in the event of damage to structures generally protected under section 34 - 37 of the NHRA.

It is recommended that detailed CFPs must be developed, but as minimum, the following be included:

- The Environmental Control Officer and/or contractors must inspect groundworks during site clearance;
- Should any heritage resources be uncovered during site clearance, the find must be stabilised and the site must be secured to protect it from further damage;
- The find must be reported and a qualified archaeologist must be contacted to assess the find; and
- Should the find be significant, a report must be written regarding the find and any mitigation measures conducted. The report will include recommendations for any additional specialist work that may be necessary, or request approval to continue with the development.

3.5.3 Review the Significance of the Identified Impacts

Refer to Section 3.1.2 where the impacts were assessed before and after mitigation for each activity. The mitigation measures and impact description are also discussed in Section 3.1.2.

4 Regulation 52 (2) (d): Financial provision

4.1 Plans for Quantum Calculation Purposes

Refer to Appendix A which outlines the proposed prospecting area. The aerial extent of the Prospecting activities is depicted in Plan 3.

Non-invasive Prospecting methods will identify possible and future Prospecting drill sites. It is currently anticipated that there will be four (4) drill sites over the course of the Prospecting project; the precise sequencing for the drilling programme will be established during the initial phase. These sites will be approximately 10 m by 10 m and will require rehabilitation and monitoring. A sump will be constructed on-site to accommodate oil, water and sludge and approximately 6 m^3 of soil will be removed for this purpose. Rehabilitation will be site specific surface area rehabilitation.

4.2 Alignment of Rehabilitation with the Closure Objectives

To align the rehabilitation initiatives with the closure objectives, it is imperative firstly to define the closure objectives. Closure objectives are defined as follows:

- The holder of a Prospecting Right must, as far as it is reasonably practicable, rehabilitate the environment affected by the Prospecting operation to its natural or predetermined state, or to a land use which conforms to the generally accepted principle of sustainable development, through: restoration, remediation, rehabilitation and stabilisation;

- Correct allocation of closure funds according to the closure plan and ensure adequate financial provision;
- To ensure that good water quality is maintained on site; and
- Monitoring will continue until such a time that it can be proven that there are no more negative impacts on the environment and site closure can be achieved.

In line with the above objectives, rehabilitation will include:

- All evidence of impacts associated with, or resulting from Prospecting should be rehabilitated;
- Sites should be left free of waste and in a stable condition;
- All the soil that has been removed by the drilling activity should be replaced and shaped, and those areas affected by drilling will then proceed to be rehabilitated;
- Soil and surface rehabilitation must be conducted in such a way as to ensure that the site is left stable with no further impacts relating to soil erosion;
- The topography of the disturbed area should be reinstated to its former natural state as far as possible;
- All new tracks will be rehabilitated to their predetermined state;
- All boreholes will be sealed in accordance with the DMR Guidelines;
- Monitoring the success of rehabilitation, such as vegetation establishment, should be conducted preferably monthly but no less than on a quarterly basis ensure that the sites have been rehabilitated successfully. Monitoring should continue t until the closure objectives have been met; and
- Should rehabilitation prove to have been unsuccessful, an additional fertilisation and seeding programme must be followed by a qualified ecologist.

4.3 Quantum Calculations

The environmental closure liability for the prospecting activities was calculated according to the DMR's "Guideline Document for the Evaluation of the Quantum of Closure-related Financial Provision Provided by a Mine".

A closure cost model will be compiled using Microsoft Excel. The matrix model will consist of an input sheet, containing measurements of the disturbed areas and a standard rate sheet.

The rates used were updated by quotes from demolition and civil contractors and professionals wherever possible. Rate formulation takes into consideration the total labour costs, plant costs, fuel costs and construction costs into consideration thus providing a more accurate, defendable rate.

The quantum calculations have been undertaken with a conservative approach and assumed a disturbed area of 100 m^2 for the drilling areas; the conservative approach makes provision for areas which may be disturbed during the prospecting areas such as tracks and temporary roads. In addition, monitoring and reporting costs have been included into the quantum calculations, as outlined in Table 4-1.

Table 4-1: Quantum Calculations

Financial Revision Calculation - Rehabilitation					
Item		**Unit**	**Quantity**	**Rate**	**Cost**
1	Sump (4 m^3)				
	Topsoil	m^3	6	R 59.80	R 358.80
	Fill Sump	Labour	1	R 168.00	R 168.00
2	Drill Area (10 m by 10 m)				
	Re-vegetate	ha	0.01	R 24 775.38	R 247.75
	Rip area[3]	m^2	100	R 6.68	R 668.00
	Shape	ha	0.01	R 1 533.00	R 15.33
3	Borehole				
	Fill Borehole (100 m)	m^3	7	R 19.11	R 133.77
	Concrete	m^3	0.7	R 30.28	R 21.19
4	General Clean-up	Labour	1	R 168.00	R 168.00
5	Hydrocarbon clean-up	m^3	5	R 89.12	R 445.60
6	Inspection	Hours	1	R 870.00	R 870.00
7	Audit				

[3] A mobilisation fee for the equipment hire will need to be included.

Financial Revision Calculation - Rehabilitation							
	Item	**Unit**	**Quantity**	**Rate**		**Cost**	
	Site Inspection	Hours	4	R	470.00	R	1 880.00
	Report Writing	Hours	4	R	470.00	R	1 880.00
				Total		**R**	**6 856.44**
	Grand Total (Total multiplied by 4 Boreholes)		4	**Grand Total**		**R**	**27 425.76**

4.4 Undertaking to provide Financial Provision

The amount provided above, in Section 4.3, will be made available as a Bank Guarantee on approval of this EMP Report.

5 Regulation 52 (2) (e): Planned Monitoring and Performance Assessment of the Environmental Management Plan

5.1 List of Identified Impacts requiring Monitoring Programmes

The following are identified impacts which require monitoring programmes:

- Site clearing and drilling: Removal of vegetation;
- Drilling: Soil erosion;
- Drilling: Dust and noise;
- Drilling: Water generated;
- Drilling: Cleaning of machinery before relocating to another site to prevent the spread of alien invasive floral species;
- Heritage landscape;
- Hydrocarbon spillages;
- Ablution facilities;
- Domestic waste; and
- Fires.

5.2 Functional Requirements for Monitoring Programmes

The functional requirements for the above monitoring programmes are described below:

- Removal of vegetation: Vegetation cleared from the site will be stored adjacent to the prospecting site and removed from the site should it not be adequate for use during rehabilitation. Only the necessary vegetation, required for the establishment of the site, will be cleared and indigenous trees will be avoided;
- Soil erosion: All topsoil removed will be stored in a stockpile and protected from erosion for use during the rehabilitation. Daily site inspection by the site manager will take place to ensure that all soil erosion mitigation measures are in place;
- Dust and noise: Roads should be sprayed with water to suppress dust and the soil stockpiles will be covered with a plastic liner. The drill should be maintained and serviced regularly, and a silencing system should be fitted, if possible. Drilling is to only take place between sunrise and sunset;

- Water generated: Water generated from the drilling should be captured and treated as hazardous waste, since drill fluids will be present in the water;
- Machinery: Cleaning of machinery and equipment will be performed in a dedicated area to avoid the spread of alien invasive floral species to other areas and will take place before leaving the Prospecting site;
- Access roads: Machinery operators and drivers should be made aware of the possible safety hazards that they could pose;
- Heritage landscape: A CFP should be implemented during site establishment in the event that Heritage Resources are discovered;
- Use of hydrocarbons: During drilling, a spill tray will be placed under the machinery to collect any hydrocarbon leaks and spillages. Should spillages occur, the soil will be removed and treated as hazardous waste using bioremediation techniques. Should the soil not be adequately treated on-site, the soil should be removed from the site and disposed of at a waste handling facility;
- Ablution facilities: The contents of the chemical toilets should be emptied on a regular basis, at least weekly, to prevent spillages;
- Domestic waste: Bins will be placed at each site to collect the domestic waste and will be disposed of at a registered waste handling facility. The waste in the rubbish bins will be removed on a daily basis by the contractor;
- Wetlands will be avoided; and
- No open fires are permitted in the Prospecting project area.

5.3 Roles and Responsibilities for the Execution of Monitoring Programmes

Supervisors should be appointed to monitor the potential impacts of the above mentioned activities and Project Managers will foresee that all the management plans are implemented. Mawetse (SA) will appoint an independent Environmental Control Officer (ECO) to conduct a site visit during the drilling programme to assess the compliance with the EMP. Once the Prospecting activity has been completed, the ECO will conduct a site visit to audit the rehabilitation, from which a report will be compiled and submitted to the DMR.

5.4 Committed Time frames for Monitoring and Reporting

The committed frequency for monitoring the potential impacts is outlined in Table 5-1 below.

Performance Assessment monitoring and reporting will be conducted on an annual basis, as prescribed by and submitted to the DMR. General environmental monitoring, however, will be continuous throughout the Prospecting operations.

Table 5-1: Frequency of Monitoring Per Potential Impact

Potential Impact	Frequency of Monitoring
Removal of vegetation	Daily
Soil erosion	Daily
Dust and noise	Daily
Water generated	Daily
Cleaning of machinery	Before moving off the Prospecting drill site
Access roads	Daily
Heritage landscape	Daily during site establishment
Use of hydrocarbons	Daily
Ablution facilities	Weekly
Domestic Waste	Weekly
Rehabilitation	After the completion of each Prospecting activity

6 Regulation 52 (2) (f): Closure and Environmental Objectives

6.1 Rehabilitation Plan

The rehabilitation of the drilling sites will include the removal of all waste and equipment off site, with the drill hole being backfilled with cement, sealed and the hole covered, topsoil spread across the site and vegetated with indigenous vegetation. All impacted and disturbed areas will be rehabilitated to ensure there are no residual impacts as a result of the prospecting activities and accessing of the auger sites. The extent of the rehabilitation is expected to be 100 m^2 per drill hole, with a maximum of four drilling holes established over the period of 3 years. Financial provision has been calculated to assume a disturbed area of 10m by 10m to take a conservative approach, as well as to take into account potential disturbed areas during site access. Each prospecting site will be rehabilitated immediately following the conclusion of the drilling at each site.

Table 6-1 includes recommendations to be followed during rehabilitation of the Prospecting drill sites.

Table 6-1: Recommendations with respect to the rehabilitation of the prospecting drill sites

Time Frame Following the Conclusion of Drilling	Recommendations
Week 1	▪ Water from the sump should be pumped into water drums/tanks for re-use; ▪ Sludge remaining in the sump on the plastic liners should be removed by shovels and disposed of in bins for final disposal off-site; ▪ Plastic liners should be folded (to prevent sludge spills) and disposed of in bins for final disposal off-site; ▪ Grease should be disposed of in used oil drums for disposal off site; ▪ The sump should be closed by backfilling with stockpiled subsoil: and ▪ Topsoil should be spread over the backfilled area.
Week 2	▪ Site inspection by drill site manager to determine the need for the application of degreasers and soil fix kits; ▪ If required, the application of degreasers should be done and the area levelled as best as possible; and ▪ The borehole should be sealed and pegged.
Week 3	▪ Final site inspection and levelling of the area; and ▪ Determine the need for additional rehabilitation.
Week 4	▪ The site should be ready for sign-off

6.2 Closure Objectives and their Extent of Alignment to the Pre-Mining Environment

The closure objectives have been formulated for the prospecting activities and take into account the baseline environment of the Project site. The closure objectives for the proposed Mawetse Prospecting Right:

- Ensure that the drilling sites are rehabilitated with indigenous vegetation;
- Monitor vegetation establishment to ensure that no erosion occurs and the site is stable; and
- The drilling sites should emulate the pre-prospecting environment.

The extent of the prospecting activities is limited, with each prospecting site being 100m^2 in area and a maximum of 4 four drilling sites being established over a 3 year period. The rehabilitation and closure of the drilling sites will be undertaken and strive to restore the sites to the pre-prospecting environment. The drilling sites will be rehabilitated with indigenous vegetation.

6.3 Confirmation of Consultation

As part of the PPP, this Prospecting Right Environmental Management Plan, along with the closure objectives, will be provided to I&APs for review and stakeholders will be able to provide comment.

7 Regulation 52 (2) (g): Record of the Public Participation and the Results thereof

7.1 Identification of Interested and Affected Parties

7.1.1 Name the community or communities identified, or explain why no such community was identified

The Prospecting Right area applied for is located approximately 13 km from Steelpoort, in the Greater Tubatse Local Municipality within the Sekhukhune District Municipality, Limpopo Province. Ga-Maroga Community (located north-east on Mooihoek 255 KT); and Ga-Mohlala Community (located west on Driekop 253 KT).

The proposed Prospecting activities will occur on the following farms (Table 7-1):

Table 7-1: Farms included in the Prospecting Right Application

Application number	Farms
LP 2530 PR	Farm Mooihoek 255 KT; and Farm Driekop 253 KT

7.1.2 Specifically state whether or not the Community is also the Landowner

The Bapedi Ba Tswako Mohlala Tribe is the landowner of Driekop 253 KT, as indicated by Windeed searches undertaken. Portions within the Mooihoek 255 KT farm do not belong to communities, as per Windeed searches undertaken.

7.1.3 State whether or not the Department of Land Affairs has been identified as an Interested and Affected Party

In compliance with paragraph 3 (3.3) of the Department of Mineral Resources (DMR) acknowledgement letter dated 9 November 2015, the Department of Rural Development and Land Reform (Regional Land Claims Commission Limpopo Province and the Land Reform Office) has been identified as an Interested and Affected Party and contacted by means of email and telephone respectively.

Below are the needed contact details used as part of the engagement process:

- Department of Rural Development and Land Reform, Gladys Mogale, (015) 287 6300, gladys.kekana@drdlr.gov.za ; and
- Land Requisition, Thabo Mphelo Tel: (015) 284 7430or e-mail: mphelot@dpw.limpopo.gov.za.

Makhanana Senwana from the Department of Rural Development and Land Reform was consulted on 8 December 2015, and indication was given that response regarding the project will be provided.

7.1.4 State specifically whether or not a land claim is involved

A letter requesting confirmation on possible land claims on the farms Mooihoek 255 KT and Driekop 253 KT respectively was sent by Digby Wells to the Department of Rural Development and Land Reform (see Section 1.3 above) by email correspondence on 03 December 2015. The purpose of the letter was to enquire if there are any land claims on the farm and the respective farm portions on the farms Mooihoek 255 KT and Driekop 253 KT. This request was also followed up with via telephone and information from the Land Claims Commission is pending.

7.1.5 Name the Traditional Authority identified

Two Traditional Authorities were identified:

- Ga-Maroga Tribal Council; and
- Tswako Mohlala Tribal Council.

7.1.6 List the landowners identified by the applicant (Traditional and Title Deeds owners)

Identification of landowners was conducted by means of Windeed searches, consultation with landowners, networking and consultation undertaken with the Tribal Councils. These landowners are included as part of the Stakeholder Database (see Appendix B). The landowners identified, affected and surrounding the prospecting right application area are listed as per Table 7-2 below.

Table 7-2: Directly affected and adjacent landowners

Farm Property	Number	Title Deed Owner	Contact Person
Directly Affected Farm Properties			
Mooihoek 255 KT	Portion RE/255	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 1	Republic of South Africa	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 2	Republic of South Africa	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 3	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 4	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 5	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 6	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 7	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 8	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Driekop 253 KT	Portion 253	Bapedi Ba Tswako Mohlala Tribe	Kgoshi Mohlala
Adjacent Farm Properties			
Clapham 118 KT	Portion RE/118	South African Development Trust	Mr Thabo Mphelo
Twyfelaar 119 KT,	Portion RE/119	National Government of the Republic of South Africa	Mr Thabo Mphelo
Winnaarshoek 250 KT	Portion 250	Government of Lebowa	Mr Thabo Mphelo
De Kom 252 KT	Portion 252	National Government of the Republic of South Africa	Mr Thabo Mphelo
Maandagshoek 254 KT	Portion 254	Republic of South Africa	Mr Thabo Mphelo
Groothoek 256 KT	Portion RE/256	National Government of the Republic of South Africa	Mr Thabo Mphelo
Groothoek 256 KT	Portion 1 /256	National Government of the Republic of South Africa	Ms Gladys Mogale
Schlickmanskloof 258 KT	Portion 2/258	National Government of the Republic of South Africa	Mr Thabo Mphelo

Farm Property	Number	Title Deed Owner	Contact Person
Winnaarshoek 250 KT	Portion 250	Bapedi Ba Tswako Mohlala Tribe	Kgoshi Mohlala
Derge Gelid 278 KT	Portion RE/278	Government of Lebowa	Mr Thabo Mphelo
Derge Gelid 278 KT	Portion 2/278	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Derge Gelid 278 KT	Portion 4/278	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Winnaarshoek 250 KT	Portion 250	Government of Lebowa	Mr Thabo Mphelo
Hendriksplaats 281 KTP	Portion 281	Modikwa Platinum Mine Pty Ltd	Mr James Ndou
Garatouw 282 KT	Portion RE/282	National Government of the Republic of South Africa	Mr Thabo Mphelo
Hendriksplaats 281 KT	Portion 281	Rustenburg Pharmaceutical Suppliers Pty Ltd	Ms Gladys Mogale
Garatouw 282 KT	Portion RE/282	Republic of South Africa	Mr Thabo Mphelo

7.1.7 List the lawful occupiers of the land concerned

The lawful land occupiers were represented by the traditional authorities that are listed in Section 7.1.5 above.

7.1.8 Explain whether or not other persons' (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and, if not, explain why not

It is not anticipated that the proposed prospecting operations will impact on the current socio-economic conditions of adjacent or non-adjacent landowners. Limits of the proposed prospecting area (i.e. the entire application area) is not heavily populated and prospecting activities, which mainly consists of drilling, will only affect small surface areas (approximately 10 x 10 m) and these are localised and are completed in a short period of time.

It is the intention that prospecting activities will be undertaken over a period of two years and will be carried out in the following stages:

- Stage 1: desktop review, soil and rock sampling and geological interpretation; and
- Stage 2: laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

It is not envisaged that more than four boreholes will be drilled and none will be within 100m of a river or wetland. The precise location of the boreholes will be determined during Phase 1.

7.1.9 Name the Local Municipality identified by the applicant

The Greater Tubatse Local Municipality has been identified and is located within the Sekhukhune District Municipality.

7.1.10 Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project

The relevant Government Departments, agencies and institutions are listed below and more information is included as part of the Stakeholder Database (Appendix B).

- Department of Agriculture , Forestry and Fisheries (DAFF);
- National Department of Environmental Affairs;
- Limpopo Department of Economic Development, Environment; and Tourism (LEDET);
- National Department of Water and Sanitation;
- Limpopo Department of Water and Sanitation;
- Limpopo Department of Labour;
- Limpopo Department of Public Works;
- National Department of Agriculture;
- Limpopo Department of Agriculture;
- Limpopo Department of Mineral Resources;
- Limpopo Heritage Resources Authority (LIHRA);
- South African Heritage Resources Agency (SAHRA);
- Provincial Land Claims Commissioner;
- South African National Road Agency – Northern Region;
- Greater Tubatse Local Municipality; and
- Greater Sekhukhune District Municipality.

7.1.11 Submit evidence that the landowner or lawful occupier of the land in question, and any other Interested and Affected Parties including all those listed above, were notified

The following consultation techniques were used to ensure that interested and affected parties were notified of this application:

- The Public Participation (PP) team conducted a site visit on Sunday, 6 and Monday, 7 December 2015 in an effort to consult with the Leadership of directly affected communities. During this process, Background Information Letters (BILs) with attached Registration and Comment Form were distributed to the respective Leaders and Council. These documents were also members as well as disseminated at public places;
- Site notices were placed the proposed prospecting site boundaries and public places on 07 December 2015;
- One newspaper advertisement was published on the Steelburger in English on 4 December 2015; and
- The Background Information Letter (BIL) with the Registration and Comment Form was emailed to stakeholders.

Included in these materials was information of the applicant, the project description and proposed timeframes, locality setting, legislative framework in accordance to the requirements of the MPRDA and the PP process to be followed with the needed contact details stakeholders can use to formally register as Interested and Affected Parties (I&APs) on the project.

7.2 The Details of the Engagement Process

7.2.1 Description of the information provided to the community, landowners, and interested and affected parties

Refer to Appendix B for the Stakeholder Database for a list of the identified I&APs. Proof of emails sent to the I&APs are included in Appendix B. Site Notices were placed at the roads entering the boundaries of the Prospecting project area. In addition, the leadership of all directly affected communities Table 7-2, were notified via direct consultation during a site visit to the area on 6 and 7 December 2015.

7.2.2 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment

All registered I&APs will be offered the opportunity to review the Environmental Management Plan (EMP) for their comments and inputs – the EMP will be placed on the Digby Wells website. The EMP will be provided for public comment following submission to the DMR, which is anticipated to be done during January 2016.

It is noted that the adjacent landowner owning Hendrikplaats 281 KT, Modikwa Platinum Mine Pty Ltd, was contacted repeatedly via telephone, as a follow-up to the formal project announcement via email – unfortunately no response was given to these telephone calls. Other directly affected and adjacent landowners have either been consulted or indicated that comments will be submitted.

Comments received to date have been consolidated and are listed in Table 7-3 below.

Table 7-3: Public Participation Activities

Contributor	Date	Comment Raised	Category
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be on dust?	Air Quality
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Investigations must be done on graves.	Heritage
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We have vacant and occupied land; an investigation is also needed to determine who some of this lands belong to.	Land Value / Use and Ownership
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Farming land needs to be taken into consideration.	Land Value / Use and Ownership
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be from noise?	Noise
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be on groundwater?	Water - Ground
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	It is a good proposal because it will help our communities, our people need jobs.	Socio-economic - Employment
Mr Solly Mphago Tswako Mohlala Tribal Council	06-Dec-15	Even at this stage communities will need to know, although it isn't a project yet, how many jobs will be created for the local people.	Socio-economic - Employment
Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	A project of this caliber is good for the community and our people need jobs, but things need to be done according to protocol.	Socio-economic - Employment
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We need to put in place a strategy on how to consult with the communities.	Public Participation

Contributor	Date	Comment Raised	Category
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Mawetse Mining and its environmental consultants need to work together with communities from the beginning of the application.	Public Participation
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Communities need to be aware that this is engagement is for the prospecting right application consultation phase.	Public Participation
Mr Selatole Moretsele Tswako Mohlala Tribal Council	06-Dec-15	There is a need of consultation with Induna's so they can help Digby Wells to be able to do their work within the community.	Public Participation
Mr Solly Mphago Tswako Mohlala Tribal Council	06-Dec-15	I believe consultation means you need to know the interests of the community you are consulting with -developments within the community.	Public Participation
Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	Ga-Maroga Tribal Authority and the Council need to consult with their Legal experts before they can commit themselves. Hence, the consultant is not allowed to record the meeting and members will not fill in an attendance register.	Public Participation
Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	There are certain structures that are vehicles of the community that need to be involved and they are not in the meeting, only the council.	Public Participation
Council Members Ga-Maroga Tribal Council	07-Dec-15	Timeframes for the consultation was too limited; we need another meeting whereby every structure in the community will be represented.	Public Participation
Mr Paul Maroga Ga-Maroga Tribal Council	07-Dec-15	A date need to be setup for a meeting with all our structures present.	Public Participation
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We are not only concerned about jobs, but several specialists studies need to be done before starting with any development.	Environmental Impact Assessment
Mr Daniel Moretsele Tswako Mohlala Tribal Council	06-Dec-15	Communities will need to know what will be the process after DMR has given feedback on the Prospect Right Application.	Environmental Impact Assessment

Contributor	Date	Comment Raised	Category
Mr Matienyate Moeng Tswako Mohlala Tribal Council	06-Dec-15	Now that Mawetse Mining has background and knowledge of what they want to do in the area, the people working with Kgoshi need to deliver the news to the Induna's so they can go into their communities to deliver the information to avoid misleading information.	Need and Desirability for the Project
Council Members Ga-Maroga Tribal Council	07-Dec-15	We would like to have projects like this in our community as it creates jobs and that we appreciate that Mawetse Mining came to us in the past to discuss what they had in their mind in regards to what they wanted to do.	Need and Desirability for the Project
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Communities and Mawetse need to have a relationship in terms of business should all go well with the application.	General
Mr Mathias Komane Tswako Mohlala Tribal Council	06-Dec-15	In all processes to be done there is a protocol to be followed by all parties.	General

7.2.3 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation

Please refer to Appendix B for the CRR.

7.2.4 Other concerns raised by the aforesaid parties

A summary of concerns raised by the consulted parties is set up in table 7-3. For additional details please refer to the comments and response report in Appendix B

7.2.5 Confirmation that minutes and records of the consultations are appended

Although no meetings were held with the community members they were represented by the Ga-Maroga Tribal Council and Tswako Mohlala Tribal Council who were consulted. Comments received to date, have been consolidated and are listed the CRR (refer to Appendix B).

7.2.6 Information regarding objections received

No objections were received from I&APs.

7.3 The manner in which the issues raised were addressed

The issues raised, as outlined in Section 7.2.3 above, were addressed as set out in the CRR attached in Appendix B.

8 Section 39 (3) (c) of the Act: Environmental Awareness Plan

8.1 Employee communication process

Mawetse (SA) will develop Environmental, Health and Safety Policies. The Environmental Policy will be communicated to all personnel, whether they are contractors or permanent staff, and the policy will be erected at each active Prospecting site.

Employees will receive general environmental awareness training on specific items contained in this EMP, as well as on Best Possible Environmental Practices (BPEP).

8.2 Description of solutions to risks

Each possible potential impact (risk) has been identified in this EMP Report. For each impact or risk, a mitigation measure has been proposed. If employees are trained on these mitigation measures, the likelihood of potential impacts will be reduced significantly.

8.3 Environmental awareness training

Environmental Awareness Training will be undertaken to make employees and contractors aware of the following:

- The importance of conforming with the environmental policy and procedures and with the requirements of the EMP;
- The significant social and environmental impacts of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system;
- The potential consequences of departure from specified operating procedures; and
- Possible archaeological finds, action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery.

Environmental awareness training will be conducted for all personnel at the same time as the required programme. The training material provided will be subject to periodic review, based on issues such as incidents, accidents, new legislative requirements, modified processes and environmental and social aspects identified from time to time. This training is to be carried out and coordinated internally by Mawetse SA.

Mawetse SA will, therefore, develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives and targets.

In addition, an Emergency Preparedness Plan will be communicated to all site personnel during the induction process.

9 Section 39 (4) (a) (iii) of the Act: Capacity to Rehabilitate and Manage Negative Impacts on the Environment

9.1 The annual amount required to manage and rehabilitate the environment

The closure for four boreholes was calculated to be approximately R 27 425.76. Financial provision, which will be reviewed on an annual basis, will for this amount will be provided to the DMR and will be reviewed on an annual basis.

9.2 Confirmation that the stated amount correctly reflected in the Prospecting Work Programme as required

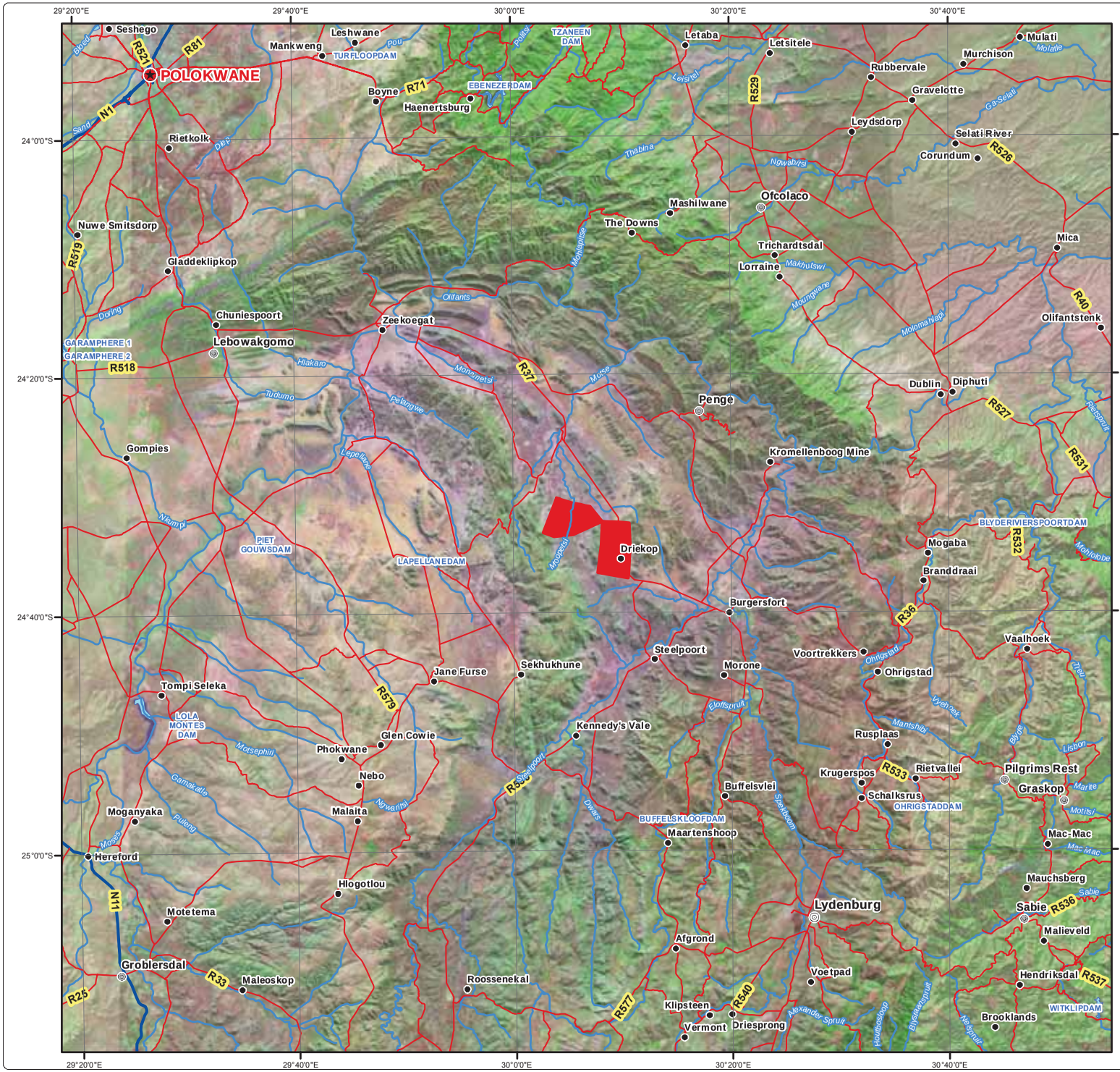
The amount of R 30 000.00 was recorded in the Prospecting Works Programme (PWP). Digby Wells, found this amount to be a reasonable amount to cover the required costs for rehabilitation.

10 Regulation 52 (2) (h): Undertaking to execute the environmental management plan

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.	
Full Names and Surname	Phutiyana William Maponya
Identity Number	4504145445083

-END-

Appendix A: Plans



Plan 1

Mawetse PR EMP

Regional Setting

Legend

- Project Area
- City
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- River
- Dam

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.050
Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 05/01/2016

N

0 5 10 20 30

Kilometres

1:600 000

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Plan 2

Mawetse PR EMP

Local Setting

Legend

- Project Area
- Other Town
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Railway Line
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Local Municipality Boundary

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Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.051
Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 05/01/2016

N

0 2 4 8

Kilometres

1:150 000

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Plan 3

Mawetse PR EMP

Proposed Prospecting Boreholes

Legend

- Proposed Prospecting Borehole
- Project Area
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream
- Farm Boundary
- Farm Portion

DIGBY WELLS ENVIRONMENTAL

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Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.007
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Central Meridian: 31°E	Date: 05/01/2016

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Kilometres

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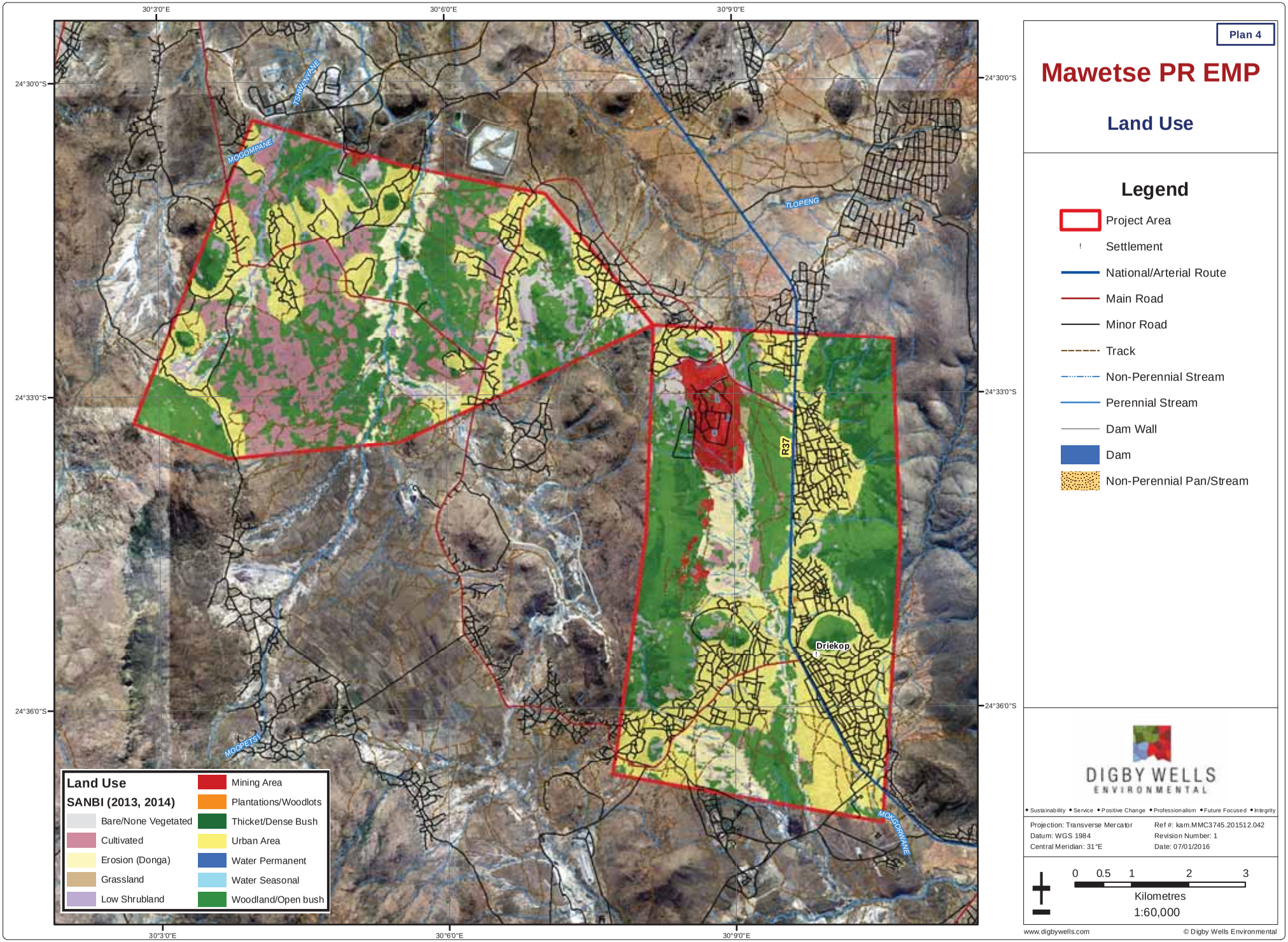

Plan 4

Mawetse PR EMP

Land Use

Legend

- Project Area
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 31°E

Ref #: kam.MMC3745.201512.042
Revision Number: 1
Date: 07/01/2016

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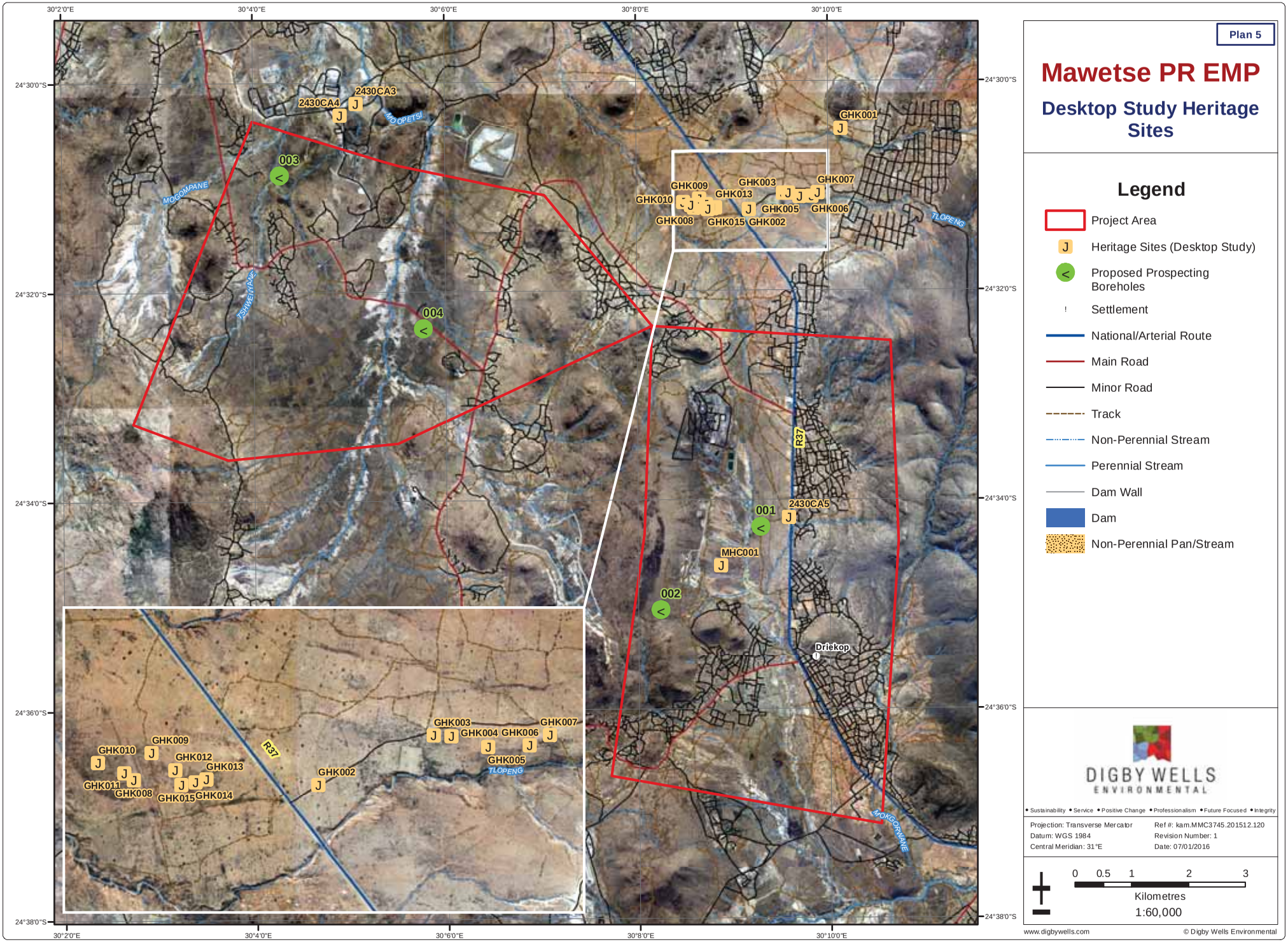

Plan 5

Mawetse PR EMP

Desktop Study Heritage Sites

Legend

- Project Area
- Heritage Sites (Desktop Study)
- Proposed Prospecting Boreholes
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.120
Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 07/01/2016

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Kilometres

1:60,000

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Appendix B: Consultation Report

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

MAWETSE (SA) MINING CORPORATION (PTY) LTD

BASIC ASSESSMENT FOR CHROME ORE, GEMSTONE, VANADIUM ORE, ANDALUSITE AND MAGNETITE PROSPECTING RIGHT APPLICATION, NEAR STEELPOORT, LIMPOPO PROVICE

REPORT ON THE RESULTS OF CONSULTATION

WITH COMMUNITIES AND INTERESTED AND AFFECTED PARTIES

AS REQUIRED IN TERMS OF SECTIONS, 16(4)(b) OR 27(5)(b) OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 OF 2002), AND IN ACCORDANCE WITH THE STANDARD DIRECTIVE FOR THE COMPILATION THEREOF AS PUBLISHED ON THE OFFICIAL WEBSITE OF THE DEPARTMENT OF MINERAL RESOURCES

A. Definitions

‘consultation’ means a two way communication process between the applicant and the community or interested and affected party wherein the former is seeking, listening to, and considering the latter’s response, which allows openness in the decision making process.

‘community’ means a group of historically disadvantaged persons with interest or rights in a particular area of land on which the members have or exercise communal rights in terms of an agreement, custom or law: Provided that, where as a consequence of the provisions of the Act negotiations or consultations with the community, directly affected by prospecting or mining, on load occupied by such members or part of the community:

‘Interested and affected’ parties include, but are not limited to: -

(i) Host Communities
(ii) Landowners (Traditional and Title Deed owners)
(iii) Traditional Authority
(iv) Land Claimants
(v) Lawful land occupier
(vi) The Department of Land Affairs
(vii) Any other person (including on adjacent and non-adjacent properties) whose socio-economic conditions may be directly affected by the proposed prospecting or mining operation)
(viii) The Local Municipality
(ix) The relevant Government Departments, agencies and institutions responsible for the various aspects of the environmental and for infrastructure which may be affected by the proposed project

B. Report on the results of consultation

Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) has applied for a Prospecting Right for Chrome Ore, Copper, Gemstone, Vanadium Ore, Andalusite and Magnetite in respect of the farms Mooihoek 255 KT and Driekop 253 KT, which is being processed by the Department of Mineral Resources (DMR) under Reference No.: LP 2530 PR. A Directive has been received from the Deputy Director General – Mineral Regulation of the Department of Mineral Resources directing Mawetse to notify and consult with landowners and occupiers, to consult with the Department of Land Tenure and Rural Development and the office of the Commissioner of Land Rights, and submit the results of all such consultation to the Deputy Director General. A copy of this Consultation Report is also being submitted to the office of the Regional Manager, Limpopo Region.

The Prospecting Right area applied for is located on the farms Mooihoek 255 KT and Driekop 253 KT, approximately 3 km north-west of Steelpoort, in the Limpopo Province.

1. Methodology applied to consultation

The Public Participation process undertaken is in line with the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and directive received.

1.1 Name the community or communities identified, or explain why no such community was identified.

The communities identified to be affected by the Prospecting Right Application, since these reside within the Prospecting Right Application area, are:

- Ga-Maroga Community (located north-east on Mooihoek 255 KT); and
- Ga-Mohlala Community (located west on Driekop 253 KT).

1.2 Specifically state whether or not the Community is also the landowner.

The Bapedi Ba Tswako Mohlala Tribe is the landowner of Driekop 253 KT, as indicated by Windeed searches undertaken. Portions within the Mooihoek 255 KT farm do not belong to communities, as per Windeed searches undertaken.

1.3 State whether or not the Department of Land Affairs been identified as an interested and affected party

In compliance with paragraph 3 (3.3) of the Department of Mineral Resources (DMR) acknowledgement letter dated 9 November 2015, the Department of Rural Development and Land Reform (Regional Land Claims Commission Limpopo Province and the Land Reform Office) has been identified as an Interested and Affected Party and contacted by means of email and telephone respectively.

Below are the needed contact information used as part of the engagement process:

- Department of Rural Development and Land Reform, Ms Gladys Mogale, (015) 287 6300, gladys.kekana@drdlr.gov.za; and
- Land Requisition, Mr Thabo Mphelo Tel: (015) 284 7430or e-mail: mphelot@dpw.limpopo.gov.za.

Makhanana Senwana from the Department of Rural Development and Land Reform was consulted on 8 December 2015, and he indication that a response regarding the project will be provided in due course.

1.4 State specifically whether or not a land claim is involved

A letter requesting confirmation on possible land claims on the farms Mooihoek 255 KT and Driekop 253 KT respectively was sent by Digby Wells to the Department of Rural Development and Land Reform (see Section 1.3 above) by email correspondence on 03 December 2015. The purpose of the letter was to enquire if there are any land claims on the farm and the respective farm portions on the farms Mooihoek 255 KT and Driekop 253 KT. This request was also followed up with via telephone and confirmation from the Land Claims Commission is pending.

1.5 Name the Traditional Authority identified

Two Traditional Authorities were identified. Refer to *Appendix B* for the Stakeholder Database for a list of interested and affected parties.

- Ga-Maroga Tribal Council (located on Mooihoek 255 KT); and
- Tswako Mohlala Tribal Council (located on Driekop 253 KT).

1.6 List the landowners identified by the applicant (Traditional and title Deed owners)

Identification of landowners was conducted by means of Windeed searches, consultation with landowners, networking and consultation undertaken with the Tribal Councils. These landowners are included as part of the Stakeholder Database *(see Appendix B)*. The landowners identified, affected and surrounding the prospecting right application area are listed as per Table 1 below.

Table 1: Directly affected and adjacent landowners

Farm Property	Number	Title Deed Owner	Contact Person
Directly Affected Farm Properties			
Mooihoek 255 KT	Portion RE/255	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 1	Republic of South Africa	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 2	Republic of South Africa	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 3	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 4	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 5	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo

Farm Property	Number	Title Deed Owner	Contact Person
Mooihoek 255 KT	Portion 6	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 7	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Mooihoek 255 KT	Portion 8	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Driekop 253 KT	Portion 253	Bapedi Ba Tswako Mohlala Tribe	Kgoshi Mohlala
Adjacent Farm Properties			
Clapham 118 KT	Portion RE/118	South African Development Trust	Mr Thabo Mphelo
Twyfelaar 119 KT,	Portion RE/119	National Government of the Republic of South Africa	Mr Thabo Mphelo
Winnaarshoek 250 KT	Portion 250	Government of Lebowa	Mr Thabo Mphelo
De Kom 252 KT	Portion 252	National Government of the Republic of South Africa	Mr Thabo Mphelo
Maandagshoek 254 KT	Portion 254	Republic of South Africa	Mr Thabo Mphelo
Groothoek 256 KT	Portion RE/256	National Government of the Republic of South Africa	Mr Thabo Mphelo
Groothoek 256 KT	Portion 1 /256	National Government of the Republic of South Africa	Ms Gladys Mogale
Schlickmanskloof 258 KT	Portion 2/258	National Government of the Republic of South Africa	Mr Thabo Mphelo
Winnaarshoek 250 KT	Portion 250	Bapedi Ba Tswako Mohlala Tribe	Kgoshi Mohlala
Derge Gelid 278 KT	Portion RE/278	Government of Lebowa	Mr Thabo Mphelo
Derge Gelid 278 KT	Portion 2/278	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Derge Gelid 278 KT	Portion 4/278	Republic of South Africa (Land Requisition)	Mr Thabo Mphelo
Winnaarshoek 250 KT	Portion 250	Government of Lebowa	Mr Thabo Mphelo
Hendriksplaats 281 KTP	Portion 281	Modikwa Platinum Mine Pty Ltd	Mr James Ndou
Garatouw 282 KT	Portion RE/282	National Government of the Republic of South Africa	Mr Thabo Mphelo
Hendriksplaats 281 KT	Portion 281	Rustenburg Pharmaceutical Suppliers Pty Ltd	Ms Gladys Mogale
Garatouw 282 KT	Portion RE/282	Republic of South Africa	Mr Thabo Mphelo

1.7 List the lawful occupiers of the land concerned

The landowners are displayed in Table 1 above.

1.8 Explain whether or not other persons' (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and if not, explain why not

It is not anticipated that the proposed prospecting operations will impact on the current socio-economic conditions of adjacent or non-adjacent landowners. Limits of the proposed prospecting area (i.e. the entire application area) is not heavily populated and prospecting

activities, which mainly consists of drilling, will only affect small surface areas (approximately 20 x 20 m) and these are localised and are completed in a short period of time.

It is the intention that prospecting activities will be undertaken over a period of two years and will be carried out in the following phases:

- Phase 1: desktop review, soil and rock sampling and geological interpretation; and
- Phase 2: laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

It is not envisaged that more than four boreholes will be drilled and none will be within 100m of a river or wetland. The precise location of the boreholes will be determined during Phase 1.

1.9 Name the Local Municipality identified by the applicant

The Greater Tubatse Local Municipality has been identified and is located within the Sekhukhune District Municipality.

1.10 Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project

The relevant Government Departments, agencies and institutions are listed below and more information is included as part of the Stakeholder Database (*Appendix B*).

- Department of Agriculture , Forestry and Fisheries (DAFF);
- National Department of Environmental Affairs;
- Limpopo Department of Economic Development, Environment; and Tourism (LEDET);
- National Department of Water and Sanitation;
- Limpopo Department of Water and Sanitation;
- Limpopo Department of Labour;
- Limpopo Department of Public Works;
- National Department of Agriculture;
- Limpopo Department of Agriculture;
- Limpopo Department of Mineral Resources;
- Limpopo Heritage Resources Authority (LIHRA);
- South African Heritage Resources Agency (SAHRA);
- Provincial Land Claims Commissioner;
- South African National Road Agency – Northern Region;
- Greater Tubatse Local Municipality; and
- Greater Sekhukhune District Municipality.

1.11 Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above, were notified

The following consultation techniques were used to ensure that interested and affected parties were notified of this application:

- The Public Participation (PP) team conducted a site visit on Sunday, 6 and Monday, 7 December 2015 in an effort to consult with the Leadership of directly affected communities. During this process, Background Information Letters (BILs) with attached Registration and Comment Form were distributed to the respective Leaders and Council. These documents were also provided to members as well as disseminated at public places;
- Site notices were placed along the proposed prospecting site boundaries and public places on 07 December 2015;
- One newspaper advertisements was published on the Steelburger in English on 4 December 2015; and
- The BIL with the Registration and Comment Form was emailed to registered stakeholders.

Further detail of the Public Participation (PP) activities is included in Table 2 (Refer to *Appendix C* for copies of the relevant PP information documents issued to the public).

Included in these materials was information of the applicant, the project description and proposed timeframes, locality setting, legislative framework in accordance to the requirements of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and the PP process to be followed with the needed contact details that stakeholders can use to formally register as Interested and Affected Parties (I&APs) on the project.

2. Description of the existing status of the cultural, socio-economic or biophysical environment, as the case may be, prior to the proposed prospecting or mining operation.

The proposed prospecting area covers Wards 7, 8, 10,11,12,17 and 19 of the Greater Tubatse Local Municipality. The area is intersected from the southeast by the R37 road (which runs between the towns of Burgersfort and Lebowakgomo (and Polokwane further to the north-east). The area encompasses portions of the farms Driekop 253 KT and Mooihoek 255 KT.

Locally, Ward 7 appears to be the more densely populated ward, with several villages situated in the area of the Mooihoek 255 KT farm. These villages include Ragopola (in the eastern part of the project area) and Driekop (towards the south). Ward 2, to the south of the Project area, is mostly occupied by commercial farming and mining. The town of Burgersfort is situated about 16 kilometres (km) to the southeast of the prospecting area. It is a rapidly growing town that serves the surrounding mining community and is largely characterised by heavy engineering enterprises, suppliers to the mines, transport facilities, building material suppliers, distributors/wholesale, medium density housing and a small retail component.

The area comprises of undulating topography with rolling hills throughout the property, as well as some larger peaks within the southern part of the prospecting area.
There are occasional farm houses scattered on the proposed farm boundaries and it was noted, during the site visit, that the houses were occupied with farm workers.
Note: Cultural and heritage sites will be confirmed on the conclusion of the Heritage and Archaeological Assessment and the results thereof will be included in the Environmental Management Plan (EMP). Refer to Plan 1 below for Regional and Land Tenure setting of the project area.

Plan 1: Local Setting of the Project

2.1 Confirm that the identified and consulted interested and affected parties agree on the description of the existing status of the environment

Comments received to date have been consolidated and are listed in Table 3. All registered I&APs will be offered the opportunity to review the EMP for their comments and inputs – the EMP will be placed on the Digby Wells website. The EMP will be provided for public comment following submission to the DMR, which is anticipated to be done during January 2016.
It is noted that the adjacent landowner owning Hendrikplaats 281 KT, Modikwa Platinum Mine Pty Ltd, was contacted repeatedly via telephone, as a follow-up to the formal project announcement via email – unfortunately no response was given to these telephone calls. Other directly affected and adjacent landowners have either been consulted or indicated that comments will be submitted.

2.2 Describe the existing status of the cultural environment that may be affected

It is anticipated that the prospecting operations will not have any significant impact on the cultural environment.
In addition a Heritage and Archaeological Study will be conducted, as part of the compilation of the EMP, within the area in question and the results of this study will be included in the EMP Report to be submitted on 9 January 2016.

2.3 Describe the existing status of any heritage environment that may be affected

The Heritage and Archaeological environment of the proposed prospecting area will be investigated by an independent archaeologist, during the compilation of the EMP, and the results of this study will be included in the EMP Report to be submitted on 9 January 2016.

2.4 Describe the existing status of any current land uses and the socio-economic environment that may be directly affected

<u>Regional and local socio-economic background</u>
This section provides socio-economic baseline information on the Greater Tubatse Local Municipal area, which forms the regional backdrop of the proposed project. The municipality was established on 5 December 2000 as part of the Sekhukhune District Municipality. It comprises part of the former Lebowakgomo homeland, and is mainly rural in nature. The surface area of the Greater Tubatse Local Municipality is approximately 229 000 ha. The nearest urbanised settlements are Steelpoort (about 15 km to the south of the project site), Burgersfort (about 16 km to the Southeast).

The local municipality consists of 29 wards. There are currently 15 mines in the Greater Tubatse area, with several more being planned. Other economic activities include agriculture and a nascent tourism industry (ITS Engineers, 2007).

The Prospecting site occupies a surface area of approximately 82 km^2. Of this area, about 40 km^2 is occupied by settlements comprising the villages mentioned above. The estimated total population of the site specific wards is approximately 74 500 people residing in 18 065

households. These settlements are surrounded by subsistence agricultural fields; occupying roughly 10% of the area. The average number of people living in one household (under one roof) is 4.72 and in the site specific area the number of people in one household is 4.1.

Political structures

The villages in the prospecting area are situated on communal land within legally recognised traditional authorities governed by chiefs and their respective tribal councils. It should be noted, however, that the boundaries between traditional authorities' areas of jurisdiction are not always well-defined, as households paying allegiance to different traditional authorities are sometimes interspersed. The population of the prospecting area is therefore subject to two parallel systems of governance: the statutory system (consisting of ward committees, ward councilors, local municipality, etc.) and a customary system (consisting of chiefs, tribal councils, etc.). The ward committees consists of elected members who function as the link between the community and the local municipality, with the latter being responsible for service delivery, development planning and other, related functions. The duties of tribal councils to some extent overlap with those of the ward councils; their responsibilities include dealing with conflicts in the community, presiding over customary court cases, allocating stands to community members, and coordinating development efforts in the community.

Employment and income

Of the municipal population 66% is not economically active (does not work/does not look for work), 21% are unemployed while 13% have employment. Most of the people who are employed work within the Government sector (27%), where they mostly provide services within the health and social development sectors. Mining employs approximately 20% of the employed people, while agriculture accounts for about 12% of employment (GTLM, 2014).

Only approximately 1 295 individuals in the Greater Tubatse Local Municipality earn more than R6 400 per month, with the average income between R1 000 - R2 400 per month. At site specific level only 16% of households earn more than R76 400 suggesting that as much as 84% of the site specific population live in poverty. Economic indicators support the conclusion that the area is a poor and rural (Stats SA, 2013).

Land use

The current land use on the proposed Prospecting Site is agricultural and cattle, sheep and goat farming. Due to the small scope of the Prospecting Sites (20 x 20 m), and the fact that it is anticipated that 4 boreholes will be drilled in Phase 2 (second year), the impacts are expected to be minimal. The location of the proposed boreholes will be communicated to the landowners before drilling commences, however, it is anticipated that the boreholes will be sited in areas away from dense settlements.

2.5 Describe the existing status of any infrastructure that may be affected

No infrastructure is likely to be affected by the proposed prospecting activities. The dwellings existing in the proposed Prospecting Site area are scattered across the area. In addition, no prospecting will take place within 100 m of any existing houses.

Although it is not expected that any infrastructure and services will be impacted by the proposed prospecting activities, this section describes the existence of such services.

Education and health

There are four hospitals in the Greater Tubatse Local Municipality. Together the four hospitals have 376 beds. There are approximately 416 people working in these facilities of which 45% (186) is medical personnel and 55% administrative. In 2005 there were 9 mobile clinics and 5 vehicles and 15 medical personnel who work in these mobile clinics in Tubatse (GTLM, 2014).

Housing and basic services

Seventy-three per cent of the dwellings in Tubatse are formalised, whilst in the site specific area, this equates to 84%. Traditional dwellings (huts) account for 18% but only 3% in the site specific area. The traditional dwellings are mostly located in the rural villages. Informal dwelling accounts for 9% in the Tubatse and 13% in the site specific area (Stats SA, 2013).

Tubatse residents depend primarily on communal water stands and surrounding streams for water: Of these households in the Tubatse area 32% use natural water sources such as rivers and dams, while 51% of households have basic access to water supplies such as the water vendor and communal taps. Of the households in Tubatse 13% have intermediate access to water with water inside their premises, and only 4% of households have full access to water. The Integrated Development Plan of the local municipality stresses the issues around the dangers of inadequate water supplies and the necessity for the provision of clean water (GTLM, 2014).

Of the households in the local municipal area, 47% use electricity for lighting, 47% use candles and 5% use paraffin. In the site specific study area, this is substantially more with 82% making use of electricity for lighting. In terms of sanitation, most households in Tubatse make use of a pit latrine; 25% of households have no sanitation. Only 5% of the households have flush toilets (Stats SA, 2013).

2.6 Describe the existing status of the biophysical environment that will be affected, including the main aspects such as water resources, flora, fauna, air, soil, topography etc.

The site is predominantly used for agricultural purposes, and cattle, sheep and goat farming. Specialist desktop studies will be undertaken within the area and a detailed description will be included as part of the EMP Report, which will be submitted on 9 January 2016.

Specialist Studies will include:

- Fauna and Flora Assessment;
- Wetland Assessment;
- Heritage Assessment;
- Social Assessment;
- Surface water Assessment;
- Closure and Rehabilitation; and
- Soil, Land Use and Land Capability Assessment.

2.7 Provide any relevant additional information

No additional information at this stage.

3. The anticipated environmental, social or cultural impacts identified.

3.1 Confirmation that the community and identified interested and affected parties have been consulted and that they agree that the potential impacts identified include those identified by them

The Ga-Maroga Tribal Council and Tswako Mohlala Tribal Council were consulted. Comments received to date, have been consolidated and are listed in Table 3. All registered I&APs will be offered the opportunity to review the EMP for their comments and inputs. The EMP will be provided for public comment following submission to the DMR, which is anticipated to be done on 9 January 2016.

Appendix C also contains a short report of the site notices placed throughout the project area, together with a site notice map. An advertisement placed in The Steelburger on 04 December 2015 to advertise the prospecting application and to invite I&APs to become involved in the process and to submit their comments

3.1.1 Provide a list and description of potential impacts identified on the cultural environment.

A Social Assessment and Heritage Assessment will be undertaken as part of the specialist studies for the compilation of the EMP Report. Specialist studies will provide detail on the baseline environments of the Prospecting Site, predict and assess potential impacts and provide recommendations for mitigation and management measure.

3.1.2 Provide a list and description of potential impacts identified on the heritage environment, if applicable.

As stated in Section 3.1.1, a Social Assessment and Heritage Assessment will be undertaken as part of the specialist studies for the compilation of the EMP Report. The results thereof will be described in detail in the EMP Report to be submitted to the DMR on 9 January 2016.

3.1.3 Provide a list and description of potential impacts identified on the socio-economic conditions of any person on the property and on any adjacent or non-adjacent property who may be affected by the proposed prospecting or mining operation.

All potential impacts are identified during the compilation of the EMP Report and with the input from specialist studies. The social impacts described below will be incorporated in the EMP report. They are based on an understanding of prospecting activities and how these may impact on the social baseline environment.

- ***Noise and dust impacts:*** There is likely to be an increase in dust and noise generated by project vehicles and prospecting activities. These will cause a nuisance to local residents, in cases where vehicles need to bypass dwellings to reach a drill site. The impact is predicted to be low and to occur intermittently.
- ***Impact to communal land:*** The operations of drilling equipment and support vehicles may unintentionally traverse communal grazing and subsistence agricultural land in order to reach drill sites. This may damage local resources such as grasses and crops. This impact is not expected to be low in significance, as there will be communication prior to the drilling activities taking place.
- ***Increase in project enquiries:*** Once prospecting begins, there will be enquiries from local residents, government authorities and community leaders about the project. It is likely that most enquiries will be about current and future job opportunities. Other enquiries will likely be about nuisance impacts that may be experienced. The impact is predicted to be low. Most enquiries will occur at the start and end of the project.
- ***Job creation:*** There may be some short term employment opportunities for local, low skilled people. This impact is predicted to be low as employment will likely be for a short term, and limited in number, as prospecting is not labour intensive.
- ***Perceived threat of a foreign workforce:*** The presence of a foreign (non-local) workforce may create the perception amongst local people that outsiders pose a threat to their safety, health and way of life. However, the workforce is likely to be small and prospecting is common to the broader area, therefore the workforce poses no real threat to local communities. Social ills that may arise, such as prostitution, theft and the spread of diseases, are likely to be minimal and contained.

3.1.4 Provide a list and description of potential impacts (positive and negative) identified on: employment opportunities, community health, community proximity.

Please refer to Section 3.1.3 above.

3.1.5 Provide a list and description of potential impacts identified on the biophysical environment including but not be limited to impacts on: flora, fauna, water resources, air, noise, soil etc.

As indicated in Section 2.6, specialist studies will include a Heritage Assessment; Fauna and Flora Assessment; Surface Water Assessment; Wetland Assessment; Social Assessment; Soil; Land Use and Land Capability Assessment; Closure and Rehabilitation Assessments.

All potential impacts associated with the biophysical environment will be discussed in detail in the EMP Report to be submitted on 9 January 2016 to the DMR.

3.1.6 Provide a description of potential cumulative impacts the proposed operation may contribute to considering other identified land uses which may have potential environmental linkages to the land concerned.

Please refer to Section 3.1.5 above.

Due to the existence of the surrounding mining operations there is an expectation that any potential mining operations will generate additional employment. This may result in the influx of more jobseekers into the area, placing increased strain on local resources and infrastructure.

4. Land use or development alternatives, alternative means of carrying out the proposed operation, and the consequences of not proceeding with the proposed operation.

4.1 Provide a list of and describe any alternative land uses that exist on the property or on adjacent or non-adjacent properties that may be affected by the proposed mining operation.

The current land use is agricultural and cattle farming. There are generally no alternative land uses that will be impacted by the proposed prospecting. The Dilokong Chrome mine may experience some pressure in cases where prospecting activities are not carried out responsibly. There may be unintentional association with Dilokong, and associated opposition towards them.

4.2 Provide a list of and describe any land developments identified by the community or interested and affected parties that are in progress and which may be affected by the proposed mining operation.

Identification of developments in the area will form part of the specialist studies to be undertaken.

4.3 Provide a list of and describe any proposals made in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and interested and affected parties.

Comments received to date have been consolidated and are listed in Table 3.

4.4 Provide information in relation to the consequences of not proceeding with the proposed operation.

Without holding a Prospecting Right, Mawetse will not be in a position to determine definitively the ore resource on the farms concerned. This may preclude the development of a mineral resource.

5. Description of the process of engagement referred to in 3.2.1 and 3.2.2 above with identified communities, landowners and interested and affected parties.

5.1 Provide a description of the information provided to the community, landowners, and interested and affected parties to inform them in sufficient detail of what the prospecting or mining operation will entail on the land, in order for them to assess what impact the prospecting will have on them or on the use of their land.

Mawetse has appointed Digby Wells Environmental as the independent environmental consultant to compile the EMP for the prospecting right application and facilitate the PP process.

A description of the Consultation / PP process is provided in detail in Table 2 below.

Table 2: Public Participation Activities

Activity	Details	Reference in Report
Communication with Land Claims Department	On 03 December 2015, Digby Wells emailed and faxed a letter enquiring if there are any land claims residing over the farms mentioned in Table 1; feedback is pending.	**Appendix A** Land Claims Enquiry Letter.
Identification of stakeholders	A stakeholder database which includes I&APs from various sectors of society, including directly affected and adjacent landowners in and around the proposed project area, has been compiled.	**Appendix B** Stakeholder Database.
Distribution of proposed project announcement letter and Background Information Letter (BIL)	BIL with comment and registration sheet was emailed to stakeholders on ***Thursday, 03 December 2015***. The Background Information Letter was also made available on www.digbywells.com, on ***03 December 2015***.	**Appendix C** BIL, with registration and comment form, advert and site notices.
Placing of adverts	An English advert was placed in The Steelburger on ***Friday, 04 December 2015***.	**Appendix C** BIL, with registration and comment form, advert and site notices.
Placing of site notices	Three (3) English site notices were put up on ***Monday, 07 December 2015*** at the following public places: • Greater Tubatse Local Municipality offices; • Greater Tubatse Local Municipality Public Library; and • Limpopo Economic Development Agency	**Appendix C** BIL, with registration and comment form, advert and site notices.
Obtaining comments from stakeholders	I&APs were provided the opportunity to comment on the application and register by completing the registration and comment form. Comments received from consultations undertaken are included in Table 3. Consultation was undertaken with the following Traditional Authorities: • Tswako Mohlala Tribal Council, Sunday 6 December 2016 at 13:00, Lepeng Lodge; and • Ga-Maroga Tribal Council, Monday 7 December 2016 at 11:00, Ga-Maroga Village.	**Table 3**

Comments received from stakeholders to date are included in Table 3 as indicated below.

Table 3: Public Participation Activities

Contributor	Date	Comment Raised	Category
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be on dust?	Air Quality
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Investigations must be done on graves.	Heritage
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We have vacant and occupied land; an investigation is also needed to determine who some of this lands belong to.	Land Value / Use and Ownership
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Farming land needs to be taken into consideration.	Land Value / Use and Ownership
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be from noise?	Noise
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	What will the impact be on groundwater?	Water - Ground
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	It is a good proposal because it will help our communities, our people need jobs.	Socio-economic - Employment
Mr Solly Mphago Tswako Mohlala Tribal Council	06-Dec-15	Even at this stage communities will need to know, although it isn't a project yet, how many jobs will be created for the local people.	Socio-economic - Employment
Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	A project of this caliber is good for the community and our people need jobs, but things need to be done according to protocol.	Socio-economic - Employment
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We need to put in place a strategy on how to consult with the communities.	Public Participation
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Mawetse Mining and Digby Wells need to work together with communities from the beginning of the application.	Public Participation
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Communities need to be aware that this engagement is for the prospecting right application consultation phase.	Public Participation
Mr Selatole Moretsele Tswako Mohlala Tribal Council	06-Dec-15	There is a need of consultation with Induna's so they can help Digby Wells to be able to do their work within the community.	Public Participation
Mr Solly Mphago Tswako Mohlala Tribal Council	06-Dec-15	I believe consultation means you need to know the interests of the community you are consulting with -developments within the community.	Public Participation

Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	Ga-Maroga Tribal Authority and the Council need to consult with their Legal experts before they can commit themselves. Hence, the consultant is not allowed to record the meeting and members will not fill in an attendance register.	Public Participation
Kgoshi Maroga Ga-Maroga Tribal Council	07-Dec-15	There are certain structures that are vehicles of the community that need to be involved and they are not in the meeting, only the council.	Public Participation
Council Members Ga-Maroga Tribal Council	07-Dec-15	Timeframes for the consultation was too limited; we need another meeting whereby every structure in the community will be represented.	Public Participation
Mr Paul Maroga Ga-Maroga Tribal Council	07-Dec-15	A date need to be setup for a meeting with all our structures present.	Public Participation
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	We are not only concerned about jobs, but several specialists studies need to be done before starting with any development.	Environmental Impact Assessment
Mr Daniel Moretsele Tswako Mohlala Tribal Council	06-Dec-15	Communities will need to know what will be the process after DMR has given feedback on the Prospect Right Application.	Environmental Impact Assessment
Mr Matienyate Moeng Tswako Mohlala Tribal Council	06-Dec-15	Now that Mawetse Mining has background and knowledge of what they want to do in the area, the people working with Kgoshi need to deliver the news to the Induna's so they can go into their communities to deliver the information to avoid misleading information.	Need and Desirability for the Project
Council Members Ga-Maroga Tribal Council	07-Dec-15	We would like to have projects like this in our community as it creates jobs and that we appreciate that Mawetse Mining came to us in the past to discuss what they had in their mind in regards to what they wanted to do.	Need and Desirability for the Project
Kgoshi Mohlala Tswako Mohlala Tribal Council	06-Dec-15	Communities and Mawetse need to have a relationship in terms of business should all go well with the application.	General
Mr Mathias Komane Tswako Mohlala Tribal Council	06-Dec-15	In all processes to be done there is a protocol to be followed by all parties.	General

5.2 Provide a list of which of the identified communities, landowners, lawful occupiers, and other interested and affected parties were in fact consulted.

Refer to *Appendix B: Stakeholder Database* for a list of the I&APs.

5.3 Provide a list of their views raised in regard to the existing cultural, socio-economic or biophysical environment, as the case may be.

Refer to Table 3 for a complete list of stakeholder comments received to date.

5.4 Provide a list of their views raised on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.

Refer to Table 3 for a complete list of stakeholder comments received to date.

5.5 Provide a list of any other concerns raised by the aforementioned parties.

Refer to Table 3 for a complete list of stakeholder comments received to date.

5.6 Provide the applicable minutes and records of the consultations as appendices.

Refer to Table 3 for a complete list of stakeholder comments received to date.

5.7 Provide information with regard to any objections received.

No objections have been received to date.

6. Describe the most appropriate means to carry out the proposed operation with due accommodation of the issues raised in the consultation process.

The prospecting activities will take place by means of borehole drilling utilising drill rigs. The size of the areas where prospecting will take place will be limited to minimise the surface disturbance (10 x 10 m site) per site. Initially, it is proposed that four boreholes will be drilled in areas that will minimise disturbance to the communities and avoid impacting on water courses. In the course of subsequent phases of the prospecting programme, additional boreholes may be required

Due to farm houses existing on the Prospecting Area, no prospecting will take place within 100 m of any infrastructure. Communication and consultation with the landowners will be held prior to any drilling activities.

C. IDENTIFICATION OF THE REPORT

The report on the results of consultation must, at the end of the report include a certificate of identification as follows:

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act, as the case may be.	
Full Names and Surname	
Identity Number	

- END -

APPENDIX A: LAND CLAIMS

Project no: MMC3745 *03 December 2015*

Ms Gladys Mogale

Limpopo Department of Rural Development and Land Reform

Land Claims Commission

96 Kagiso House

Cnr Rissik and Schoeman Streets, Polokwane

Limpopo, 0700

MAWETSE (SA) MINING CORPORATION (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

DMR Reference number: LP2530PR

Dear Ms Mogale

Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) has applied for a Prospecting Right for Chrome Ore, Copper, Gemstone, Vanadium Ore, Andalusite and Magnetite in respect of the farms Mooihoek 255 KT and Driekop 253 KT, near Steelpoort. The Department of Mineral Resources (DMR) is the competent authority for the application which was submitted and duly accepted in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

The proposed project site falls within the Greater Tubatse Local Municipality, which is located in Sekhukhune District Municipality, Limpopo Province. The proposed Prospecting Right area is on farms Driekop 253 KT and Mooihoek 255 KT and is within Driekop, approximately 13km north west of Steelpoort, in the Limpopo Province.

It is the intention that prospecting activities will be undertaken over a period of two years and will be carried out in different phases, that is:

- Phase 1: desktop review, soil and rock sampling and geological interpretation; and
- Phase 2: laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

It is not envisaged that more than four boreholes will be drilled and none will be within 100m of a river or wetland. The precise location of the boreholes will be determined during Phase 1.

After completion of the prospecting activities, it is likely that an Application for a Mining Right will be submitted to the DMR and simultaneously an application for Environmental Authorisation will be made for the project.

Digby Wells Environmental has been appointed as the independent Environmental Assessment Practitioner and would like to enquire if there are any land claims on the farms, as outlined in the table below.

Farm Name	Portion	Local Municipality	District Municipality
Directly Affected Farms			
DRIEKOP 253 KT	253	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	RE/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	1	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	2/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	3/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	4/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	5/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	6/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	7/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MOOIHOEK 255 KT	8/255	Greater Tubatse Local Municipality	Sekhukhune District Municipality
Indirectly Affected Farms			
CLAPHAM 118 KT	RE/118	Greater Tubatse Local Municipality	Sekhukhune District Municipality
TWYFELAAR 119 KT	RE/119	Greater Tubatse Local Municipality	Sekhukhune District Municipality
WINNAARSHOEK 250 KT	250	Greater Tubatse Local Municipality	Sekhukhune District Municipality
DE KOM 252 KT	252	Greater Tubatse Local Municipality	Sekhukhune District Municipality
MAANDAGSHOEK 254 KT	254	Greater Tubatse Local Municipality	Sekhukhune District Municipality
GROOTHOEK 256 KT	RE/256	Greater Tubatse Local Municipality	Sekhukhune District Municipality
GROOTHOEK 256 KT	1/256	Greater Tubatse Local Municipality	Sekhukhune District Municipality
SCHLICKMANSKLOOF 258 KT	2/258	Greater Tubatse Local Municipality	Sekhukhune District Municipality
DERDE GELID 278 KT	RE/278	Greater Tubatse Local Municipality	Sekhukhune District Municipality
DERDE GELID 278 KT	2/278	Greater Tubatse Local Municipality	Sekhukhune District Municipality
DERDE GELID 278 KT	4/278	Greater Tubatse Local Municipality	Sekhukhune District Municipality
HENDRIKSPLAATS 281 KT	281	Greater Tubatse Local Municipality	Sekhukhune District Municipality
GARATOUW 282 KT	RE/282	Greater Tubatse Local Municipality	Sekhukhune District Municipality

Should you require additional information please do not hesitate to contact me.

Yours sincerely

Vanessa Viljoen

Stakeholder Engagement Office

Digby Wells Environmental

Tel: (011) 789 9495 or Fax: 086 583 5715

Email: vanessa.viljoen@digbywells.com

Postal Address: Private Bag X 10046, Randburg 2125

APPENDIX B: STAKEHOLDER DATABASE

MAWETSE (SA) MINING CORPORATION (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

STAKEHOLDER DATABASE

Department	Name	Surname
National/Provincial Government		
National Department of Environmental Affairs (DEA)	Millicent	Solomons
National Department of Environmental Affairs (DEA)	Pumeza	Skepe
National Department of Environmental Affairs (DEA)	Nyiko	Nkosi
National Department of Environmental Affairs (DEA)	Dorothy	Kgathi-thite
National Department of Environmental Affairs (DEA)	Obed	Baloyi
National Department of Environmental Affairs (DEA)	Mark	Gordon
National Department of Environmental Affairs (DEA)	Lucas	Mahlangu
Limpopo Department of Agriculture	Jacqueline	Maisela
Department of Agriculture , Forestry and Fisheries (DAFF)	Lydia	Bosoga
Department of Agriculture , Forestry and Fisheries (DAFF)	Mashudu	Marubini
Department of Agriculture , Forestry and Fisheries (DAFF)	Mpume	Ntlokwana
Limpopo Department of Water and Sanitation (DWS)	Ben	Sengani
Department of Water and Sanitation (DWS)	Kama	Meso
Department of Water and Sanitation (DWS)	Felicia	Nemathaga
Limpopo Department of Water and Sanitation (DWS)	Love	Hlekane
Limpopo Department of Water and Sanitation (DWS)	Malegodi	Mahlatji
Limpopo Department of Public Works	Thabo	Mphilo
Limpopo Department of Public Works	Ngoashenga	Nare
Department of Labour	Albert	Tshidavhu
Limpopo Department of Labour	Carol	Mthethwa
Limpopo Department of Mineral Resources (DMR)	Aaron	Kharivhe
Limpopo Department of Mineral Resources (DMR)	Mapula	Sathekge
Limpopo Department of Mineral Resources (DMR)	Thivhulwani	Kolani
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Tinyiko	Malungani
Limpopo Department of Economic Development, Environment and Tourism (LEDET)	Gladys	Mogale
Limpopo Department of Rural Development and Land Reform - Land Claims	SR	Mphasha
Limpopo Department of Rural Development and Land Reform - Land Claims	Senwana	Makhanana
Limpopo Heritage Resources Authority (LIHRA)	Donald	Lithole
Limpopo Department of Roads & Transport	Jonathan	Gafane

National Nuclear Regulator (NNR)	Patle	Mohajane
Local Government		
Greater Tubatse Local Municipality	R S	Mamekoa
Greater Tubatse Local Municipality	JNT	Mohlala
Greater Tubatse Local Municipality	M L	Mabilu
Greater Tubatse Local Municipality	M E	Mokgoga
Greater Tubatse Local Municipality	P C	Sekgobela
Greater Tubatse Local Municipality	N M	Moropane
Greater Tubatse Local Municipality	R S	Mamekoa
Greater Tubatse Local Municipality	M T	Lesinya
Greater Tubatse Local Municipality	MS	Hlongwa
Greater Tubatse Local Municipality	NC	Moropane
Greater Tubatse Local Municipality	AN	Magane
Greater Sekhukhune District Municipality	M S	Makoko
Greater Sekhukhune District Municipality	A	Matjiya
Greater Sekhukhune District Municipality	K	Robinson
Tribal Authorities		
Mohlala Tribal Authority - Driekop 255KT	Lesiba	Mohlala
Mohlala Tribal Authority - Driekop 255KT	Bethuel	Mohlala
Mohlala Tribal Authority - Driekop 255KT	Masiya	Mohlala
Mohlala Tribal Authority - Driekop 255KT	Daniel	Meretsele
Pulana Maroga Traditional Council - Mooihoek 255 KT	Kgoshi	Maroga
Pulana Maroga Traditional Council - Mooihoek 255 KT	Paul	Maroga
Pulana Maroga Traditional Council - Mooihoek 255 KT	William	Chego
Agriculture		
Agri SA - Lephalale	Francois	Van der Berg
Agri South Africa- Witbank Farmers Association	Gert	Smith
Northern Traansvaal Agricultural Union (NTLU)	Wilma	Prinsloo
Northern Transvaal Agricultural Union (NTLU)	J	Swanevelder
Transvaal Agricultural Union S.A (TLUSA)	Gert	Snyman
Directly Affected Landowners		
DRIEKOP 253 KT, Portions 253 - National Government of the Republic of South Africa/SA Ontwikkel Trust/ Bapedi Ba Tswako Mohlala	Bethuel	Mohlala
MOOIHOEK 255 KT ,Portion RE/255 - No Information on Windeed	Thabo	Mphelo
MOOIHOEK 255 KT ,Portion 1 - National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 2 - National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 3 – National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 4 - National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 5 - National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 6 - National Government of the Republic of South Africa	Thabo	Mphelo
MOOIHOEK 255 KT, Portion 7 - National Government of the Republic of South Africa	Thabo	Mphelo

MOOIHOEK 255 KT, Portion 8 - National Government of the Republic of South Africa	Thabo	Mphelo
Indirectly Affected Landowners		
SOUTH AFRICAN DEVELOPMENT TRUST CLAPHAM 118 KT, Portion RE/118	Thabo	Mphelo
NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA Twyfelaar 119 kt,Portion RE/119	Thabo	Mphelo
GOVERNMENT OF LEBOWA/ Bapedi Tribe Winnaarshoek 250 KT,Portion 250	Thabo	Mphelo
NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA De Kom 252 KT,Portion 252	Thabo	Mphelo
REPUBLIC OF SOUTH AFRICA/ SA ONTWIKELINGSTRUST Maandagshoek 254 KT, Portion 254	Thabo	Mphelo
NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA Groothoek 256 KT, Portion RE/256	Thabo	Mphelo
Groothoek 256 KT, Portion 1 /256 - NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA	Thabo	Mphelo
NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA Schlickmanskloof 258 KT, Portion 2/258	Thabo	Mphelo
GOVERNMENT OF LEBOWA Derge Gelid 278 KT,Portion RE/278	Thabo	Mphelo
Derge Gelid 278 KT,Portion 2/278 - NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA	Thabo	Mphelo
Derge Gelid 278 KT,Portion 4/278 – NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA	Thabo	Mphelo
MODIKWA PLATINUM MINE PTY LTD Hendriksplaats 281 KT, Portion 281	James	Ndou
RUSTENBURG PHARMACEUTICAL SUPPLIERS PTY LTD - 281 KT, Portion 281	Thabo	Mphelo
NATIONAL GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA Garatouw 282 KT,Portion RE/282	Thabo	Mphilo
Industry/Commerce/Business		
Transnet	Phillip	De Klerk
South African National Civic Organisation (SANCO) - Limpopo	MJ	Maphoso
Eskom Park (Eskom Holdings)	Xander	Neethling
Eskom Holdings	Josiah	Zungu
Environmental NGOs		
Birdlife South Africa	Mark	Anderson
Birdlife South Africa	Pamela	Barrett
Birdlife South Africa	Daniel	Marnewick
Center for Environmental Rights NPC	Nathan	Philander
Earthlife Africa	Makoma	Lekalaka
Earthlife Africa	Dominique	Doyle
Endangered Wildlife Trust (EWT)	Bradley	Gibbons
Endangered Wildlife Trust (EWT)	Wendy	Collinson

Lowveld Bird Club	Karen	Bullen

APPENDIX C: PUBLIC PARTICIPATION DOCUMENTS

Project No: MMC3745 03 December 2015

MAWETSE (SA) MINING CORPORATION (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

DMR Reference number: LP2530PR

Dear Stakeholder,

Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) has applied for a Prospecting Right for Chrome Ore, Copper, Gemstone, Vanadium Ore, Andalusite and Magnetite in respect of the farms Mooihoek 255 KT and Driekop 253 KT, which is being processed by the Department of Mineral Resources (DMR), as the competent authority. This was done in terms of Section 16 and 39 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA).

1 PROJECT DESCRIPTION

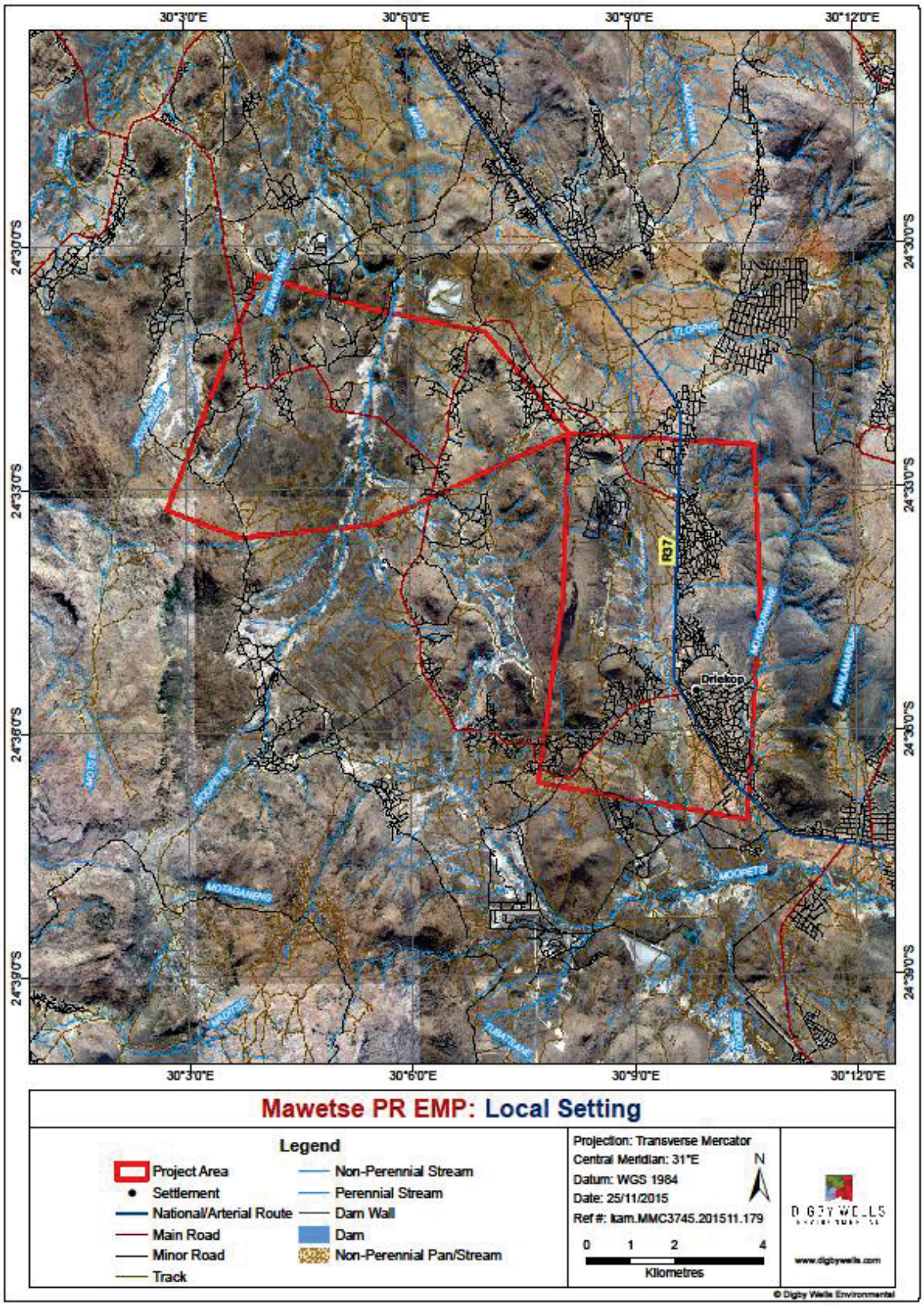
It is the intention that prospecting activities will be undertaken over a period of two years and will be carried out in the following phases:

- Phase 1: desktop review, soil and rock sampling and geological interpretation; and
- Phase 2: laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

It is not envisaged that more than four boreholes will be drilled and none will be within 100m of a river or wetland. The precise location of the boreholes will be determined during Phase 1. After the completion of the prospecting activities, it is likely that an Application for a Mining Right will be submitted to the DMR and simultaneously an application for Environmental Authorisation will be made for the project. The proposed project site falls within the Greater Tubatse Local Municipality, which is located in Sekhukhune District Municipality, Limpopo Province. The proposed prospecting right area is on farms Driekop 253 KT and Mooihoek 255 KT and is within Driekop, approximately 13km north west of Steelpoort, Limpopo Province (see Plan 1).

2 Environmental Impact Assessment

In terms of the MPRDA a Public Consultation Report and Environmental Management Plan (EMP) will be completed and submitted to the DMR. These documents will be made available to the public for comment and Interested and Affected Parties (I&APs) will be informed of availability. Digby Wells Environmental (Digby Wells) has been appointed by Mawetse as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) process. The following specialist studies will be undertaken: Heritage Assessment Fauna and Flora Assessment; Surface Water Assessment; Wetland Assessment; Social Assessment; Soil; Land Use and Land Capability Assessment; Closure and Rehabilitation Assessments.



Plan 1: Local Setting of the Project

3 Public Participation Process

A Public Participation Process (PPP) has been initiated as a requirement for this project with the purpose of sharing project information and gathering comments from stakeholders. Below are important milestones.

- **Project announcement**: This Background Information Letter (BIL), with registration and comment sheet, has been provided to announce the project and to provide background.
- **Comment on the EMP**: The EMP will be available for public comment after submission to the Department of Mineral Resources (DMR) in January 2016 on the Digby Wells website.

The EMP will include the Comment and Response Report (CRR) and the Public Consultation Report, and I&APs will simultaneously be informed of the EMP availability for comment on the Digby Wells website.

3.1 How to comment on the BIL

Stakeholders are invited to provide comments on the BIL by addressing comments, concerns or suggestions to Digby Wells by any one of the following:

- Completing the registration and comment form and submitting it to the Stakeholder Engagement Office;
- Writing a letter;
- Sending an email or fax; or
- Telephone call to the Stakeholder Engagement Office.

Should you wish to be registered as an I&AP, obtain additional information or comment on the proposed Prospecting Right application, please contact Vanessa Viljoen at Tel: (011) 789 9495, Fax: 086 583 5715, Post: Private Bag X10046, Randburg, 2125 or email: vanessa.viljoen@digbywells.com.

Regards,

Vanessa Viljoen

Stakeholder Engagement Office

Enclosed

- Registration and Comment Form

DIGBY WELLS
ENVIRONMENTAL

MAWETSE (SA) MINING CORPORATION (PTY) LTD
PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

DMR Reference number: LP2530PR

REGISTRATION AND COMMENT FORM

December 2015

Registered Interested and Affected Parties (I&APs) will be informed of ongoing developments via their preferred means of communication (SMS, email, post or fax). The Environmental Management Plan will be available for public comment in January 2016 on www.digbywells.com (under Public Documents) and I&APs will be informed of its availability timeously. Please register as an I&AP and provide comments by sending this form, or other written correspondence, to the contact details provided below:

Vanessa Viljoen or **Qondile Monareng** of Digby Wells Environmental Stakeholder Engagement Office:
Fax: 0865835715, **Telephone:** (011) 789 9495, **Postal Address:** Private Bag X10046, Randburg, 2125
Email: vanessa.viljoen@digbywells.com or qondile.monareng@digbywells.com

Please formally register me as an Interested and Affected Party (I&AP)	Yes		No	
I would like to receive my notifications by	Email	SMS	Post	Fax

Please indicate which sector you represent and also provide a name

Government Department	
Municipality	
Community	
Non-Government Organisation	
Business	

If you are a *landowner* or *land occupier*, please indicate which farm(s) and portion(s) you reside on

Landowner	
Land occupier	

Please fill in your contact details below for the project database

Title, Full Name					
Designation					
Cellphone		Fax		Tel	
Email					
Postal Address					

Environmental Impact Assessment Regulations of 2014, promulgated in terms of the National Environmental Management Act, as amended, Section 44 (1) requires that we *gather comments* from I&APs. Please complete the questions below. Should you require assistance in completing these questions please contact the Stakeholder Engagement Office contact information provided above.

How do you think the project might impact (affect) you?
How do you think the project might impact (affect) your socio-economic conditions? (e.g. livelihoods, farm, business, household)
How can these impacts be managed, avoided and / or fixed?

If you are a landowner or occupier, what is your land currently being use for?

Are there any environmental, social or heritage features on the proposed project area we need to be aware of?

Where are these found?

Do you think the project could impact (affect) infrastructure you might have? (e.g. houses, buildings, roads)

If so how can these impacts (affects) be managed, avoided or fixed?

General Comments

If there are any other stakeholders we should include onto the stakeholder database for the proposed project, please provide their contact details.

Title, Full Name		Title, Full Name	
Organisation		Organisation	
Cellphone		Cellphone	
Email		Email	

Signature ***Date***

DIGBY WELLS
ENVIRONMENTAL

MAWETSE (SA) MINING CORPORATION (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

DMR Reference number: LP2530PR

Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) has applied for a Prospecting Right for Chrome Ore, Copper, Gemstone, Vanadium Ore, Andalusite and Magnetite in respect of the farms Mooihoek 255 KT and Driekop 253 KT, near Steelpoort. The Department of Mineral Resources (DMR) is the competent authority for the application which was submitted and duly accepted in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

Project Location

The proposed project site falls within the Greater Tubatse Local Municipality, which is located in Sekhukhune District Municipality, Limpopo Province. The proposed Prospecting Right area is on farms Driekop 253 KT and Mooihoek 255 KT and is within Driekop, approximately 13km north west of Steelpoort, in the Limpopo Province.

Project Description

It is the intention that prospecting activities will be undertaken over a period of two years and will be carried out in different phases, that is:

- Phase 1: desktop review, soil and rock sampling and geological interpretation; and
- Phase 2: laboratory analysis, percussion borehole drilling, geophysical survey and the preparation of a geological model.

It is not envisaged that more than four boreholes will be drilled and none will be within 100m of a river or wetland. The precise location of the boreholes will be determined during Phase 1. After completion of the prospecting activities, it is likely that an Application for a Mining Right will be submitted to the DMR and simultaneously an application for Environmental Authorisation will be made for the project.

Stakeholders affected by, or who are interested in, the proposed project are invited to register as an Interested and Affected Party (I&AP) by contacting us on Tel: 011 789 9495, Fax: 086 583 5715, Postal: Private Bag X10046, Randburg, 2125, Email: gondile.monareng@digbywells.com.

Project Code: MMC3745 December 2015

Elize Troskie and Marietta Pruis.

Mariëtta Herbst, Carmen Broodryk and Elmine Malan.

Patrons enjoy the glamour of a hot night in Morocco

Lydenburg residents got the opportunity to experience another night in Morocco when Café Crust hosted this outstanding themed event on Friday. The venue was decorated with brightly coloured fabrics and Moroccan antiques while guests were entertained by belly dancers and music related to the theme. Various delicious dishes were on the menu.

Rinska Harmse, Nico Mulder, Marietjie Marais and PC Harmse.

Padstal's market day is a first

Bridget Mpande

LYDENBURG - Vermont Padstal held its first market day on Saturday, November 28. The day catered for the whole family and various stalls were available. The DJ kept the crowd entertained while they enjoy delicious prawns, sausages and cold beverages from the bar.

According to Chrystelle Diedericks from Vermont Padstal, the public can look forward to another family day early next year.

"This was our first one and before winter next year, we will host another. We appreciate the support we received from the public and to everyone that had a stall, thank you for sharing in the day with us."

Vermont Padstal is about 30 kilometres out on the Lydenburg/Dullstroom road and is open from 09:00 till 19:00 Monday to Sunday. Facilities include a bar, eatery and a shop where a wide range of items is sold.

Riaan Viljoen, La Rochelle Diedericks, Wera Viljoen and Chrystelle Diedericks.

Leané Diedericks, Rina Diedericks and Montenique Snyman.

Cobus Blignaut and André Moolman.

Elaine Blignaut and Frans Mahlangu sold prawns to the guests.

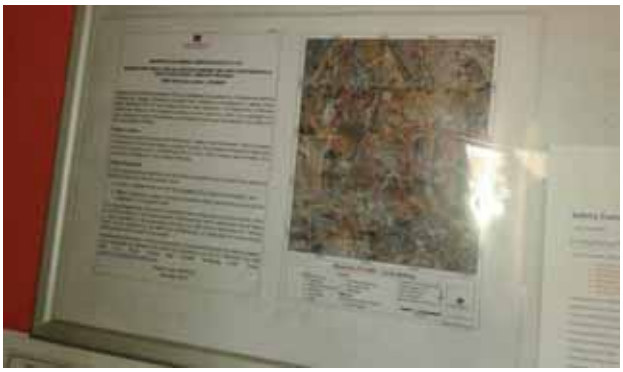
MAWETSE (SA) MINING CORPORATION (PTY) LTD

PROSPECTING RIGHT APPLICATION FOR CHROME ORE AND OTHER MINERALS NEAR STEELPOORT, LIMPOPO PROVINCE

SITE NOTICES

SITE NOTICES PLACED AT PUBLIC PLACES ON 07 December 2015

Public Place	Coordinates / Location	Photo
Greater Tubatse Local Municipality	S 23.68066 E 027.47275	
Greater Tubatse Local Municipality Public Library	S 24.67055 E 030.033026	

Limpopo Development Agency Offices	S 24.67758 E 030.3004	

Plan 2

Mawtse PR EMP

Site Notice Locations

Legend

- Site Notice Locations
- Project Area
- City
- Other Town
- Settlement
- Main Road
- National Road
- River
- Dam

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.025
Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 08/12/2015

0 5 10 20
Kilometres
1:4,000

www.digbywells.com

Appendix C: Heritage Report

DIGBY WELLS
ENVIRONMENTAL

SAHRIS Case ID: 8971

Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province

Heritage Basic Assessment Report

Project Number:

MMC3745

Prepared for:

Mawetse (SA) Mining Corporation (Pty) Ltd

December 2015

Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48 Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Basic Assessment Report**
Project Name:	**Basic Assessment Report: Environmental Management Plan in support of the Prospecting Rights Application for Mooihoek 255KT and Driekop 253KT, near Steelpoort, Limpopo Province**
Project Code:	**MMC3745**

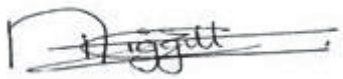
Name	Responsibility	Signature	Date
Natasha Higgitt Assistant Heritage Resources Management Consultant ASAPA Member No.335	Overall Report Compiler and site visit		December 2015
Justin du Piesanie Heritage Resources Management Consultant: Archaeology Specialist ASAPA Member No 270	1st Review		December 2015
Johan Nel Heritage Resources Management: Unit Manager ASAPA Member No 095	Final Reviewer		December 2015

Digby Wells and Associates (Pty) Ltd

Contact person: Natasha Higgitt

Turnberry Office Park	Tel:	011 789 9495
48 Grosvenor Road	Fax:	011 789 9498
Bryanston	E-mail:	natasha.higgitt@digbywells.com
2191		

I, Natasha Higgitt 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 Mawetse (SA) Mining Corporation (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Heritage Resources Management (HRM) Process for the proposed Mooihoek and Driekop Prospecting Right Application Project, Limpopo Province.



_____

Full name:	Natasha Higgitt
Title/ Position:	Assistant Heritage Management Consultant: Archaeologist
Qualification(s):	BA Honours in Archaeology
Experience (years):	5 years' experience
Registration:	Association of Southern African Professional Archaeologists (ASAPA)
	South African Museums Association (SAMA)

EXECUTIVE SUMMARY

Digby Wells Environmental (Digby Wells) has been appointed by Rustenburg Platinum Mines (Pty) Ltd (RPM) to compile an Environmental Management Plan (EMP) in support of a Prospecting Right Application (PRA). The PRA is for the farms Mooihoek 255KT and Driekop 253KT north of Steelpoort, in the Sekhukhuneland Magisterial District, Limpopo Province.

The EMP and PRA will be completed in terms of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014, with reference to listed activity 20 of GN R.983.

This report constitutes a Heritage Basic Assessment Report (HBAR) to inform the overall Basic Assessment Report (BAR).

The PRA is for the prospecting of Platinum Group Metals (PGM) and associated minerals. Prospecting activities will include invasive and non-invasive methods. Non-invasive methods will include a ground magnetic survey and a non-intrusive survey that will not have an impact on the receiving environment. Invasive methods will include diamond core drilling to ascertain the stratigraphy sequence and the reef horizons of the ore body. It is anticipated that a maximum of four boreholes will be drilled over a five year period.

The following Scope of Work (SoW) has been completed:

- Brief literature review based on existing impact assessment reports in the surrounding area and available databases; and
- Historical layering to identify potential structures older than 60 years and changes in the cultural landscape;
- Pre-disturbance survey of the proposed study area to record the current state of the cultural landscape;
- Developing cultural significance of identified heritage resources;
- Impact Assessment and possible sources of risk; and
- Recommend mitigation measures.

Geologically, the study area is underlain by the Bushveld complex. The study area lies within the Western Limb of the Rustenburg Layered Suite that is a mafic formation (magma flows), which does not contain any sedimentary layers and therefore no fossils

Archaeologically, Early (EFC) and Late Farming Community (LFC), historical sites and burial grounds have been recorded within the regional and site specific study area, though none of these sites have been identified within 100 m of the proposed prospecting boreholes.

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Mooihoek and Driekop PRA. No significant heritage resources were identified within 100 m of the proposed prospecting boreholes during the desktop study.

Heritage resources were identified at a local level including Stone Age surface occurrences, an EFC site and a grave, though none were identified near the borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey.

Potential risks to heritage resources include accidental damage or destruction to identified and un-identified heritage resources during site clearance for temporary road/route construction, prospecting sites and rehabilitation purposes.

Based on the findings of this report, Digby Wells recommends the following mitigation and management plans:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- No prospecting activities can occur within 100 m of identified heritage resources;
- Chance Finds Procedures must be developed and implemented part of the EMP that clearly describe the process and appropriate management of the exposure of previously unidentified heritage resources; and
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA).

LIST OF ACRONYMS, ABBREVIATIONS AND TERMS

Abbreviation	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
Bsc	Bachelor of Science
Digby Wells	Digby Wells Environmental
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Early Stone Age
ESTA	Extension of Security of Tenure Act (Act No. 62 of 1997)
GIS	Geographical Information System
GPS	Global Positioning System
HBAR	Heritage Basic Assessment Report
HIA	Heritage Impact Assessment
Hons	Honours degree
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
LSA	Late Stone Age
LIHRA	Limpopo Provincial Heritage Resources Authority
MA	Master of Arts
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
MSc	Master of Science
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMA	South African Museum Association
SoW	Scope of Work
Ste	Structure
UNESCO	United Nations Education, Scientific and Cultural Organisation
UP	University of Pretoria
Wits	University of the Witwatersrand

GLOSSARY

Term	Definition
Archaeologist	A trained professional who uses scientific methods to excavate record and study archaeological sites and deposits.
Artefact	Any object manufactured or modified by human beings.
Burial Grounds and Graves Consultation (BGGC)	The regulated consultation process required in terms of Section 36 of the NHRA and Regulations IX and XXI to the Act when burial grounds and graves are identified within a project area.
Ceramic (syn. pottery)	In an archaeological context any vessel or other object produced from natural clay that has been fired. Indigenous ceramics associated with Farming Communities are low-fired wares, typically found as potsherds. Imported and more historic ceramics generally include high-fired wares such as porcelain, stoneware, etc.
Cultural significance (CS)	The aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. A heritage may have cultural significance or other special value because of its: ■ Importance in the community, or pattern of South Africa's history. Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage ■ Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage. Importance in demonstrating the principal characteristic of a particular class of South Africa's natural or cultural places or objects. ■ Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group. ■ Importance in demonstrating a high degree of creative or technical achievement at a particular period. ■ Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. ■ Strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa. ■ Significance relating to the history of slavery in South Africa.
Development	Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including: ■ Construction, alteration, demolition, removal or change of use of a place or a structure at a place ■ Carrying out any works on or over or under a place. ■ Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place. ■ Constructing or putting up for display signs or hoardings. ■ Any change to the natural or existing condition or topography of land.

	■ Any removal or destruction of trees, or removal of vegetation or topsoil.
Early Farming Community/ies	The first Farming Communities (also known as Early Iron Age) that appear in the souther archaeological record during the early first millenium CE. The EFC period is generally dated from c. 200 CE to 1000 CE.
Farming Community/ies	Term signifying the appearance in the southern African archaeological of Bantu-speaking agricultural based societies from the early first millenium CE. The term replaces the *Iron Age* as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking. The Farming Community period is divided into an Early and Late phase. The use of Later Farming Communities especially removes the artifical boundary between archaeology and history.
Field Rating	SAHRA requires heritage resources to be provisionally rated in accordance with Section 7 of the NHRA that provides a three tier grading system of resources that form part of the national estate. The rating system distinguishes between four categories: ■ Grade I: Heritage resources with qualities so exceptional that they are of special national significance. ■ Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region. ■ Grade III: Other heritage resources worthy of conservation. ■ General Protected: i.e. generally protected in terms of Sections 33 to 37 of the NHRA.
Formal protection	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.
General protection	General protections are afforded to: ■ Objects protected in terms of laws of foreign states. ■ Structures older than 60 years. ■ Archaeological and palaeontological sites and material and meteorites. ■ Burial grounds and graves. ■ Public monuments and memorials.
Grave	A place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
Heritage Impact Assessment (HIA)	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are clearly outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.
Heritage resource	Any place or object of cultural significance.

Heritage resources management	■ Process required when development is intended categorised as: Any linear development exceeding 300m in length. ■ Construction of a bridge or similar structure exceeding 50 m in length. ■ Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority. ■ Re-zoning of a site exceeding one hectare in extent. ■ Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Heritage site	Any place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.
Late Farming Community/ies	Farming Communities who either developed / evolved from EFC groups, or who migrated into southern African from the late first millenium / early second millenium CE. The LFC period evidences distinct changes in socio-political organisation, settlement patterns, trade and econmic 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.
Middle Stone Age	The South African MSA dates from ~300 Kya to c. 30 Kya. This period is associated with the changing behavioural patterns and the emergence of modern cognitive abilities in early *Homo sapiens species*. The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.
National estate	■ The national estate as defined in Section 3 of the NHRA, i.e. heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include: Places, buildings, structures and equipment of cultural significance. ■ Places to which oral traditions are attached or which are associated with living heritage. ■ Historical settlements and townscapes. ■ Landscapes and natural features of cultural significance. ■ Geological sites of scientific or cultural importance. ■ Archaeological and palaeontological sites. ■ Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003. ■ Sites of significance relating to the history of slavery in South Africa. ■ Movable objects, including objects recovered from the soil or waters of

	South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest. ■ Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
Palaeontological	Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance.
Pre-disturbance survey (syn. reconnaissance)	A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.
Provisional protection	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.

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1 Introduction

Digby Wells Environmental (Digby Wells) has been appointed by Mawetse (SA) Mining Corporation (Pty) Ltd (Mawetse) to compile an Environmental Management Plan (EMP) in support of a Prospecting Right Application (PRA). The PRA is for the farms Mooihoek 255KT and Driekop 253KT, north of Steelpoort in the Sekhukhuneland Magisterial District, Limpopo Province.

The EMP and PRA will be completed in terms of the National Environmental Management Act, 1999 (Act No. 107 of 1999) (NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 with reference to listed activity 20 of GN R. 983.

Digby Wells was appointed to undertake the necessary environmental and social studies required for the EMP and PRA. This report constitutes a Heritage Basic Assessment Report (HBAR) to inform the overall Basic Assessment Report (BAR).

1.1 Project Background

Mawetse intends to conduct prospecting activities on the properties discussed above. Digby Wells will be compiling an EMP for the PRA for Listed Activities in terms of the legal framework presented in section 2.6 below. A Basic Assessment (BA) process will be undertaken in support of the EMP.

1.2 Project description and activities

Prospecting activities will include invasive and non-invasive methods. Non-invasive methods include a ground magnetic survey and a non-intrusive survey that will not have an impact on the receiving environment. The ground magnetic survey will aid in the identification of areas to be drilled to obtain the required data for the mapping of the ore body. Datasets supplied by the Council of Geoscience will be used along with and remote sensing methods such as satellite and aerial imagery to define the extent of the ore body. Airborne geophysical surveys and field reconnaissance of the area will be also be undertaken to aid in the determination of the potential extent of the ore body.

1.2.1 Construction Phase (Site clearing)

No construction will take place as no permanent infrastructure will be established. Activities will be limited to possible temporary access roads, as well as the clearing of vegetation for the construction of the prospecting drill site. Three sumps will be constructed to separate and store oil, sludge and water. The prospecting sites will be an area approximately 10 m x 10 m. Cleared topsoil will be stockpiled on site to a maximum height of 1 m.

1.2.2 Operational Phase (Drilling)

Invasive methods will include diamond core drilling to ascertain the stratigraphic sequence and the reef horizons of the ore body. It is anticipated that a maximum of four boreholes will be drilled over a five year period.

No permanent infrastructure will be constructed as part of the prospecting activities.

1.2.3 Decommissioning Phase (Rehabilitation)

The sumps, access roads/tracks and prospecting sites will be rehabilitated following the prospecting activities.

The rehabilitation activities will include the following:

- Rehabilitation of each prospecting drill site concurrently with the prospecting work schedule. As the drill rig is removed from the site, rehabilitation will commence; and
- Where necessary, the site will be ripped where the soil has become compressed and compacted.

1.2.4 Project Activities

The Project will trigger EIA Regulations, 2014 Listed Activities listed in Table 1-1 below.

Table 1-1: Listed activities

Activity No.	Activity	GN R Activity	NHRA Trigger
Establishment and Operational Phase			
1	Any activity which requires a prospecting right in terms of the MPRDA including earthworks directly related to the prospecting of a mineral resource	GN R983 Listing Notice 1 Activity 20	Section 38 (8)

Based on the project activities, only Activity 20 of Listing Notice 1 is triggered, however the above project activities will be considered during the impact assessment.

1.2.5 Project location

The site specific project area is located 12.5 km north from the town of Steelpoort. Location details for the Project area summarised in Table 1-2 below.

Table 1-2: Location of the proposed expansion area

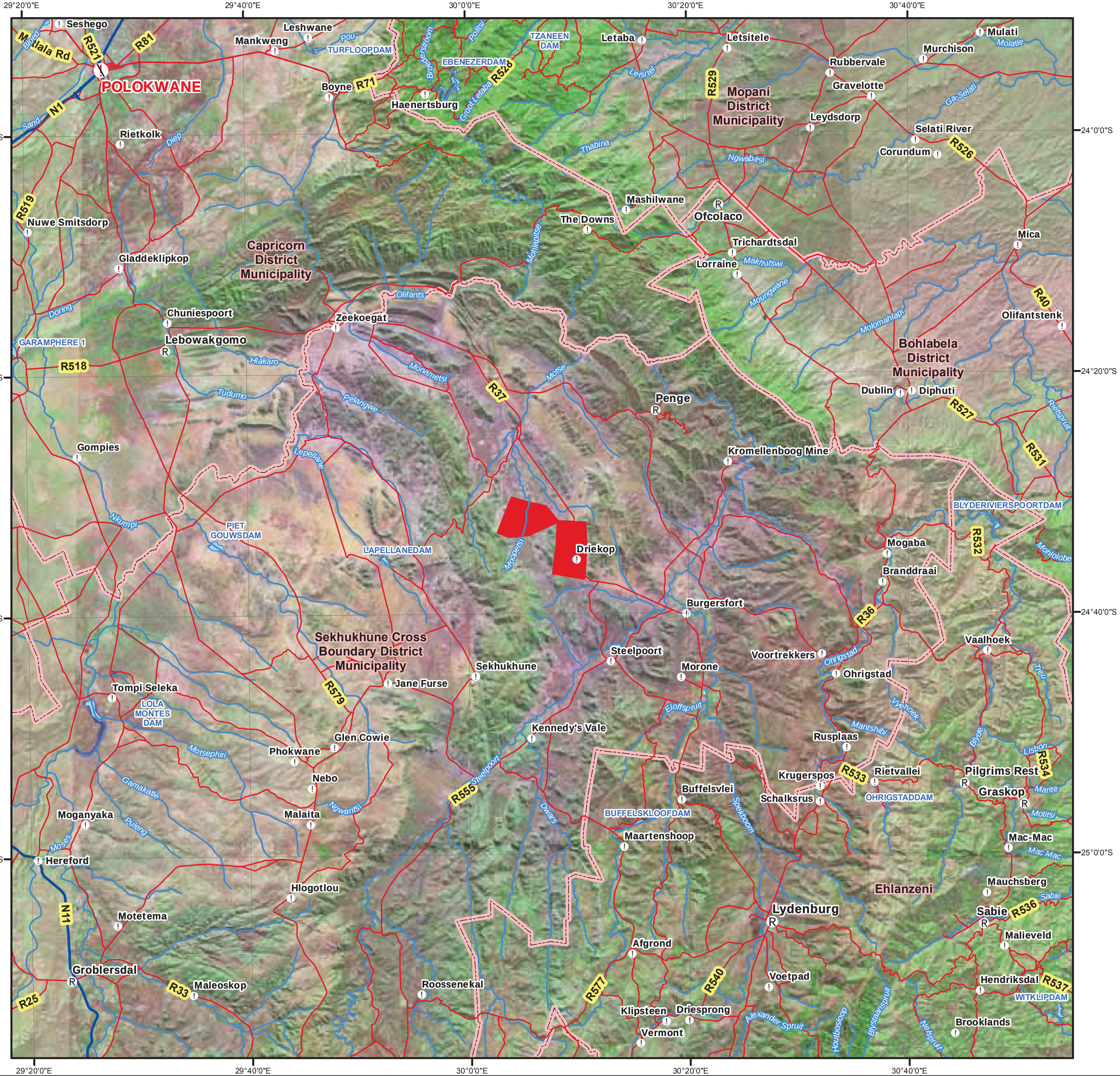
Province	Limpopo Province
Magisterial District / Local Authority	Sekhukhuneland Magisterial District
District Municipality	Greater Sekhukhune District Municipality
Local Municipality	Greater Tubatse Local Municipality
Nearest Town	Steelpoort
Property Name and Number	Mooihoek 255KT Driekop 253KT

1: 50 000 Map Sheet	2430 CA Steelpoort
GPS Co-ordinates (relative centre point of study area)	-24.539354
	30.135823

The location of the proposed prospecting boreholes is summarised in Table 1-3 below

Table 1-3: Proposed prospecting borehole locations

Borehole	Latitude	Longitude
001	-24.571005	30.154687
002	-24.584149	30.137168
003	-24.514698	30.071267
004	-24.539213	30.096119



Plan 1

Mawetse PR EMP

Regional Setting

Legend

- Project Area
- City
- Secondary Town
- Other Town
- Settlement
- Main Road
- National Road
- River
- Dam
- District Municipality

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Datum: WGS 1984
Central Meridian: 31°E

Ref #: kam.MMC3745.201512.050
Revision Number: 1
Date: 14/12/2015

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Kilometres
1:600,000

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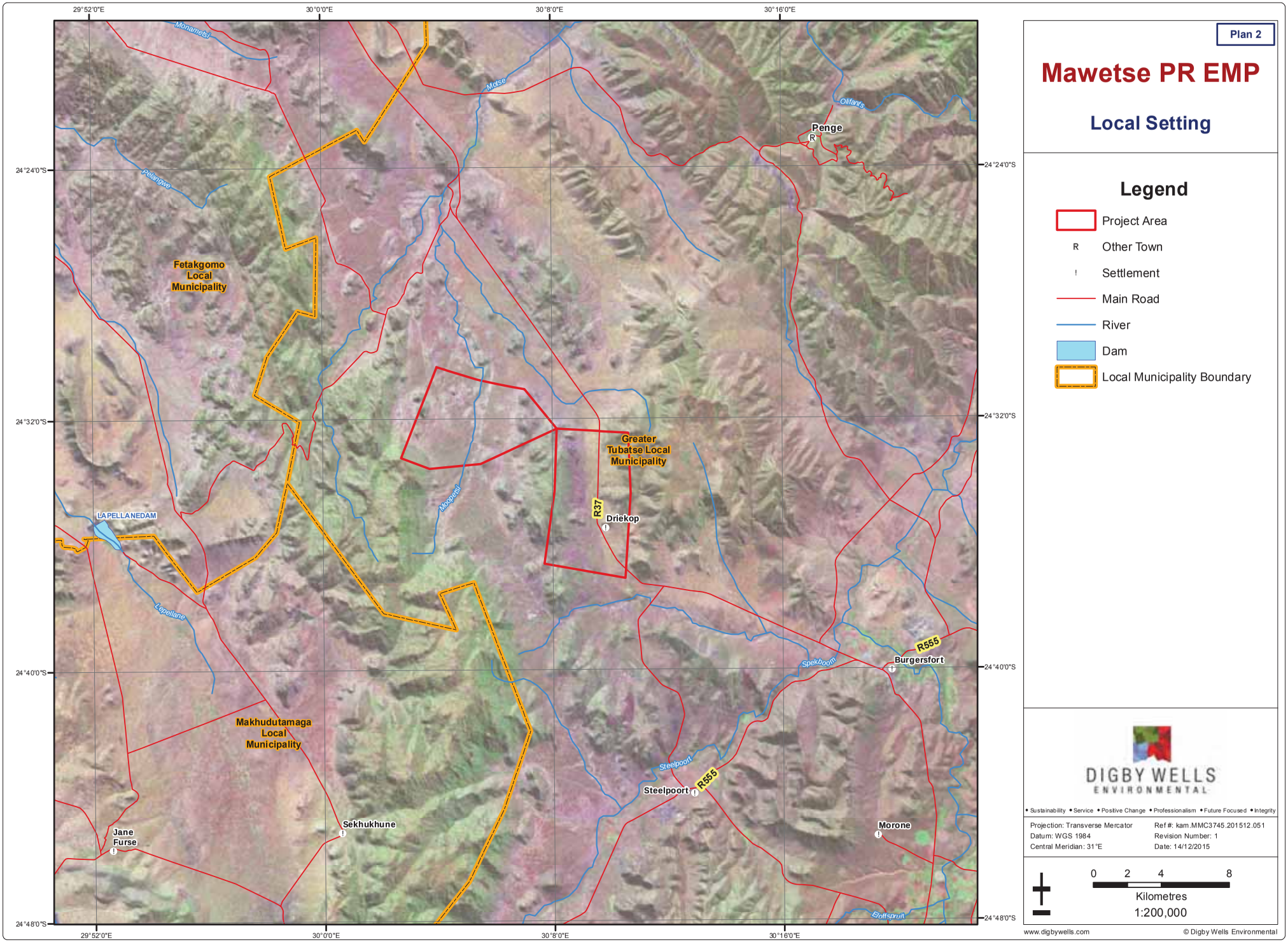

Plan 2

Mawetse PR EMP

Local Setting

Legend

- Project Area
- R Other Town
- ! Settlement
- Main Road
- River
- Dam
- Local Municipality Boundary

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Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 14/12/2015

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Kilometres
1:200,000

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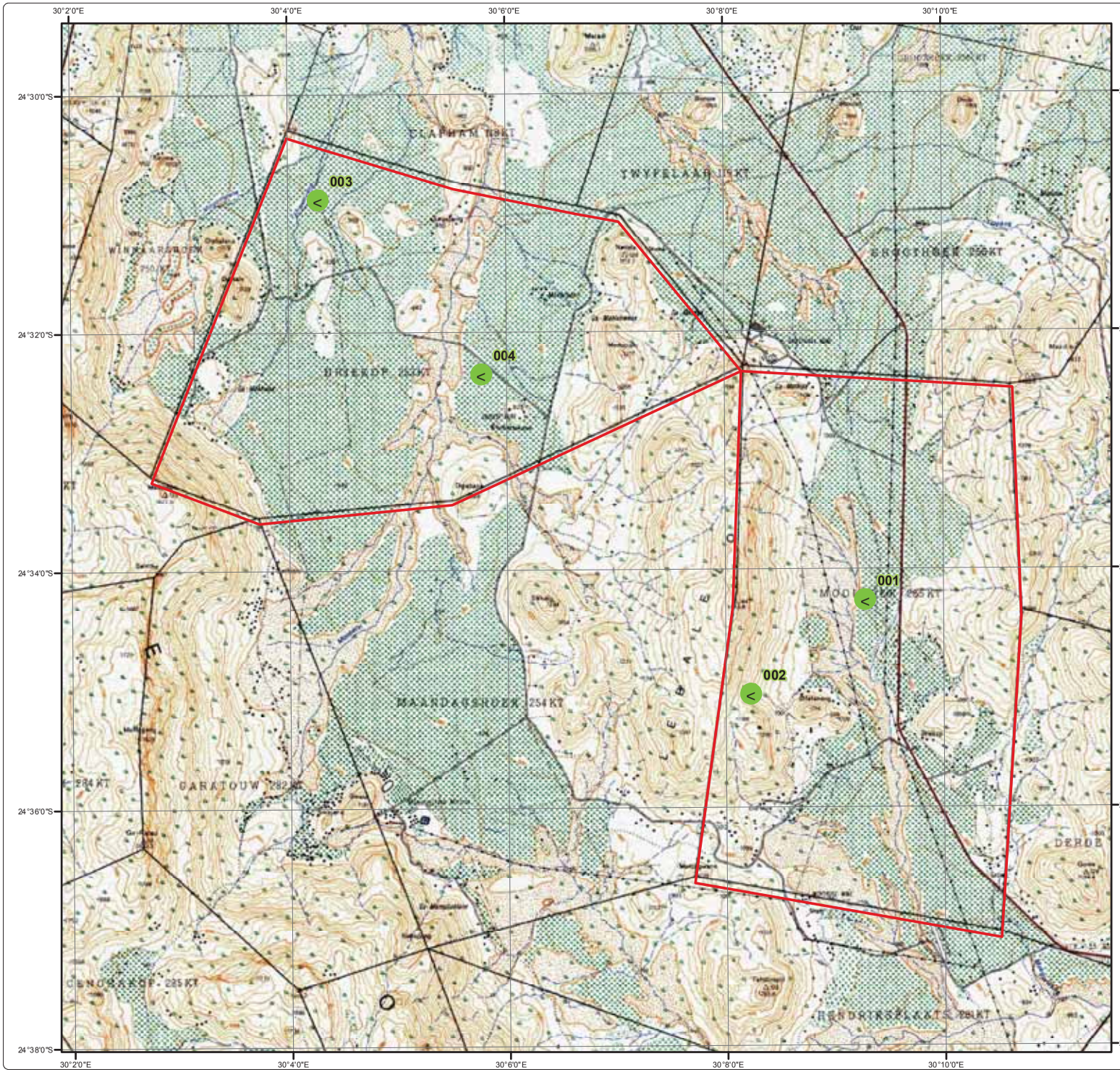
Plan 3

Mawetse PR EMP

Site Specific Setting



Legend

- Project Area
- Proposed Prospecting Boreholes

2430AC Moroka
2430CA Steelpoort

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Projection: Transverse Mercator	Ref #: kam.MMC3745.201512.052
Datum: WGS 1984	Revision Number: 1
Central Meridian: 31°E	Date: 14/12/2015

0 0.5 1 2 3
Kilometres
1:60,000

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1.3 Scope of Work

The Terms of Reference (ToR) issued to Digby Wells required that a BA process be completed for the EMP and PRA. This BA process needed to include a Heritage Resources Management (HRM) process. The HRM process comprised a Notification of Intent to Develop (NID) and a HBAR for submission to the South African Heritage Resources Agency (SAHRA) and Limpopo Provincial Heritage Resources Agency (LIHRA).

1.4 Purpose and contents of report

The purpose of this HRM process, including the NID and HBAR is to:

- Timeously furnish responsible heritage resources authorities (HRAs) with the project information;
- Provide HRAs with details regarding the location, nature and extent of the proposed activities;
- Identify the specific heritage sensitivities in the study area, including acceptable levels of change in relation to assigned cultural significance;
- Provide specialist recommendations for appropriate and feasible mitigation measures; and
- Ensure compliance with applicable legislation referred to in Chapter 3 below.

This report is structured as follows:

- Chapter 1 summarises the project description and project activities;
- Chapter 2 describes the methodology undertaken during the HRM process and the compilation of this report;
- Chapter 3 provides a brief outline of the legal framework applicable to the HRM process;
- Chapter 4 provides a description of the cultural heritage baseline and affected environment;
- Chapter 5 discusses the impact assessment undertaken; and
- Chapter 6 provides a summary of the most salient points of the heritage assessment and recommendations for appropriate mitigation measures where required.

2 Methodology

The following activities were completed during the HRM process:

- Defining study areas;
- Data collection;

- Developing cultural significance of identified heritage resources; and
- Completing an impact assessment.

2.1 Defining Study Areas

Three 'concentric' study areas were defined for the purposes of this study. These areas are defined below; each one encompasses its precursor and exceeds it in scale:

- The ***regional study area*** - this area was defined as the Greater Sekhukhune District Municipality (GSDM). 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 as shown in Plan 1.
- The ***local study area*** – the area most likely to be influenced by any changes to heritage resources in the study area, or where project development could cause heritage impacts. This area was defined as the immediate surrounding properties / farms, as well as the affected Greater Tubatse Local Municipality (GTLM) (See Plan 2).
- The ***site-specific study area*** – this is the area where heritage impacts are most probable due to development. This area is defined as the extent of the farm portions, of the proposed study area including any buffer areas around the study area that may be required. (See Plan 3).

The relevance of defining study area arises from the fact that heritage resources do not exist in isolation to the greater natural and social (including socio-cultural, -economic and -political) environment. There is also a legal requirement to provide suggested field ratings for identified heritage resources (see Section 2.3 below). These field ratings aim to assist responsible heritage resources authorities in grading resources into three categories in terms of national (Grade I), provincial (Grade II) and local (Grade III) 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.

2.2 Data Collection

Data collection is necessary to develop a cultural heritage baseline profile, discussed in Section 4. Gathered information assisted in the development of the cultural heritage baseline profile, determination of cultural significance, and assessment of impacts. Qualitative and quantitative data were collected for the HBAR.

2.2.1 Legal review

Relevant national legislation were reviewed and summarised in section 2.6. The purpose was to ensure that the Mooihoek and Driekop EMP and PRA process adhered to all conditions contained in these documents.

2.2.2 Literature review and desktop data collection

Relevant information was sourced from available reports, publications, websites and cartographic sources, listed in section 8.

Table 2-1: Summary of reviewed information sources

Relevant Previous Heritage Studies		
Author	**Report Type**	**Area/development**
Birkholtz & Steyn, 2005	HIA	Dwarsrivier 372KT and Thorncliffe 374KT
Fourie, 2008	AIA	Mooihoek 255KT
Huffman & Schoeman, 2000	AIA	Lebalelo Pipeline
Hutten, 2008	HIA	Groothoek Residential and Industrial Development
Roodt, 2003a	HIA	Der Brochen Tailings Dams
Van Schalkwyk, 2001	AIA	Sekhukhuneland
du Piesanie, 2012	HIA	Sylvania

Historical layering was completed for the site specific area and aimed to identify historical heritage resources. 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 three fold as follows:

- Provides relative dates based on the presence/absence of visible features;
- To identify changes in the cultural landscape; and
- Identifies potential locations where heritage resources may exist within an area.

Cartographic sources referred to in this report are listed in Table 2-2 below.

Table 2-2: Relevant reviewed cartographic sources

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
131	007	74967 - 74970	2330 2331 2430	Tzaneen/Ohrigstad	1938	131/1938
	008	74988 - 74990				
	012	75066 - 75067				
	017	75155 - 75160				
325	027	07508 - 07512	2330 2331 2430 2431 2530 2531	Pilgrim's Rest/Sabie/Leydsdorp	1954	325/1954
	028	07610				
	029	07635				

2.2.3 Pre-disturbance survey

The pre-disturbance survey was undertaken by Natasha Higgitt, a qualified and accredited archaeologist on 9 December 2015. The site specific project area was surveyed through pedestrian methods using an unstructured and unsystematic approach. Each proposed prospecting boreholes was inspected for heritage resources. A 100 m^2 buffer zone was surveyed around each borehole. One of the boreholes (002) could not be surveyed as the only access road had been washed away by recent heavy rains.

The survey was recorded as a GPS track logs and the landscape was documented through photographic and written records.

2.2.4 Site naming

Site identified in previous relevant studies are prefixed by the SAHRIS case or map number and the original site name used by the author, i.e**. 2529DD/HH06**

2.3 Developing cultural significance and field ratings

2.3.1 Cultural significance

Determining the CS of heritage resources, and assign field ratings to these, are legal requirements as described in section 2.6 below.

CS was determined based on identified resources' importance or contribution to four broad value categories: aesthetic, historical, scientific and social values. The resources'

importance or contributions to these values were considered in terms of associative (qualitative) and / or rarity (quantitative) attributes. These attributes were based on the data collected and collated into the cultural heritage baseline profile described in Section 4 below.

Qualitative data was used to identify any associative attributes such as notable people or groups, important events, or significant aspects that may be associated with the resource.

Quantitative data was used to determine the rarity of any attributes based on other similar examples that may exist elsewhere.

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.

A detailed methodology statement is provided in Appendix B.

2.3.2 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. Each category requires specific minimum required mitigation measures and consequent management responsibilities. Field ratings are closely linked to the importance rating, described in Section 0 below. The field rating process therefore aimed to facilitate the decision-making process.

A detailed methodology statement is provided in Appendix B.

2.4 Impact assessment

Impacts to heritage resources can be broadly divided into three categories – direct, indirect and cumulative. The assessments of these impacts are done by assigning a numerical value to the significance of the identified impacts.

The assessment of impacts inherently considers the CS and field ratings. The consequence of the potential impact was weighted against the parameters intensity, spatial scale and duration. To identify the significance of the impact, the con sequence was measured against the probability of the impact occurring.

The magnitude of the potential impact was applied to both pre- and post-mitigation scenarios with the aim of removing all negative impacts on heritage resources, and enhancing positive ones.

A detailed methodology statement is provided in Appendix B.

2.5 Constraints and Limitations

The following constraints and limitation were associated with the project:

- Detailed development footprints and borehole positions were not available at the time of the pre-disturbance survey and compilation of this report. The proposed prospecting locations were plotted by the Digby Wells GIS unit for approval from

Mawetse. Should the proposed prospecting locations be amended, this will result in a gap in the results of the heritage pre-disturbance survey;

- Access to one of the borehole locations (002) was not possible at the time of the survey;
- In view of its locality and potential heritage impact, one of the proposed boreholes (002) may need to be re-sited during the course of the geological surveys. Since no on-site work will take place during this phase, the consulting geologist will be able to re-assess the location prior to the commencement of operations. After the new location has been finalised, the point will be inspected by a qualified archaeologist who will make further recommendations if necessary;
- Many tangible heritage resources, specifically archaeological resources, commonly occur below the surface, and may not be identified, documented and assessed without intrusive and destructive methods. Intrusive archaeological assessments require permits issued in terms of section 35 of the NHRA. However, these are not issued as part of so-called Phase impact assessments. Therefore, the findings in the reviewed literature, and especially existing HIA reports, are in themselves limited to surface observations.

2.6 Consultant and Specialists[1]

Natasha Higgitt compiled the overall DHBAR. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She held the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 5 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*).

Justin du Piesanie undertook the first technical review of this DHBAR. 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. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 9 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. 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

[1] Detailed curricula vitae of the specialists are attached as Appendix A

compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

Johan Nel undertook the second technical review of this DHBAR. He has more than 15 years of combined experience in the field of HRM including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. He has gained experience both within urban settings and remote rural landscapes. Since 2010 he has been actively involved in environmental management that has allowed Johan to investigate and implement the integration of heritage resources management into EIA's. Many of the projects since have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. This exposure has allowed Johan to develop and implement a HRM approach that is founded on international best practice, leading international conservation bodies such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and ICOMOS and aligned to the South African legislation. Johan has worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone.

Johan is a professional member of ASAPA (*Member No. 095*), accredited CRM practitioner, and a member of ICOMOS South Africa (*Member No. 13839*).

3 Legal and policy framework

This section outlines the general legal and policy framework within which the proposed EMP and PRA is being undertaken. This includes national and provincial legislation, local legislation and policy as well as international best practice standards.

3.1 Minerals and Petroleum Resources Development Act, Act No. 28 of 2002 (MPRDA)

The MPRDA is the overarching legislation that regulates all mining activities in the Republic of South Africa. Section 5(4) states that no person may mine or commence with any work incidental thereto on any area without an approved EMP. An EMP does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application. However, an EMP and PRA do require a BAR or EIA to be conducted.

The EIA or BAR must therefore be conducted in accordance with section 38 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.

3.2 National Environmental Management Act, Act No. 107 of 1998 (as amended) (NEMA)

This Act requires that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions so as to ensure that development serves present and future generations. The Act further sets out the process for public participation in terms of the 2014 NEMA Regulations

A BAR must be completed when a development triggers any activity in Listing Notice 1 of the EIA Regulations, 2014. Chapter 4 Section 19 states that where a basic assessment must be applied for, the BAR consider impacts and risks associated with the proposed project, it must include specialist reports (i.e. heritage and cultural aspects and impacts must be considered) and an EMP.

3.3 NEMA Regulations 2014

The NEMA Regulations provide a list of activities that would trigger the NEMA and what needs to be completed in the event of such activities i.e. the completion of a BAR or a full EIA process.

Listing Notice 1 Activity 20 deals with the operation of any activity that requires a prospecting rights in terms of section 16 of the Mineral and Petroleum Development Act (Act No. 28 of 2002) (MPRDA). Activities summarised in Listing Notice 1 requires a BAR to be completed as stated in section 3.2 above.

3.4 National Heritage Resources Act, Act No. 25 of 1999 (NHRA)

The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa. This Act considers various heritage resources as forming part of the national estate, contemplated in Section 3. In addition, certain other categories are afforded automatic formal or general protection. Sections considered relevant to this project are outlined below:

- Formal protection:
  - National and provincial heritage sites, Section 27;
  - Certain types of protected areas, Section 28; and
  - Heritage areas, Section 32.
- General protection:
  - Certain structures with demonstrable cultural significance or that are older than 60 years, Section 34;
  - Archaeological and palaeontological resources, Section 35;
  - Burial grounds and graves, Section 36; and

- All public monuments and memorials, Section 37.

Section 5 of the NHRA encapsulates general principles for HRM that this specialist heritage component of the Project aims to adhere to. Section 38 outlines the HRM process and minimum requirements that need to be complied with namely:

- Subsection (8) requires a HIA study to be conducted if an impact assessment is required in terms of any other Act such as the NEMA and MPRDA; and
- Subsection (3) outlines the minimum information that must be included in a HIA report.

This HBAR was completed to comply in part with sections 38 of the Act and will be submitted to the SAHRA and LIHRA for statutory comment.

3.5 SAHRA Mining and Prospecting Guidelines

SAHRA published prerequisites for mining and prospecting projects with regards to heritage resources in 2006 (SAHRA APMHOB Permit Committee, 2006) All superficial mining projects are likely to impact in one way or another on archaeological sites. Impact assessments are required before any disturbance of the landscape. In order to do this, a specialist report is required to allow the relevant authority to assess whether this approval can be granted. As such, no mining, prospecting or development can take place without prior heritage assessment and approval.

4 Cultural Heritage Baseline Description

The cultural baseline is based on information sources from previous HIAs conducted in the area and databases described in section 2.2.2 above. The baseline considered all study areas as discussed in section 2.1 above. The natural environment, geology, paleontological potential, Stone Age, Farming Communities and historical periods were investigated and are discussed below.

The cultural landscape of the regional and local study area can be categorised by the occurrence of Middle Stone Age (MSA) accumulations, Early (EFC) and Later Farming Communities (LFC), and historical settlements.

4.1 Regional and Local Study Area

4.1.1 Geology and Palaeontological Sensitivity

The geology underlying the regional and local study areas is that of the Bushveld Complex (Refer to Plan 4). The Bushveld Complex comprises the largest preserved mafic layered intrusions in the world. It consists of felsic and mafic igneous rocks, containing the world's

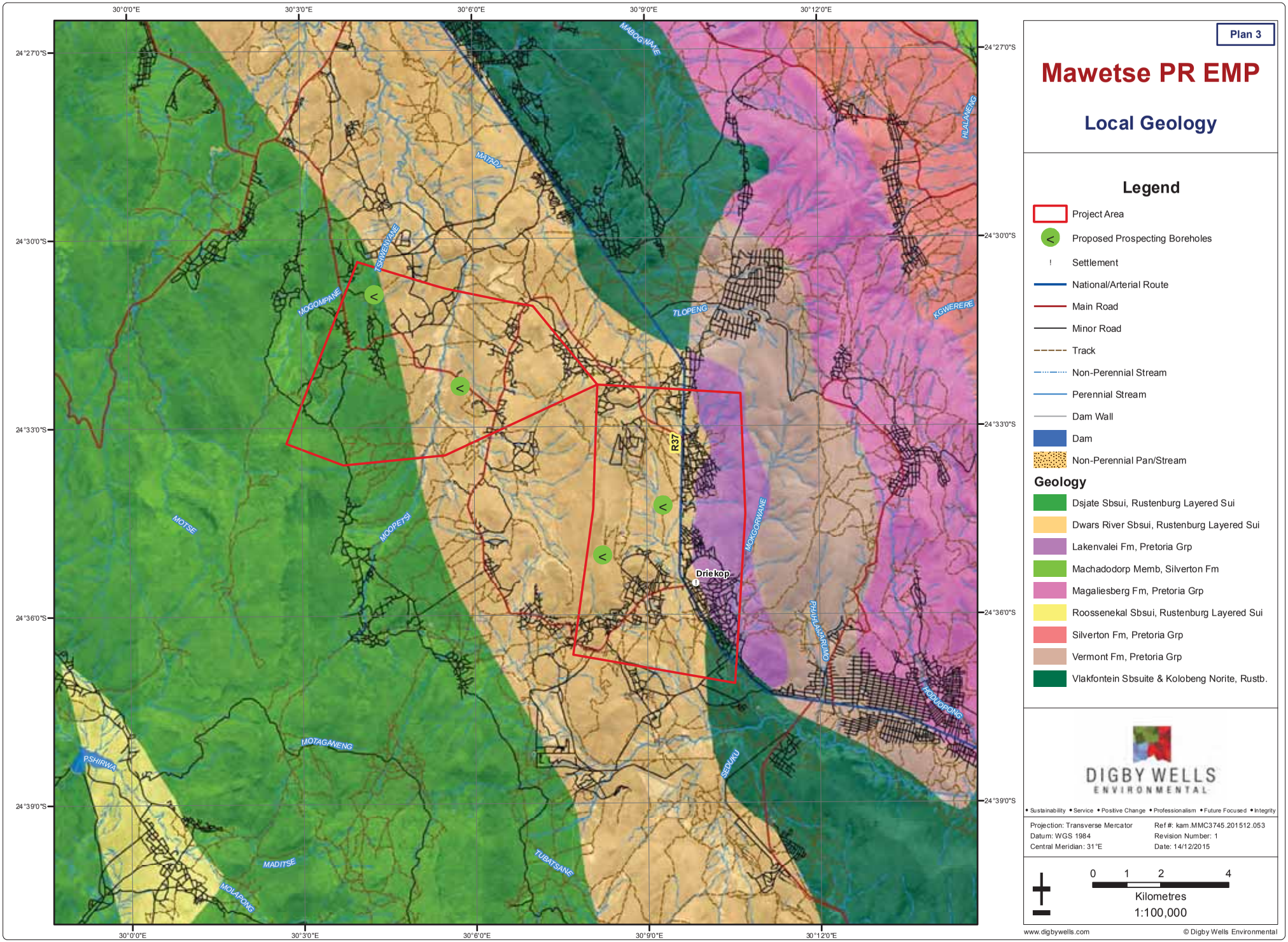
largest platinum-group elements ore reserves (Johnson, et al., 2006). The lithostratigraphy of the Bushveld Complex specific to the project area is summarised in Table 4-1 below.

The project area lies within the eastern limb of the Rustenburg Layered Suite that date from c. 2 500 Ma to around 2 000 Ma of the Eoproterozioc Era. The predominant rocks that comprise the Rustenburg Layered Suite include gabbro and gabbronorite – both igneous in origin and hence usually devoid of fossils (Cawthorn, et al., 2006, pp. 263-264; SAHRA, 2013c).

Table 4-1: Lithographic units and fossil sensitivity (adapted from Johnson et al 2006 and SAHRIS[2])

Ma	Eon	Era		Lithostratigraphic units			Lithology	Sensitivity	Fossils
2000-2050	Proterozoic	Eoproterozoic	Vaalian	Bushveld Complex	Rustenburg Layered (Vdr)	Critical Zone	Winterveld Norite-Anorthosite	Zero	None
2500							Mooihoek Pyroexnite	Zero	None
							Undertermined Quaternary	Zero	None

[2] http://www.sahra.org.za/sahris/fossil-heritage-layer-browser accessed 23/04/2015



Plan 3

Mawetse PR EMP

Local Geology

Legend

- Project Area
- Proposed Prospecting Boreholes
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream

Geology

- Dsjate Sbsui, Rustenburg Layered Sui
- Dwars River Sbsui, Rustenburg Layered Sui
- Lakenvalei Fm, Pretoria Grp
- Machadodorp Memb, Silverton Fm
- Magaliesberg Fm, Pretoria Grp
- Roossenekal Sbsui, Rustenburg Layered Sui
- Silverton Fm, Pretoria Grp
- Vermont Fm, Pretoria Grp
- Vlakfontein Sbsuite & Kolobeng Norite, Rustb.

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4.1.2 Stone Age

The Stone Age is represented by the presence of Early Stone Age (ESA), MSA and Later Stone Age (LSA) sites throughout the Mpumalanga-Limpopo 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).

A surface occurrence of MSA tools was identified 32 km north-west from the site specific project area (2429BD25). The MSA tools included flakes and core identified within an eroded area (Van Schalkwyk, 2001). Several surface occurrences of MSA tools were recorded in an eroded area 38 km south of the project area (Birkholtz & Steyn, 2005).

4.1.3 Early Farming Communities

The Farming Community period marks the arrival of Bantu-speakers who brought with them agriculture and metal working skills. Archaeologically, common identifiers of this period in the regional study area include ceramics and stone walled settlements (associated with the Late Farming Communities).

Stone walled settlements identified in the regional study area are classified as *Badfontein* type walling. *Badfontein* walling sites have been dated to as early as 1550 AD (Huffman, 2007). The sites are associated with the group known as the Koni. The origins of the group are unclear, however they settled in and around Lydenburg and Middleburg around the 15th and 16th centuries (Huffman, 2007). Metal working sites with metal slag and tuyere pipe fragments have also been identified within 46.5 km of the site specific study project area (Roodt, 2003a).

Communal activity areas are also common in the local study area. These consist of several grinding hollows and areas usually grouped or in a line as shown by Figure 4-1 below. Several were recorded 45 km south of the site specific study area (du Piesanie, 2012).

Figure 4-1: Example of communal activity area (du Piesanie, 2012)

Rock engravings in the Highveld region are predominantly associated with the Nguni speakers, such as the well-known Boomplaats site near Lydenburg approximately 50 km south-east of the project area. These engravings are thought to represent stone walled settlements within the area and can be found on large boulders located on the slopes of hills (Maggs, 1995; Smith & Zubieta, 2007).

4.1.4 Later Farming Communities and Historical Period

The LFC period and historical period overlap in this part of the country as the area saw the movements of many different groups, including white settlers. The historical period is commonly associated with contact between white Europeans with Bantu-speaking groups, and consequent *written* records[3].

The epicentre of the Pedi group (descendants of the Sotho-Tswana language groups) was located to the north of Lydenburg. The Pedi and the Boers soon established the Steelpoort River as a border between themselves in 1857. The Pedi leader Sekwati died in 1861 and his grave is located 4.7 km from the proposed PRA area (2430CA4). His successor, Sekhukhune, initially honoured the agreed upon border, however, he became uneasy with the arrival of the Berlin Missionaries. From 1867, the Pedi under Sekhukhune began to raid Boer homesteads and settlements. The Boers declared war on 16 May 1876 and built forts around the towns of Lydenburg and Middleburg. The Pedi, however, were starving due to the amount of time spent on raids, rather than farming. Sekhukhune eventually gave in and paid a fine of 2 000 head of cattle to the Transvaal Republic. When the Transvaal was

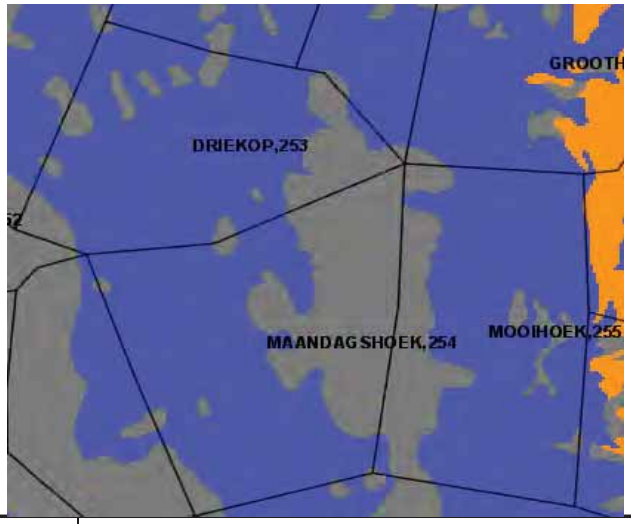
[3] The author acknowledges that in southern Africa the last 500 years represents a formative period that is marked by enormous internal economic invention and political experimentation that shaped the cultural contours and categories of modern identities outside of European contact. This period is currently not well documented and is being explored through the 500 year initiative (Swanepoel, et al., 2008)

annexed by the British, he was taxed by the British. When Sekhukhune announced that he was planning on becoming the paramount chief of all the tribes in the Lydenburg district in 1878, the British marched on him but were forced to turn back due to an outbreak of horse sickness. The Boer forts were re-occupied by the British which served to keep the Pedi within their borders. In 1879, Sekhukhune was attacked and captured. His settlement was destroyed and he was sent to prison in December 1879. He was eventually released but was murdered by a rival chief in 1883 (Smith, 1969).

4.2 Site Specific Study Area

4.2.1 Geology and Palaeontological Potential of the Study Area

According to the SAHRIS PalaeoSensitivity Map, the site specific area is located in an area of very low palaeontological sensitivity as depicted in Figure 4-2 below (SAHRIS, 2014). As stated in section 4.1.1 above, the Bushveld Complex is a predominantly igneous formation, and is devoid of fossils.



Sensitivity	Required action
Very High	Field assessment and chance finds protocol required
High	Desktop study to determine necessity of field assessment
Moderate	Desktop study
Low	No palaeontological studies necessary, but chance finds protocols are required
Insignificant/zero	No palaeontological studies necessary or chance finds protocols are required
Unknown	At minimum, a desktop study

Figure 4-2: Palaeontological sensitivity of the site specific study area

4.2.2 Stone Age

The literature review did not identify any Stone Age resources within the site specific area and these heritage resources are not discussed further in this section.

4.2.3 Farming Community

An Early Farming Community (EFC) site was uncovered during earthworks for the Lebalelo Pipeline (2430CA5) (Huffman & Schoeman, 2011). The site consisted of seven storage pits containing ash, pottery and cattle dung. The occupational layers were identified approximately 30 cm below the surface. There were no surface indicators of the site, and therefore was not recorded during the Archaeological Impact Assessment (AIA) conducted for the pipeline. This site is located within the site specific study area and 520 m from the closest proposed prospecting borehole (See Plan 5).

4.2.4 Historical period

Several stone structures were identified on the farm of Grootehoek, located immediately north of the farm of Mooihoek (Hutten, 2008). According to consultations with the local chief, the sites were confirmed to be temporary structures built by the people from Motlolo village as they were first settling into the valley in the late 1950's. Several grinding stones were found within the structures; however, no other artefacts could be identified within the sites.

According to a previous AIA conducted on Mooihoek 255KT, one grave (MHC001) is present within the proposed PRA area (Fourie, 2008) and 1.3 km from the closest proposed prospecting borehole (See Plan 5). The AIA does not provide a date for the grave; however, it is defined as a historic grave.

Historical aerial imagery shows how the project area has been altered since 1938. In 1938, much of the farm of Mooihoek was dominated by informal agricultural activities (See Figure 4-3). There are signs of residential dwellings; however, these are spaced far apart and not clustered into villages. There are small clusters of residential dwellings around the foot of the small koppies that scatter the farm of Driekop, with very little agricultural activities (See Figure 4-4).

By 1954, the R37 Provincial road had been built that transects the project area. The agricultural activities on Mooihoek have increased; with minimal residential dwellings present (See Figure 4-6). The amount of residential dwellings and agricultural activities had increased on Driekop between 1938 and 1954 as shown in Figure 4-5. This is consistent with the movement of the Motlolo people into the area in the 1950s.

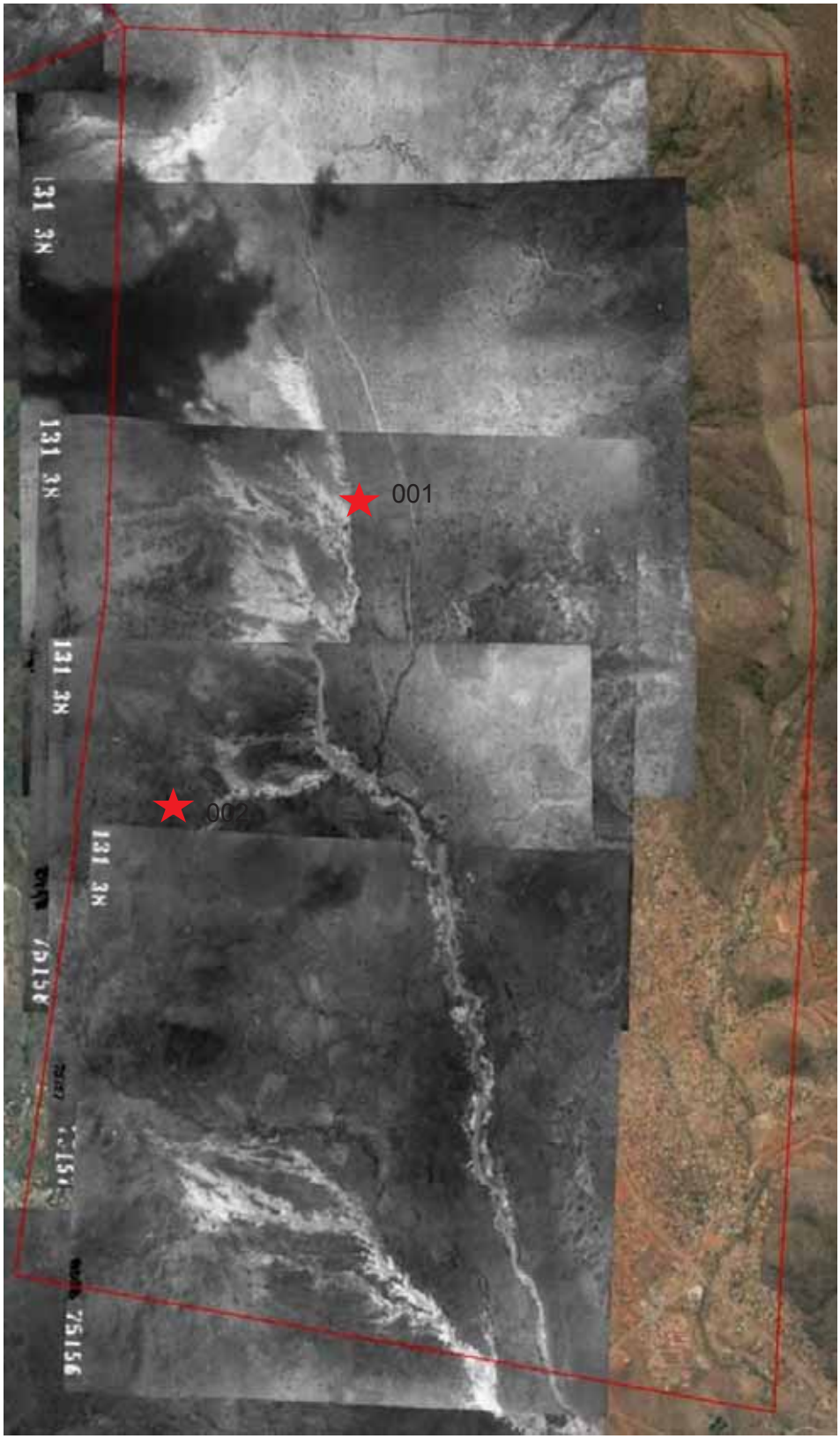


Figure 4-3: 1938 aerial imagery of Mooihoek 255KT showing the location of the proposed prospecting boreholes

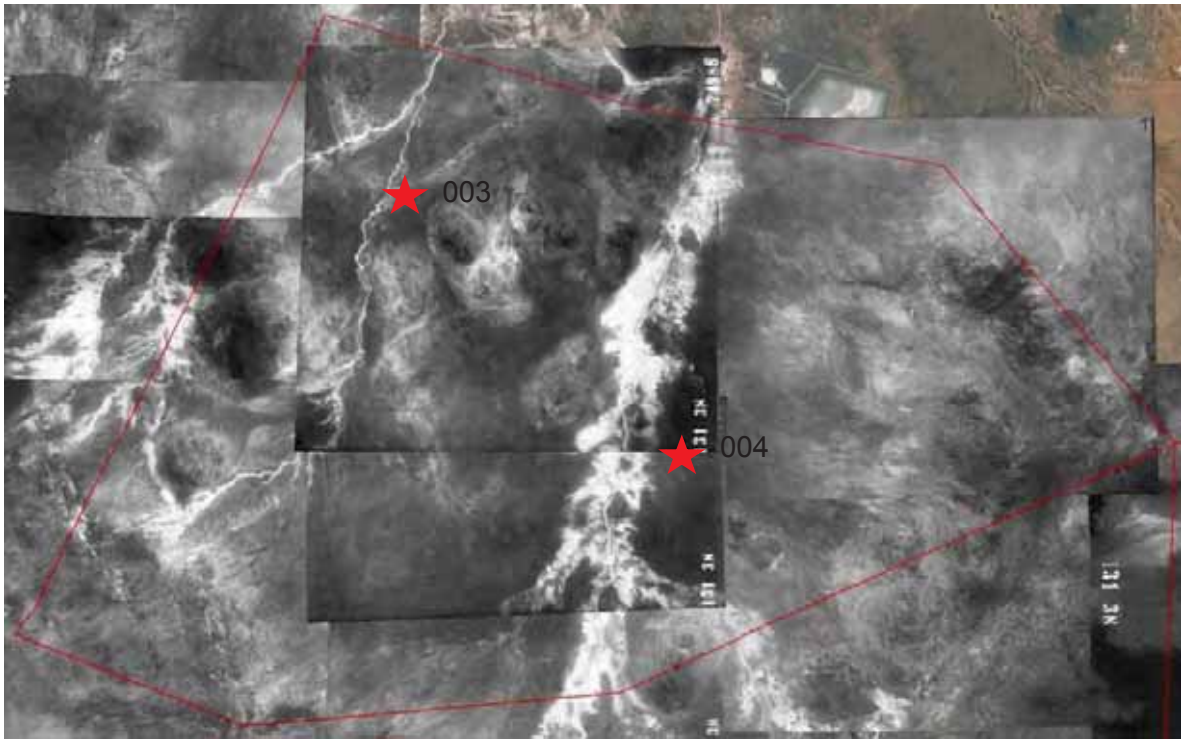


Figure 4-4: 1938 aerial imagery of Driekop 253KT showing the location of the proposed prospecting boreholes

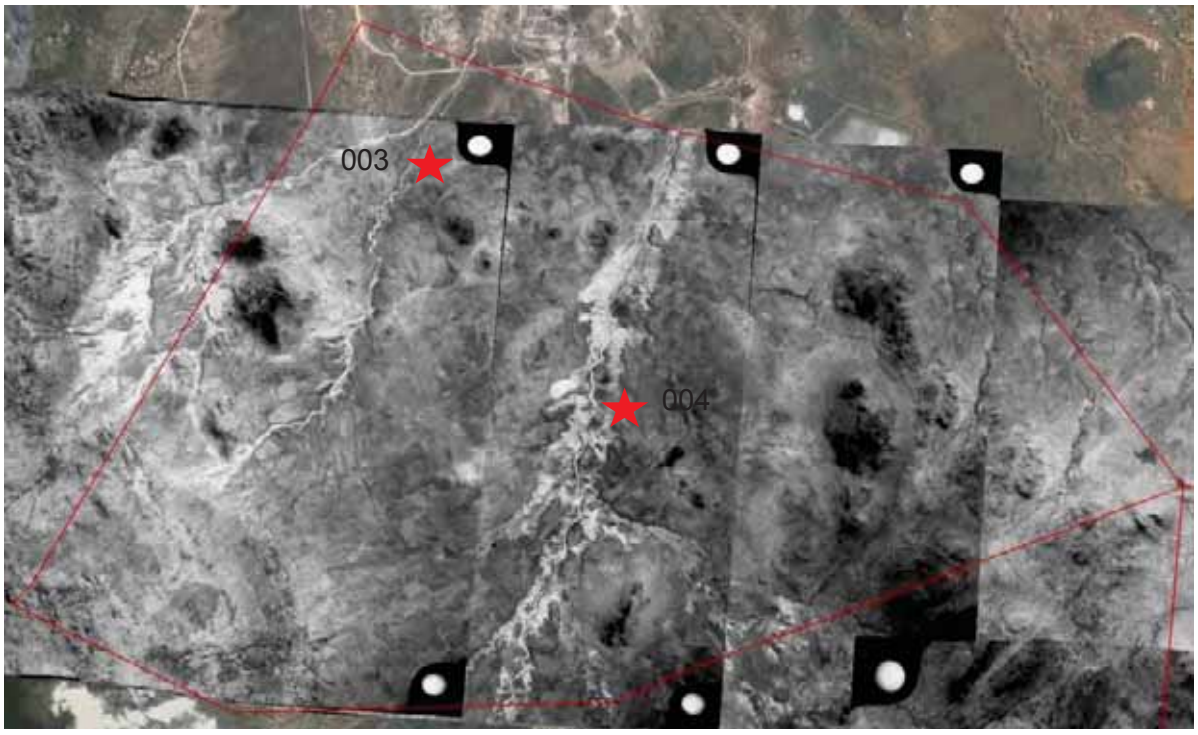


Figure 4-5: 1954 aerial imagery of Driekop 253KT showing the location of the proposed prospecting boreholes

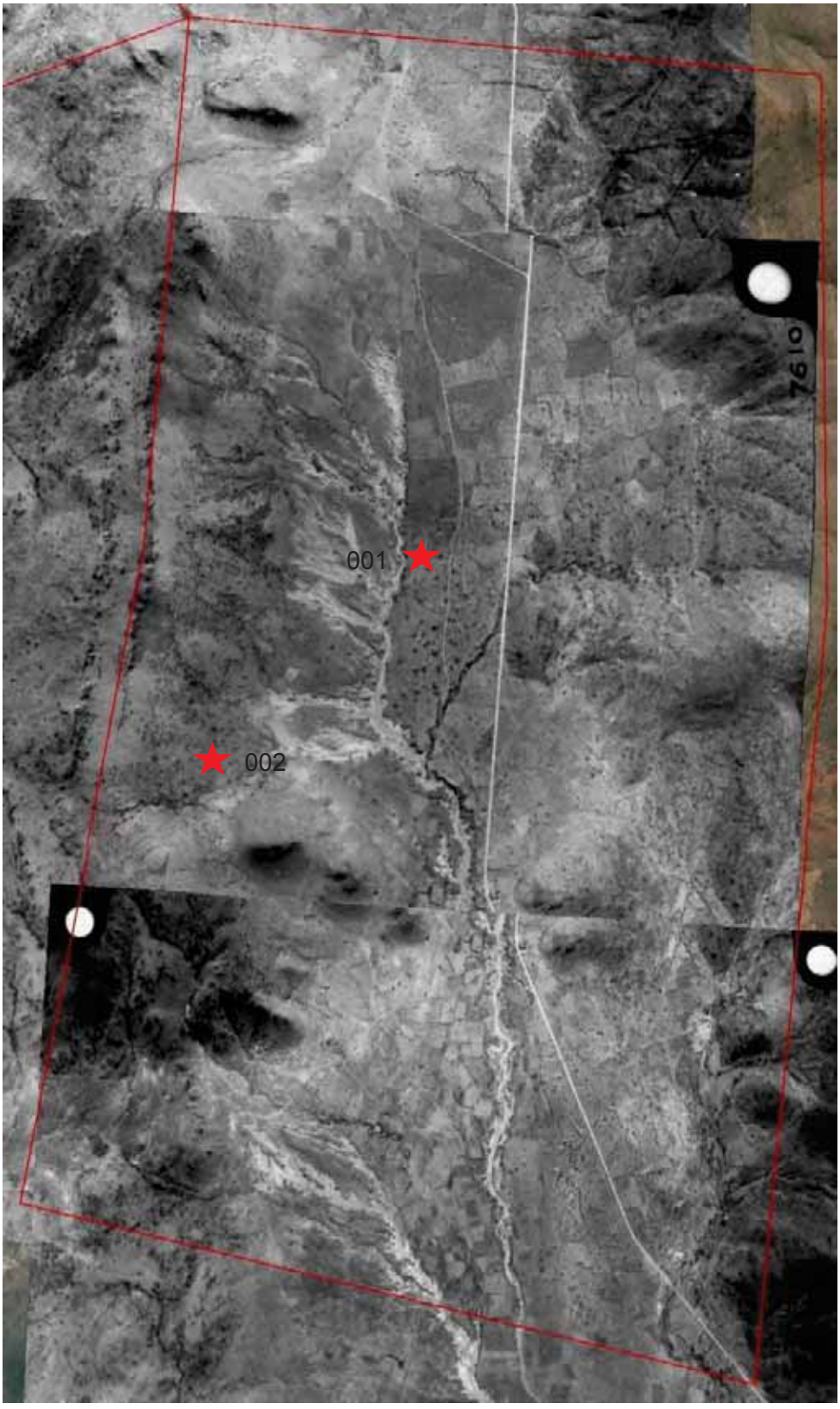
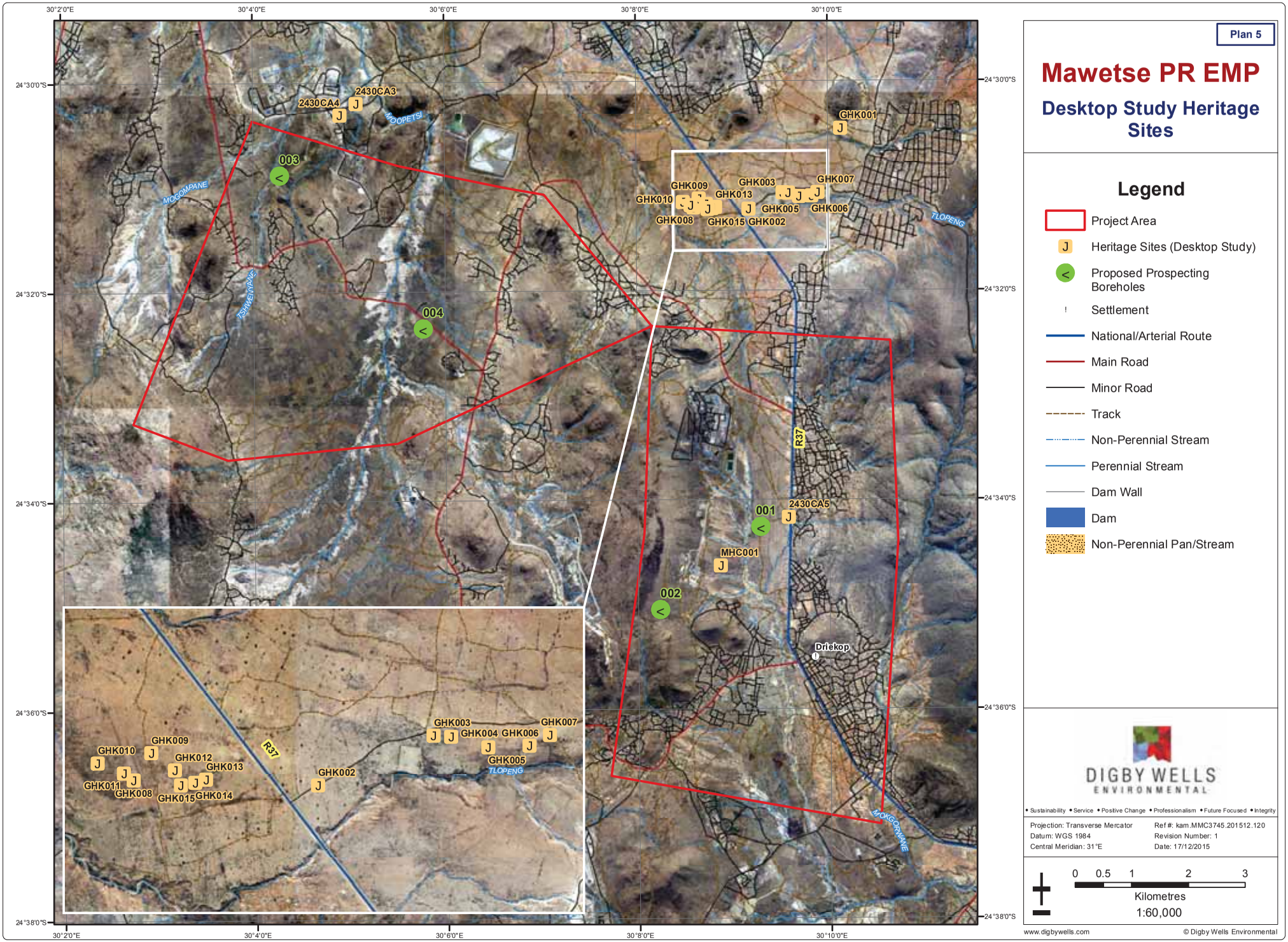


Figure 4-6: 1954 aerial imagery of Mooihoek 255KT showing the location of the proposed prospecting boreholes



Plan 5

Mawetse PR EMP

Desktop Study Heritage Sites

Legend

- Project Area
- Heritage Sites (Desktop Study)
- Proposed Prospecting Boreholes
- Settlement
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream

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4.2.5 Results of pre-disturbance survey

Borehole location 001 is pictured in the top left corner in Figure 4-7 below. Borehole location 002 was not visited as the access road had been washed away by recent heavy rains. The approximate location of Borehole 002 is depicted in the top right corner in Figure 4-7 below. Borehole location 003 is shown in the pictures in the middle row and Borehole 004 is presented in the bottom row of Figure 4-7 below.

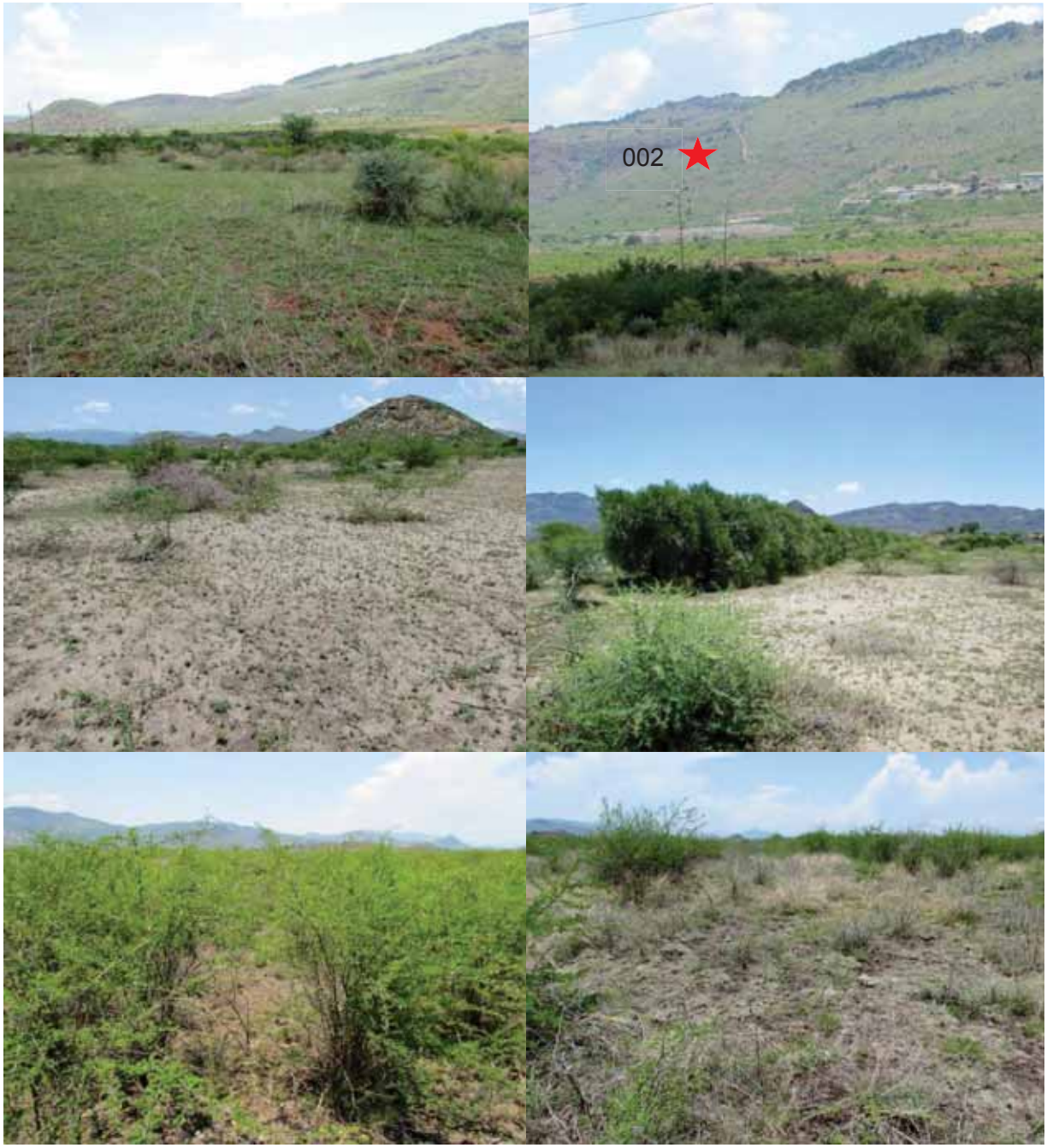
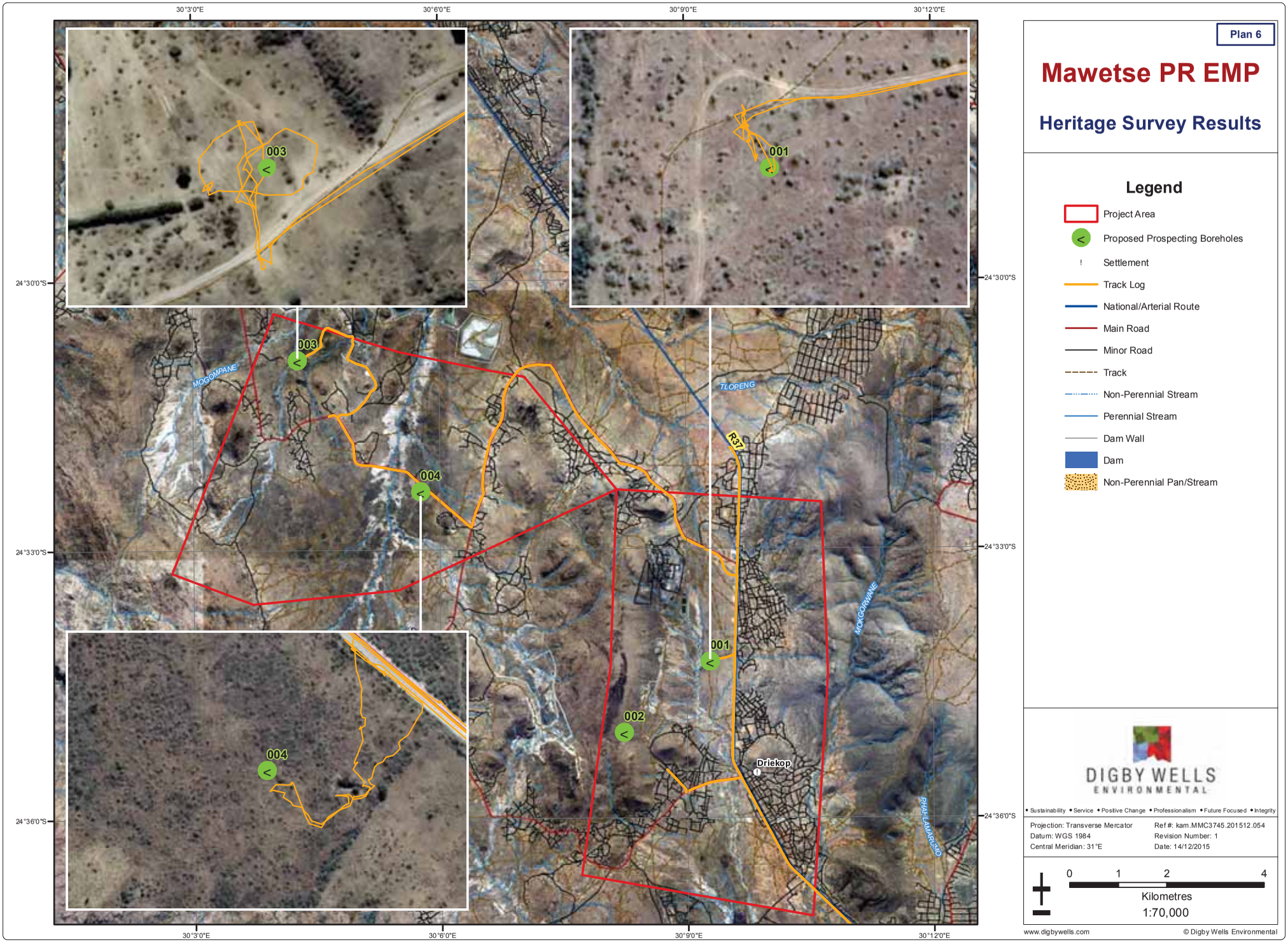


Figure 4-7: Current state of the landscape at borehole locations

The site specific study area is characterised by flat topography and dominated by patches of *Dichrostachys cinerea* (sickle bush). The soil type at borehole location 001 was a red sandy soil, while the soil type at 003 and 004 were dark brown/black clay. The boreholes 003 and 004 were located in floodplain areas hence the deep clay in those areas.

The three prospecting borehole locations visited were situated in old agricultural fields and had been previously disturbed by these activities. No heritage resources were identified within 100 m of the proposed prospecting borehole locations during the pre-disturbance survey (See Plan 6 below).



Plan 6

Mawetse PR EMP

Heritage Survey Results

Legend

- Project Area
- Proposed Prospecting Boreholes
- Settlement
- Track Log
- National/Arterial Route
- Main Road
- Minor Road
- Track
- Non-Perennial Stream
- Perennial Stream
- Dam Wall
- Dam
- Non-Perennial Pan/Stream

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5 Heritage Impact Assessment

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Project. No significant heritage resources were identified within 100 m of the proposed prospecting borehole locations during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, EFC sites, burial grounds and historical structures, though none were identified within 100 m of the prospecting borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey. While no impacts are envisioned for the two heritage resources identified within the proposed prospecting area, the CS of the heritage resources has been completed to assist with the implementation of the recommendations i.e. Chance Finds Procedures.

5.1 Cultural Significance

The assessment of CS considered criteria defined in Box 2 above. The CS assigned to the identified heritage resources is summarised in Table 5-1and presented in detail in Table 5-2.

Table 5-1: Summary of identified heritage resources

Summary of Identified Heritage Resources and CS	Number
Very High CS	**1**
Burial / grave	**1**
MHC001	1
Low CS	**1**
Early Farming Community Site	**1**
Lebalelo EFC Site	1
Grand Total	**2**

Table 5-2: Cultural Significance of identified heritage resources

Resource ID	Resource Period	Type	Description	Cultural Significance	CS Motivation	Field Rating Value	Field Rating	Field Rating Motivation Guidance	Field Rating Motivation
Lebalelo EFC Site	Early Farming Community (c. 200 CE to 1000 CE) (EFC)	Site	Early Farming Community site with seven storage pits containing ash, pottery and cattle dung. The occupational layers were identified 30cm below the surface.	Low	The site can be considered in particular dimensions against historical and scientific criteria.	2.00	General Protection IV B	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance	The heritage sites are defined according to section 2 of the NHRA and are generally protected under Section 35 of the NHRA

MHC001	Union of South Africa (1910 CE to 1961 CE)	Burial / grave	Single grave	High	The site can be considered in particular dimensions against historical and social criteria.	3.00	General Protection IV A	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance	The heritage sites are defined according to section 2 of the NHRA and are generally protected under Section 36 of the NHRA

The Lebalelo EFC site is of low CS as the integrity of the site has been reduced due to the construction of the Lebalelo Water Pipeline. If the site had not been disturbed, the CS would have been medium, requiring more in-depth mitigation measures.

The grave is of high CS due to the local significance of burial grounds to communities. This site should be avoided and clearly demarcated to ensure no accidental damage occurs.

5.2 Impact Assessment

No heritage resources were identified within 100 m of the prospecting boreholes. As such, no impact assessment has been conducted as part of this HBAR. Potential risks and unplanned events have been identified and are discussed below.

5.3 Unplanned Events and Low Risks

Risks are defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. These concepts are often misconstrued and lead to disproportionate amounts of effort spent on assessing minor risks with potentially insignificant impacts, at the cost of overlooking more important ones.

Broad mitigation and monitoring measures were provided for low risks and unplanned events **were not assessed in detail** (i.e., with significance ratings). In general monitoring is an accepted form of mitigation for low risks.

Certain project activities may represent low risks to heritage resources or cause unplanned events. Low risks, 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.

Based on the proposed project activities, potential unplanned events and the associated impacts and management measures have been identified and summarised in Table 5-3 below.

Table 5-3: Unplanned events and their management measures

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Accidental damage or destruction of identified heritage resources	Damage and/or destruction of heritage resources generally protected under section 34 to 37 of the NHRA	No prospecting activities can occur within 100 m of identified heritage resources. The identified heritage resources must be clearly demarcated to ensure no accidental damage occurs.
Accidental exposure of unidentified heritage resources	Damage and/or destruction of heritage resources generally protected under section 34 to 37 of the NHRA	Chance Finds Procedures (CFPs) must be developed and included as a condition of authorisation that clearly describes the reporting process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place as part of the prospecting activities

6 Recommendations

Chance Finds Procedures (CFPs) must be developed and included in the EMP that clearly describes the process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place.

Project specific monitoring and management measures must be developed as a condition of authorisation. The protocol must detail required monitoring activities, ideally during construction, administrative reporting structures and management / mitigation measures in the event of damage to structures generally protected under section 34 - 37 of the NHRA.

It is recommended that detailed CFPs must be developed, but as minimum, the following be included in the EMP.

- The Environmental Control Officer and/or contractors must inspect groundworks during site clearance;
- Should any heritage resources be uncovered during site clearance, the find must be stabilised and the site must be secured to protect it from further damage;
- The find must be reported and a qualified archaeologist must be contacted to assess the find;
- Should the find be significant, a report must be written regarding the find and any mitigation measures conducted. The report will include recommendations for any additional specialist work that may be necessary, or request approval to continue with the development.

7 Conclusion

The site specific project area is located 12.5 km north of Steelpoort, GTLM, Limpopo Province. Geologically, the site specific area is underlain by the Bushveld Complex which does not hold palaeontological resources and the paleontological sensitivity is negligible

Archaeologically, Stone Age, EFC, LFC, historical sites, and burial grounds have been recorded within the larger regional, local and site specific study areas under consideration here, though none of these sites have been identified within 100 m of the proposed prospecting boreholes.

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the Mooihoek and Driekop PRA. No significant heritage resources were identified within 100 m of the proposed prospecting boreholes during the desktop study. Heritage resources were identified at a local level including Stone Age surface occurrences, an EFC site and a grave, though none were identified near the borehole locations. No heritage resources or surface indicators of sub-surface heritage resources were identified during the pre-disturbance survey.

Potential risks to heritage resources include accidental damage or destruction to identified and un-identified heritage resources during site clearance for temporary road/route construction, prospecting sites and rehabilitation purposes.

Based on the findings of this report, Digby Wells recommends the following mitigation and management plans:

- Exemption from further palaeontological assessments for the proposed infrastructure footprint as the palaeo-sensitivity is insignificant;
- No prospecting activities can occur within 100 m of identified heritage resources;
- Chance Finds Procedures, must be developed and implemented as part of the EMP that clearly describe the reporting process and appropriate management of the exposure of previously unidentified heritage resources; and
- Additionally, should the prospecting prove to be successful and a Mining Right be applied for, a full HRM process should be implemented inclusive of a Heritage Impact Assessment (HIA).

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Appendix A: Specialist CV

NATASHA HIGGITT

Ms Natasha Higgitt

Assistant Heritage Consultant

Social Department

Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2010)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Assistant Heritage Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 FIELD EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape
- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape

- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Notification of Intent to Develop for the Doornkloof Flood Remedial Measures Project, Centurion, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Oakleaf Open Cast Coal Mine, Bronkhorstspruit, Gauteng Province for Oakleaf Resources (Digby Wells Environmental)
- Notification of Intent to Develop for the Rietfontein 101IS Prospecting Project for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Impact Assessment for the Weltevreden Open Cast Coal Mine, Belfast, Mpumalanga for Northern Coal (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop for the Grootegeluk Expansion Project, Lephalale, Limpopo Province for Exxaro Resources (Pty) Ltd (Digby Wells Environmental)
- Notification of Intent to Develop and Heritage Statement for the London Road Petrol Station, Alexandria, Gauteng for ERM Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Roodepoort Strengthening Project, Roodepoort, Gauteng for Fourth Element (Digby Wells Environmental)
- Heritage Statement for the Stoffel Park Bridge Upgrade, Mamelodi, Gauteng for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement for the Witrand Prospecting EMP, Bethal, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for the Onverwacht Prospecting EMP, Kinross, Mpumalanga for Rustenburg Platinum (Digby Wells Environmental)
- Heritage Statement for a Proposed Acetylene Gas Production Facility, located near Witkopdorp, Daleside, south of Johannesburg, Gauteng Province for Erm Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Platreef Platinum Project, Mokopane, Limpopo for Platreef Resources (Digby Wells Environmental)
- Heritage Statement for ATCOM and Tweefontein Dragline Relocation Project, near Witbank, Mpumalanga Province for Jones and Wagner Consulting Civil Engineers (Digby Wells Environmental)

- Heritage Statement Report for the Wilgespruit Bridge Upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement Report for the Kosmosdal sewer pipe bridge upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mnquma Municipality, Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)

- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association (SAMA): Member

Mr. Justin du Piesanie

Heritage Management Consultant: Archaeologist

Social Sciences Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
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
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Period	Company	Title/position
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 Professional Affiliations

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

5 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

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyerdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments incompliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have work throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
De Brochen and Booysendal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booysendal	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com

Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Batlhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Batlhako Mine Expansion Area	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Orientale Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Orientale Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldreources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	Heritage Consultant	6 months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	Heritage Impact Assessment	Heritage Consultant	4 months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd

SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	Heritage Impact Assessment	Heritage Consultant	2 months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	Heritage Consultant	2 months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinsglobal.com
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com

Nzoro 2 Hydro Power Project	Orientale Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	On-going	Randgold Resources	Completed introductory meetings – project on-going	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	ERGO Greg Ovens Greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Orientale Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	On-going	Gold One International	Project is on-going	Gold One International

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist
	Rock Art Mapping Project	Resident archaeologist

2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A

6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.

Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

7.1 Archaeological Surveys and Impact Assessments

- 2003-2004. Freelance consulting archaeologist. Roodt & Roodt CC. RSA. Archaeological surveys. Specialist.
- 2004-2005. Resident archaeologist Rock Art Mapping Project. University of KwaZulu-Natal. Kwazulu-Natal, RSA. Rock art mapping & recording. Specialist.

7.2 Archaeological Mitigation

- 2007. Archaeological investigation of Old Johannesburg Fort. Johannesburg Development Agency. Gauteng, RSA. Archaeological mitigation. Project manager.
- 2008. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Watching Brief. Project manager.
- 2011. Sessenge archaeological site mitigation. Randgold Resources. Doko, DRC. Archaeological mitigation. Specialist.
- 2011. Mitigation of three sites, Koidu Kimberlite Project. Koidu Holdings SA. Koidu, Sierra Leone. Archaeological mitigation. Project manager.
- 2012. Boikarabelo Phase 2 Mitigation of Archaeological Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2012. Additional Archaeology Mitigation of Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
- 2013. Archaeological Excavations of Old Well, Rhodes University, Grahamstown. Rhodes University. Eastern Cape, RSA. Archaeological mitigation. Specialist.
- 2014. Archaeological Site Destruction. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.

7.3 Heritage Impact Assessments

- 2005. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Go-Enviroscience. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
- 2006. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. ERM Southern Africa (Pty) Ltd. Northern & Eastern Cape, RSA. Heritage Scoping Assessment. Project manager.
- 2007. Proposed road upgrade of existing, and construction of new roads in Burgersfort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2007. Recommendation of Exemption: Above-ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Sasol Group Services (Pty) Ltd. Free State, RSA. Letter of Exemption. Project manager.
- 2008. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Archaeological Impact Assessment. Project manager.
- 2008. Van Reenen Eco-Agri Development Project. Go-Enviroscience. Kwazulu-Natal & Free State, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Scoping Assessment. Project manager.
- 2008. Randwater Vlakfontein-Mamelodi water pipeline survey. Archaeology Africa CC. Gauteng, RSA. Heritage Impact Assessment. Specialist.
- 2010. Heritage Impact Assessment for conversion of PR to MRA. Georock Environmental. Northwest, RSA. Heritage Impact Assessment. Project manager.
- 2010. Temo Coal Project. Namane Commodities (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
- 2011. Marapong Treatment Works. Ceenex (Pty) Ltd. Limpopo, RSA. Archaeological Impact Assessment. Project manager.

- 2011. Complete Environmental Authorisation. Rhodium Reefs Ltd. Limpopo, RSA. Archaeological Impact Assessment. Specialist.
- 2011. Big 5 PV Solar Plants. Orlight (Pty) Ltd. Western and Northern Cape, RSA. Heritage Impact Assessment. Specialist.
- 2011. Heritage Impact Assessment for Koidu Diamond Mine. Koidu Holdings SA. Koidu, Sierra Leone. Heritage Impact Assessment. Specialist.
- 2012. TSF and Pipeline. Gold One. Gauteng, RSA. Heritage Impact Assessment. Project manager.
- 2012. Kangra Coal Heritage Screening Assessment. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Screening Assessment. Project manager.
- 2012. Environmental and Social Studies. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage specialist advice. Project manager.
- 2012. ESKOM Powerline EIA. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
- 2012. Falea Project ESIA. Denison Mines Corp. (Rockgate Capital Corp). Falea, Mali. Heritage Impact Assessment. Specialist.
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Appendix B: Impact Assessment Methodology

DIGBY WELLS
ENVIRONMENTAL

Heritage Resources Management: Assessment Matrix Methodology

Methodology Statement

October 2015

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This document has been prepared by Digby Wells Environmental.

Report Type:	**Methodology Statement**
Project Name:	**Heritage Resources Management: Assessment Matrix Methodology**

Name	Responsibility	Signature	Date
Johan Nel	HRM Unit Manager		23 October 2015

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This methodology provides an objective manner in which to evaluate the way in which project activities interact with cultural heritage resources. This interaction may result in an impact, adverse or beneficial, wholly or partially resulting from organisations activities.

In terms of heritage management, potential impacts to heritage resources must be assessed relative to the significance of the resource. The methodology employed in the assessment of potential impacts is discussed in more detail below.

2 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance[1] of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used.

This matrix takes into account heritage resources assessment criteria set out in subsection 3(3) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) (see Box 1), which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance can is summarised in Box 2.

Dimension		Attributes considered	NHRA Ref.
Aesthetic & technical	1	Importance in aesthetic characteristics	S.3(3)(e)
	2	Degree of technical / creative skill at a particular period	S.3(3)(f)
Historical importance & associations	3	Importance to community or pattern in country's history	S.3(3)(a)
	4	Site of significance relating to history of slavery	S.3(3)(i)
	5	Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)
Information potential	6	Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)
	7	Information potential	S.3(3)(c)
	8	Importance in demonstrating principle characteristics	S.3(3)(d)
Social	9	Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)

Box 1: NHRA section 3 criteria

The rationale behind the heritage value matrix takes into account the fact that a heritage resource's value is a direct indication of its sensitivity to change (impacts). Value therefore needs to be determined prior to the completion of any assessment of impacts.

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

This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social.

Value = Importance x Integrity

where

Importance = average sum

of

Aesthetic + Historic + Scientific + Social

Box 2: CS formula

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. The South African Heritage Resources Agency (SAHRA) has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 3-1.

3 Field Rating

Although grading of heritage resources remains the responsibility of Heritage Resources Authorities (HRAs), SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

Field Rating = average sum

of

Aesthetic + Historic + Scientific + Social

Box 3: Field rating formula

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings is summarised in Box 3. The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are is presented in Table 3-1.

Table 3-1: Ratings and descriptions used in determining CS and field ratings

Rating	IMPORTANCE *A heritage resource's contribution to aesthetic, historic, scientific and social value.*	INTEGRITY *The undivided or unbroken state, material wholeness, completeness or entirety of a resource or site*	FIELD RATING *Recommended grading of identified heritage resources in terms of NHRA Section 7*
-	Not assessed - dimension and/or attribute not considered in determining value.		Not assessed - dimension and/or attribute not considered in field rating.
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost	
1	Common, well represented throughout diverse cultural landscapes	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance *Grade IV C*
2	Generally well represented but exhibits superior qualities in comparison to other similar examples	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance *Grade IV B*
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.	Fabric well preserved, good quality information and meaning evident, limited encroachment	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance *Grade IV A*
4	Rare and uncommon, value of national importance	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with High significance *Grade III B*
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.		Resources under general protection in terms of NHRA sections 34 to 37 with Very High significance *Grade III A*
6			Heritage resources under formal protection that can be considered to have special qualities which make them significant within the context of a province or a region *Grade II*
7			Heritage resources under formal protection that can be considered to have special qualities which make them significant within a national and / or international context. *Grade I*

4 Impact Assessment Methodology

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

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

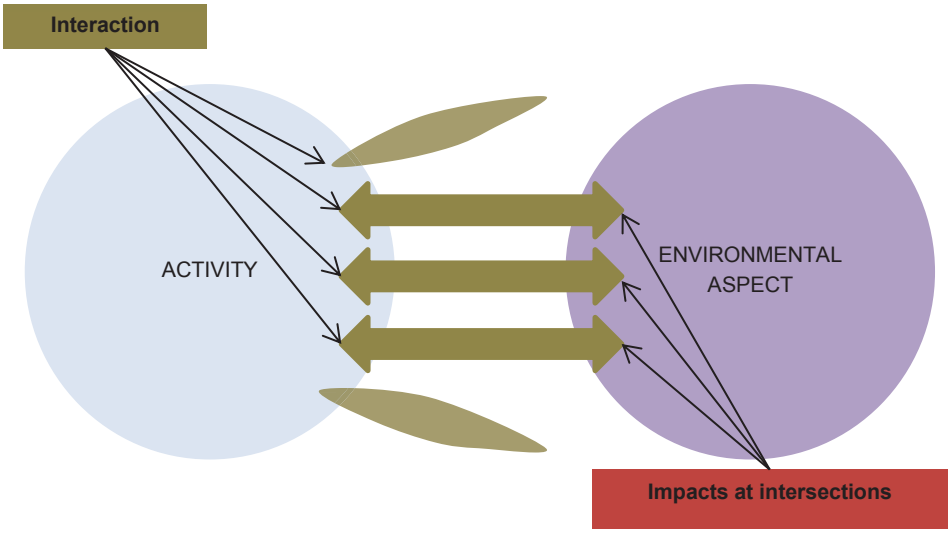

Figure 4-1: Graphical representation of impact assessment concept

The potential impacts were considered through an examination of the project phase and activity, the environmental aspect, the interdependencies between aspects, an assessment

and classification of categories, and consideration of the potential impact on heritage resources. An example of this process is presented in Figure 4-2

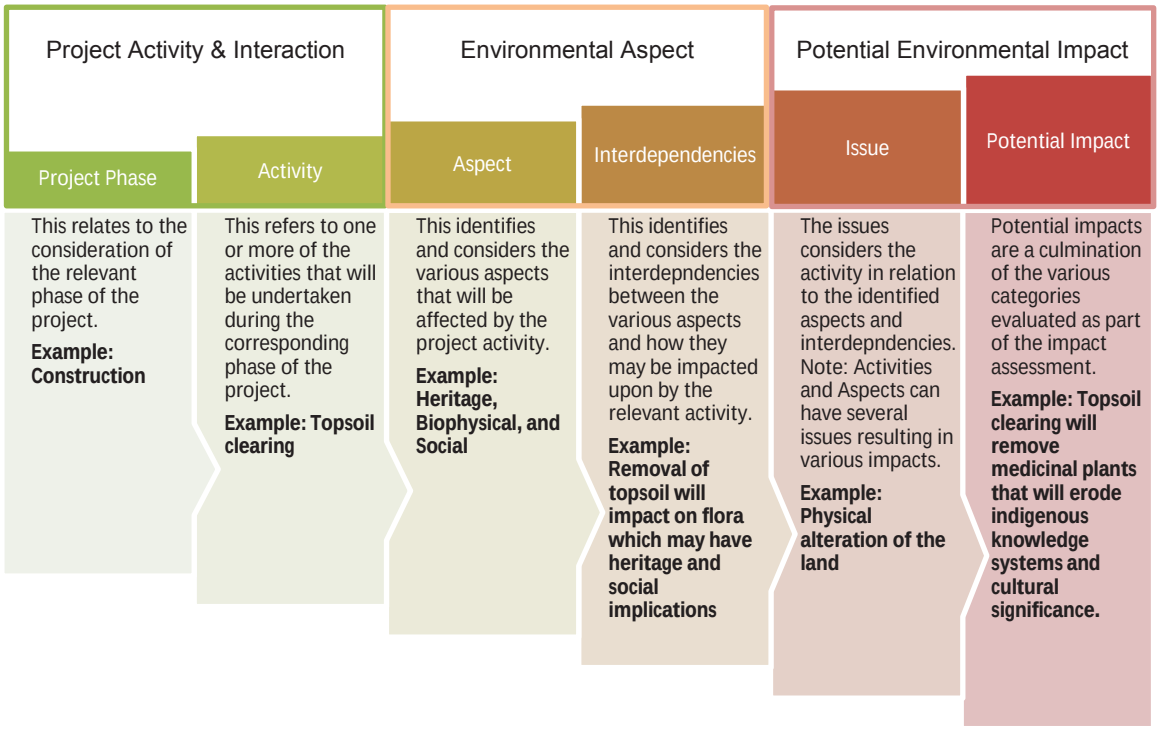

Figure 4-2: Example of how potential impacts were considered

4.1 Defining Heritage Impacts

Different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can, therefore, generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its 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** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
  - **Additive**: the simple sum of all the effects, e.g. the 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.

The relevance of the distinction to defining the study areas arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

In addition, the NHRA requires that heritage resources are graded 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.

4.2 Impact Assessment

The impact rating process is designed to provide a numerical rating of the identified heritage impacts. The significance rating follows an established impact/risk assessment formula is shown in Box 5.

The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 4-2 below.

Project-related impacts on heritage resources have taken into account the inherent value of heritage resources, described above, and only applied to resources with values above negligible. As a result, the impact assessment did not consider individual resources, but was applied to diverse resources grouped in terms of similar values.

The magnitude was then applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation will not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required. This may include alteration, restoration or demolition of structures under a permit issued by the HRAs.

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

where:

Consequence = type of impact x (Intensity + Spatial Scale + Duration)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

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

Box 5: Impact assessment formula

Impacts were rated prior to mitigation and again after consideration of the proposed mitigation measures. Impacts were then categories into one of eight categories listed in Table 4-2. The relationship between the consequence, probability and significance ratings is also graphically depicted in Table 4-2.

Table 4-1: Description of duration, extent, intensity and probability ratings used in impact assessment

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
7	**Permanent**	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	**International**	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	**Extremely high**	Major change to Heritage Resource with High-Very High Value	**Certain/Definite**	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	**Beyond Project Life**	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	**National**	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	**Very high**	Moderate change to Heritage Resource with High-Very High Value	**High probability**	Happens often. It is most likely that the impact will occur.
5	**Project Life**	The impact will cease after project life.	**Region**	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	**High**	Minor change to Heritage Resource with High-Very High Value	**Likely**	Could easily happen. The impact may occur.
4	**Long Term**	Impact will remain for >50% - Project Life	**Municipal area**	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	**Moderately high**	Major change to Heritage Resource with Medium-Medium High Value	**Probable**	Could happen. Has occurred here or elsewhere
3	**Medium Term**	Impact will remain for >10% - 50% of Project Life	**Local**	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	**Moderate**	Moderate change to Heritage Resource with Medium - Medium High Value	**Unlikely / Low probability**	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.
2	**Short Term**	Impact will remain for <10% of Project Life	**Limited**	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site specific study area.	**Low**	Minor change to Heritage Resource with Medium - Medium High Value	**Rare / Improbable**	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	**Transient**	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	**Very Limited**	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	**Very low**	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	**Highly Unlikely /None**	Expected never to happen. Impact will not occur.

Table 4-2: Impact significance ratings, categories and relationship between consequence, probability and significance

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

Relationship between consequence, probability and significance ratings

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

5 Mitigation Measures and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended in this section comply with the General Principles set out under section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as published in SAHRA Minimum Standards[2] (See Box 4).

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)
Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

Box 4: Recommended minimum level of required mitigation

Recommended mitigation is therefore divided into two categories: *project related* and *mitigation of heritage resources* defined below.

- Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:
  - In situ preservation (i.e. no-development) of heritage resources for which Conservation Management Plans (CMPs) are required; and
  - Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.
- Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:
  - Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;

[2] It must be noted that these minimum standards serve as a guide, and the recommendations provided in this HIA are project specific.

- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
- Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

The post-mitigation rating provided an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

Appendix C: Site List

Map ID	Site ID	Latitude	Longitude	Cultural Affinities	Description	Reference
2430AC1	2430AC1	-24.498333	30.001944	Farming Community	LIA (Dsjate)	WITS Archaeological Site Database
2430AC2	2430AC2	-24.466667	30.038611	Farming Community	LIA (Hackney)	WITS Archaeological Site Database
2430AC3	2430AC3	-24.466667	30.042222	Farming Community	LSA shelter (Hackney)	WITS Archaeological Site Database
2430AC4	2430AC4	-24.480833	30.029722	Historic	Sekwati's grave	WITS Archaeological Site Database
2430AC5	MAPID_02318_Site1	-24.481528	30.112694	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Matadi 1)	Huffman and Schoeman 2001
2430AC6	MAPID_02318_Site2	-24.48325	30.111778	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Matadi 2)	Huffman and Schoeman 2001
2430CA3	MAPID_02318_Site3	-24.503333	30.084611	Farming Community	Stone features, grinding stones, pottery and grain bin foundations (Clapham 1)	Huffman and Schoeman 2001
2430CA4	MAPID_02318_Site4	-24.505167	30.081778	Farming Community and Burial Grounds and Graves	Stone features, grinding stones, pottery and grain bin foundations with several graves (Clapham 2)	Huffman and Schoeman 2001
2430CA5	2430CA5	-24.569481	30.159583	Farming Community	EFC storage pits containing pottery, ash and cattle dung	WITS Archaeological Site Database
GHK001	MAPID_02254_GHK001	-24.507583	30.168889	Burial Grounds and Graves	Possible grave	Hutten, 2008
GHK002	MAPID_02254_GHK002	-24.520389	30.152861	Farming Community	Lower grinding stone and undiagnostic potsherds	Hutten, 2008
GHK003	MAPID_02254_GHK003	-24.517806	30.158833	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK004	MAPID_02254_GHK004	-24.517861	30.15975	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK005	MAPID_02254_GHK005	-24.518417	30.161667	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK006	MAPID_02254_GHK006	-24.518333	30.163806	Farming Community	Dilapidated stone structure with lower grinding stone	Hutten, 2008
GHK007	MAPID_02254_GHK007	-24.517778	30.164861	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK008	MAPID_02254_GHK008	-24.520139	30.143306	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK009	MAPID_02254_GHK009	-24.518722	30.144222	Farming Community and Burial Grounds and Graves	Dilapidated stone structure with three possible graves	Hutten, 2008
GHK010	MAPID_02254_GHK010	-24.51925	30.141444	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK011	MAPID_02254_GHK011	-24.519778	30.142806	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK012	MAPID_02254_GHK012	-24.519611	30.145444	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK013	MAPID_02254_GHK013	-24.520083	30.147056	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK014	MAPID_02254_GHK014	-24.52025	30.1465	Farming Community	Dilapidated stone structure	Hutten, 2008
GHK015	MAPID_02254_GHK015	-24.520389	30.14575	Farming Community	Dilapidated stone structure	Hutten, 2008
2429BD25	MAPID_02317	-24.291667	29.844444	Middle Stone Age	Surface occurrence of flakes and cores	Van Schalkwyk, 2001
LEB1	2005-SAHRA-0260/LEB1	-24.96467	30.10324	Farming Community	Middle Iron Age ceramics, decorated and undecorated, located in a badly eroded area	Birkholtz and Steyn, 2005
LEB2	2005-SAHRA-0260/LEB2	-24.95968	30.09995	Farming Community	Iron Age ceramic surface scatter, mostly undecorated. Site is situated on the bank of a non-perennial stream.	Birkholtz and Steyn, 2005
LEB3	2005-SAHRA-0260/LEB3	-24.96084	30.10077	Farming Community	Lower grinding stone situated on the bank of a non-perennial stream	Birkholtz and Steyn, 2005
LEB4	2005-SAHRA-0260/LEB4	-24.96167	30.10134	Farming Community	Undecorated Iron Age ceramics near the bank of a non-perennial stream.	Birkholtz and Steyn, 2005
LEB5	2005-SAHRA-0260/LEB5	-24.96418	30.10232	Farming Community	Middle Iron Age ceramics, decorated and undecorated, located in a badly eroded area	Birkholtz and Steyn, 2005
LEB6	2005-SAHRA-0260/LEB6	-24.96498	30.10288	Middle Stone Age	Two Stone Age lithics located in a badly eroded area.	Birkholtz and Steyn, 2005
LEB7	2005-SAHRA-0260/LEB7	-24.96437	30.10239	Middle Stone Age	Single Stone Age artifact located in a badly eroded area.	Birkholtz and Steyn, 2005
LEB8	2005-SAHRA-0260/LEB8	-24.96307	30.10151	Middle Stone Age	Two Stone Age flakes, one broken grinding stone as well as undecorated and decorated Middle Iron Age ceramics	Birkholtz and Steyn, 2005
Site 2	2003-SAHRA-0009/Site 2	-25.034722	30.095694	Farming Community	Metal slag and tuyère fragments in association with Eiland pottery	Roodt, January 2003
Site 11	2003-SAHRA-0009/Site 11	-25.035778	30.095361	Farming Community	Pedi style pottery fragments	Roodt, January 2003
Site 14	2003-SAHRA-0009/Site 14	-25.038111	30.094917	Farming Community	Terracing with high concentrations of pottery fragments	Roodt, January 2003
Site 15	2003-SAHRA-0009/Site 15	-25.039444	30.095528	Farming Community	Concentration of pottery fragments	Roodt, January 2003
Site 20	2003-SAHRA-0009/Site 20	-25.039861	30.088778	Farming Community	Eiland pottery concentration	Roodt, January 2003
Site 21	2003-SAHRA-0009/Site 21	-25.039583	30.088472	Farming Community	Half a bored stone and pottery concentration	Roodt, January 2003
Site 25	2003-SAHRA-0009/Site 25	-25.034278	30.086417	Farming Community	Concentration of pottery, hut rubble, metal working debris and terracing	Roodt, January 2003
Site 26	2003-SAHRA-0009/Site 26	-25.033194	30.087583	Farming Community	Pottery and tyuere fragments	Roodt, January 2003
Site 27	2003-SAHRA-0009/Site 27	-25.036667	30.087278	Farming Community	Concentration of pottery	Roodt, January 2003
Site 28	2003-SAHRA-0009/Site 28	-25.035528	30.086389	Farming Community	Pottery, hut rubble, metal working debris and terracing	Roodt, January 2003
MHC001	2430CA-MHC001	-24.5771832	30.1476753	Burial Grounds and Graves	One grave	Fourie, 2008