



**HERITAGE STATEMENT FOR THABAMETSI  
PROJECT, 2327CB,  
VAALPENSLOOP 313 LQ, LEPHALALE,  
LIMPOPO PROVINCE**

**EXXARO COAL (Pty) Ltd**

**OCTOBER 2012**

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**Report Title:** Heritage Statement for Thabametsi Project, 2327CB,  
Vaalpensloop 313 LQ, Lephalale, Limpopo Province

**Report type:** Baseline Heritage Statement Submitted to NHRA S.38(8)

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**Project Number:** EXX564

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## EXECUTIVE SUMMARY

### PURPOSE OF STUDY

A previous Phase 1 Heritage Impact Assessment (HIA) for the requirements of an Environmental Impact Assessment (EIA) that was to be completed for the proposed main Thabametsi opencast pit in 2009 was prepared by Dr Julius Pistorius (2010) for Golder Associates Africa (Pty) Ltd. The affected farms that were included in the HIA were:

- McCabesvley 311 LQ;
- Van Der Waltspan 310 LQ;
- Zaagput 307 LQ;
- Jackalsvley 309 LQ;
- Graafwater 456 LQ; and
- Goedehoop 467 LQ.

The original mine layout plan and infrastructure developments have changed since 2009 to include an additional opencast and underground mine with associated infrastructure development to the original main opencast pit and its associated infrastructure plan. Additionally, new infrastructure development will take place on the farm Vaalpensloop 313 LQ. The previous HIA did not include the new developments and the farm Vaalpensloop 313 LQ and it is now necessary to compile a Heritage Statement that will incorporate any new findings into the original heritage assessment.

The current heritage landscape of the Thabametsi Project area will be characterised to include existing and potential heritage resources. The following methods will be employed by the Heritage Statement:

- A literature review
  - A literature review of relevant and available published research such as academic journals and academic books;
  - Archival and background research; and
  - A review of existing heritage impact assessment reports.
- A cartographic survey
  - A desktop-based survey of existing historical to current aerial photography to complement historical research and identify potential heritage resources;
  - A desktop-based survey of historical to current topographical maps where relevant to determine the existence of potential heritage resources; and
  - A desktop-based survey of historical to current geological maps where relevant to determine the potential existence of palaeontology resources.

In preparing a palaeontological desktop study, the potentially fossiliferous rock units represented within the study area are determined from geological maps. The known fossil heritage within each rock unit is inventoried from the published scientific literature and previous palaeontological impact studies in the same region.

## SUMMARY OF FINDINGS

All heritage resources within the Thabametsi Project area that were identified from previous impact assessment reports were named using the original site name.

All other sites noted through the cartographic survey were named using the project code and Heritage Statement (HS) as a prefix with a short description after, for example EXX564/HS001-homestead.

During the cartographic survey and historical layering process, a total of four potential heritage resources were identified. These comprised of three homesteads and an old reservoir. In addition, two fields were identified in the historical aerial photographs. Based on the previous impact assessment by Pistorius (2010), who identified four graves in the greater Thabametsi Project area, there is a high probability for burial grounds and graves to exist in and around fields and near homesteads on the farm Vaalpensloop 313 LQ.

Pistorius (2010) also identified a historical house and Stone Age scatters in the wider Thabametsi Project area. There is a chance that Stone Age scatters also exist on the farm Vaalpensloop 313 LQ.

A desktop survey of the Council of Geoscience database and of relevant published scientific literature indicates that the geologic strata underlying the project area belongs to the Volksrust and Vryheid Formations of the Ecca Group of the Karoo Supergroup.

Although no published records of site locations of fossils in the study area exist, certain geological strata that occur in the study area are known to be fossiliferous. The available literature consulted spans a wide geographic range from the Mpumalanga Province to the Limpopo Province. The results show that the Karoo strata of the Limpopo Province have the potential to contain fossils.

## RECOMMENDATIONS

There is a low probability of terrestrial fossil bones being turned up in excavations into *in situ* deposits. With depth, it is possible that fossil plant and wood material, and peat layers, could be found. It is important to obtain samples of this material. Early Stone Age (ESA) and Middle Stone Age (MSA) stone tool artefacts may be found in scatters across the project area as well as buried in the upper part of excavations.

A previous impact assessment on the project area showed that burial grounds and graves exist near homesteads and in fields. It may therefore be possible for burial grounds and graves to exist in fields and around homesteads within the farm Vaalpensloop 313 LQ.

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Based on the above it is recommended that a Heritage Impact Assessment (HIA) be conducted for portion 1 and the Remaining Extent (REM) of the farm Vaalpensloop 313 LQ.

This Heritage Statement will be included in the Draft EIA Report to be submitted in accordance with the MPRDA. The HIA will be included in the Final EIA Report for both the MPRDA and NEMA processes.

## GLOSSARY OF ABBREVIATIONS AND TERMS

<b>ASAPA</b>	Association of Southern African Professional Archaeologists
<b>CE</b>	Common Era
<b>CM</b>	Continuous Miner
<b>DM</b>	District Municipality
<b>DMR</b>	Department of Mineral Resources
<b>EIA</b>	Environmental Impact Assessment
<b>EMP</b>	Environmental Management Plan
<b>ESA</b>	Early Stone Age
<b>Ha</b>	Hectares
<b>Heritage Statement</b>	This is also known as a Heritage Scoping Report and forms part of the overall Scoping report for the EIA
<b>HIA</b>	Heritage Impact Assessment
<b>LSA</b>	Later Stone Age
<b>MPRDA</b>	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
<b>MRA</b>	Mining Rights Application
<b>MSA</b>	Middle Stone Age
<b>NEMA</b>	National Environmental Management Act, 1998 (Act No. 107 of 1998)
<b>NHRA</b>	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
<b>NID</b>	Notice of Intent to Develop
<b>OBP</b>	Oliemboomspoor Shelter
<b>PHRA</b>	Provincial Heritage Resources Authority
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SAPS</b>	South African Police Services

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## **1 INTRODUCTION**

Exxaro Coal (Pty) Ltd (Exxaro) was granted a Prospecting Right in terms of Section 17 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) for the farms McCabesvley 311 LQ, Van Der Waltspan 311 LQ, Zaagput 307 LQ, Jackalsvley 309 LQ and Vaalpensloop 313 LQ in April 2007. A Mining Right Application (MRA) for the proposed Thabametsi Coal Mine (herewith referred to as the 'Thabametsi Project') was submitted to the Regional Office of the Department of Mineral Resources (DMR) in April 2012. The MRA was accepted by the DMR on 3 August 2012.

Exxaro is currently evaluating the potential mining of the coal reserves on the Thabametsi site. The Thabametsi site is an undeveloped coal resource situated approximately 15 km north and west of the existing Grootegeluk Coal Mine opencast pit. The proposed new Thabametsi Project will be run as an independent mine with the development of new infrastructure.

Golder Associates Africa (Pty) Ltd was appointed to conduct the baseline assessments and the compilation and submission of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the proposed main Thabametsi opencast pit (northern complex) in 2009. Due to uncertainties with regards to Independent Power Producers and issues outside Exxaro's control the project was put on hold. The original contract had therefore expired and Exxaro were required to re-start the project as clarity with regards to Independent Power Producers been resolved. Exxaro has now appointed Digby Wells Environmental (Digby Wells) to compile an EIA according to the MPRDA and the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

## **2 BACKGROUND INFORMATION OF PROJECT**

### **2.1 Project Details**

As part of the EIA, a heritage assessment is required for the project area. The heritage assessment will include a detailed and comprehensive baseline study, characterising the cultural landscape. With the intention of providing the relevant Heritage Resources Authority (HRA) with sufficient information to evaluate the heritage assessment, it is necessary to present a baseline account or scoping report in the form of a Heritage Statement. The relevant heritage authority will be notified in accordance with NEMA Regulation 54(2) via a Notice of Intent to Develop (NID) that will be informed and supported by this Heritage Statement.

A previous Phase 1 Heritage Impact Assessment (HIA) for the requirements of an EIA that was to be completed for the proposed main Thabametsi opencast pit in 2009 was prepared by Dr Julius Pistorius (2010) for Golder Associates Africa (Pty) Ltd. The affected farms that were included in the HIA were:

- McCabesvley 311 LQ;

- Van Der Waltspan 310 LQ;
- Zaagput 307 LQ;
- Jackalsvley 309 LQ;
- Graafwater 456 LQ; and
- Goedehoop 467 LQ.

The original mine layout plan and infrastructure developments have changed since 2009 to include an additional opencast and underground mining area, referred to as the southern complex, with associated infrastructure development to the original opencast pit and its associated infrastructure (referred to as the northern complex). Additionally, new infrastructure development will take place on the farm Vaalpensloop 313 LQ as part of the southern complex development. The previous HIA did not include the new developments and the farm Vaalpensloop 313 LQ and it is now necessary to compile a Heritage Statement that will incorporate any new findings into the original heritage assessment.

*This report constitutes a Heritage Statement for the farm Vaalpensloop 313 LQ of the proposed Thabametsi Project. This Heritage Statement will be included in the Draft EIA Report to be submitted in accordance with the MPRDA. The HIA will integrate the findings of the previous HIA conducted by Pistorius (2010) with the findings of the HIA conducted on Vaalpensloop 313 LQ. This HIA will then be included in the Final EIA Report for both the MPRDA and NEMA processes.*

## 2.2 Description of Property and Affected Environment

### 2.2.1 Location Data

*The Thabametsi Project is situated near the town of Lephalale in the Waterberg District Municipality (DM) of the Limpopo Province.*

A summary of the geographical location of the Thabametsi Project is presented in Table 2-1 below.

**Table 2-1: Geographical location of the Thabametsi Project area**

<b>Province</b>	Limpopo
<b>Municipality</b>	Lephalale Local Municipality
<b>15: 50 000 topographical map</b>	2327 CB
<b>Nearest town</b>	Steenbokpan
<b>Property / Farm name and number</b>	Vaalpensloop 313 LQ

<b>Approximate centre coordinates</b>	LAT/Y/South: -236975
	LON/X/East: 27.4732
<b>Current land use</b>	Private game reserves

### 2.2.2 Location Maps

The regional and local settings of the Thabametsi Project are depicted in Plan 1 and Plan 2 respectively. Land tenure of the Thabametsi Project is depicted in Plan 3. The development context of the Thabametsi Project area is depicted in Plan 4.

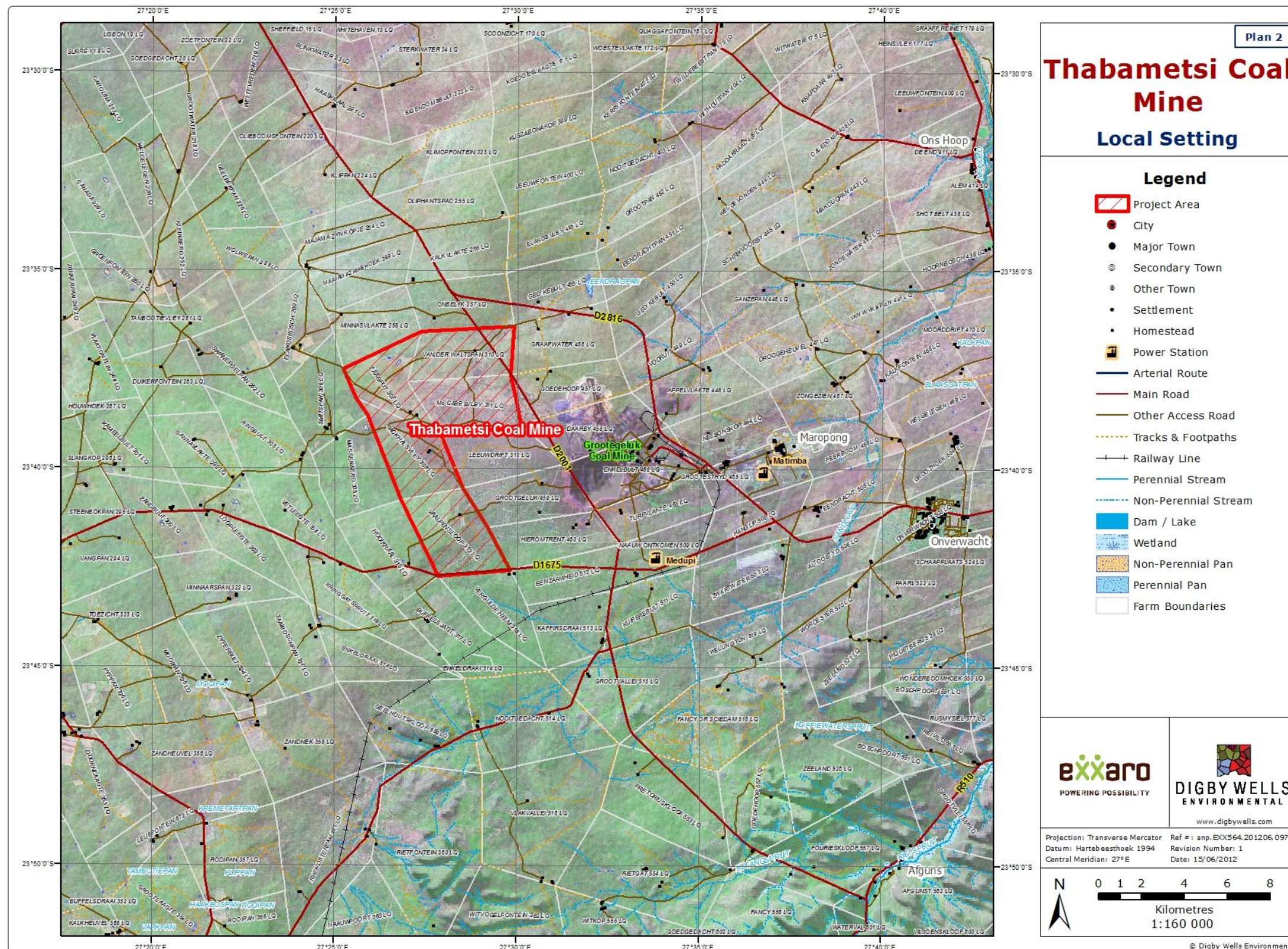
### 2.2.3 Site Maps

The site layout and infrastructure plans of the Thabametsi Project are depicted in Plan 5 and Plan 6.



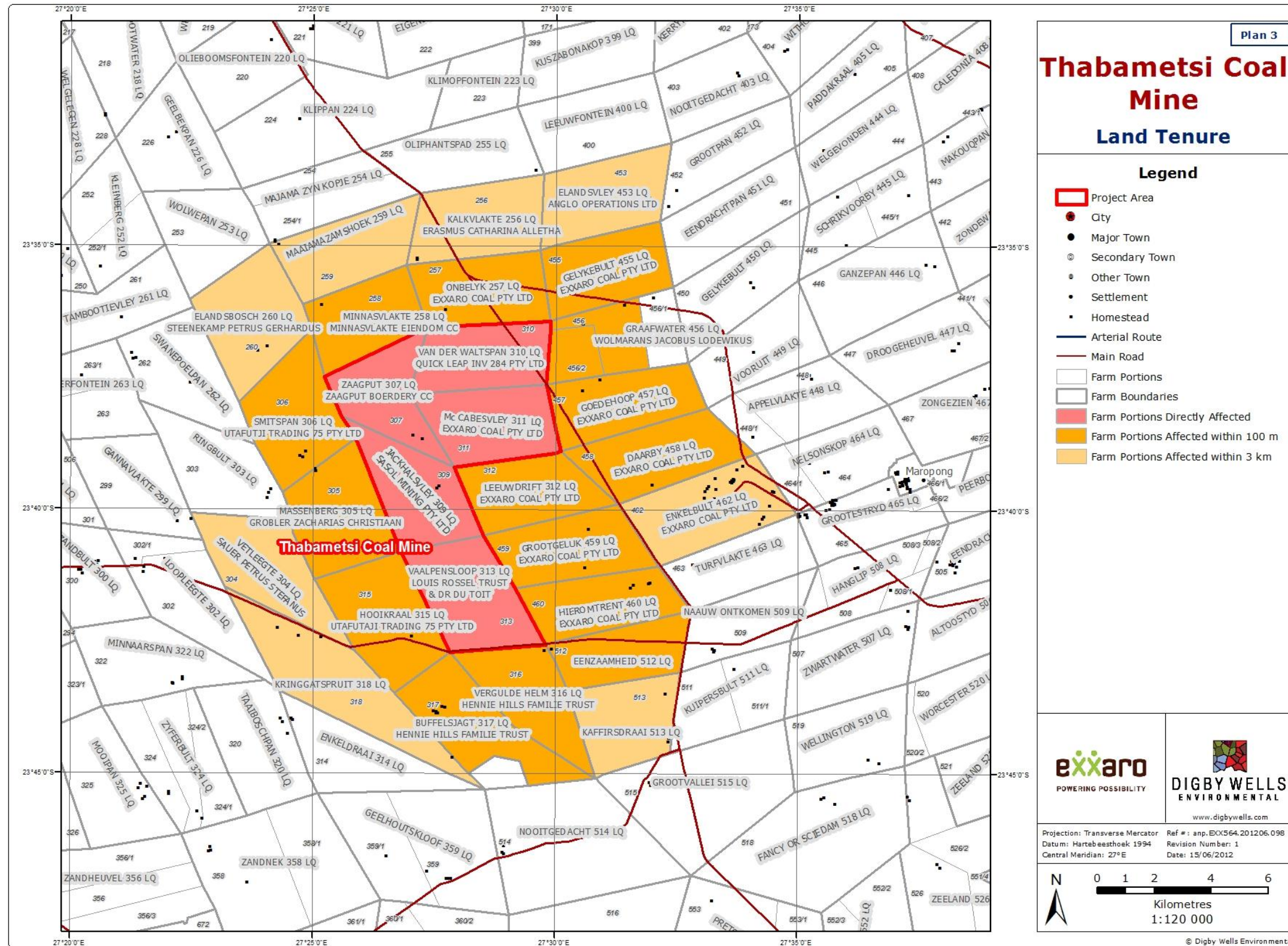






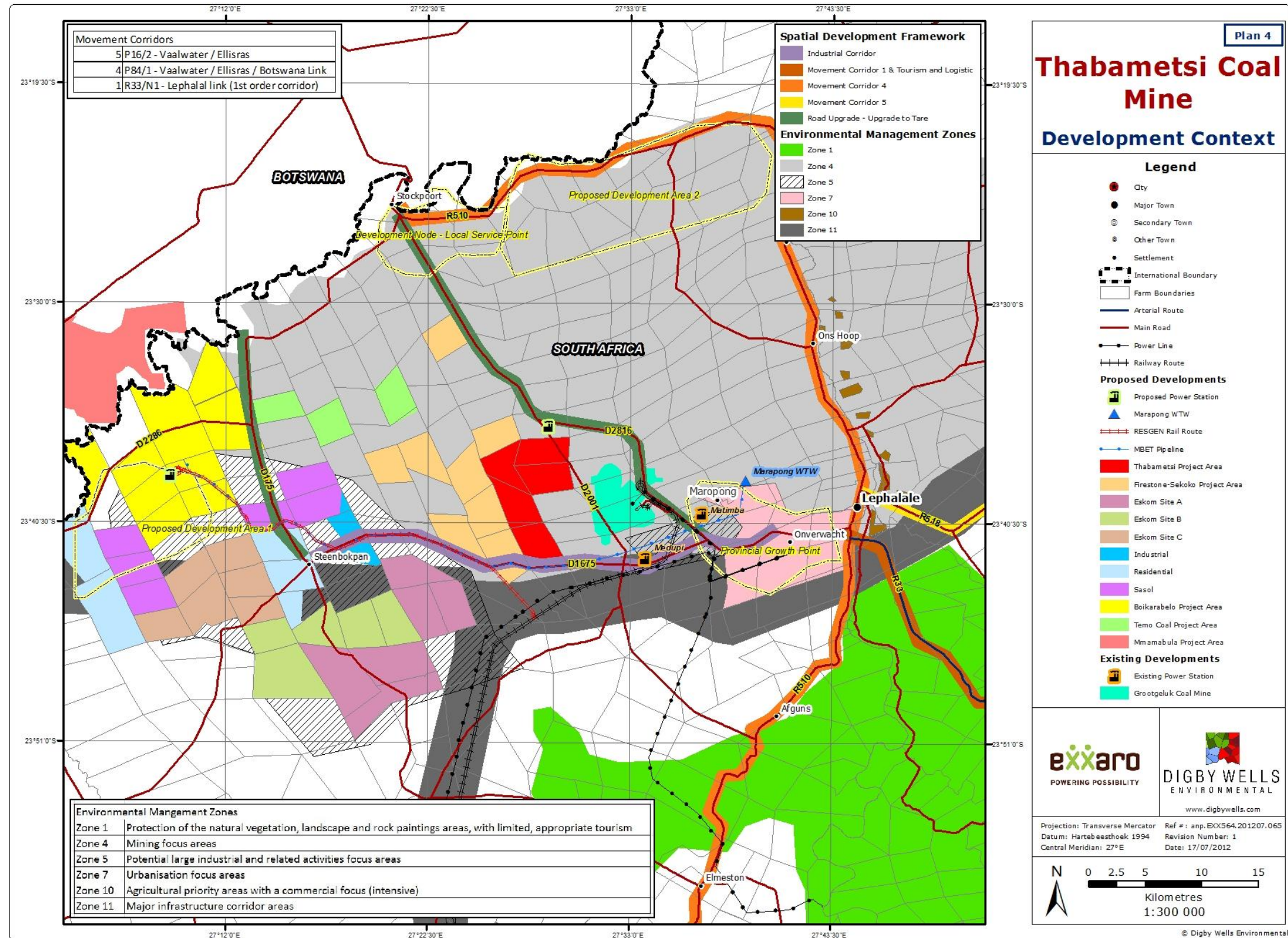
Plan 2: Local Setting of the Thabametsi Project





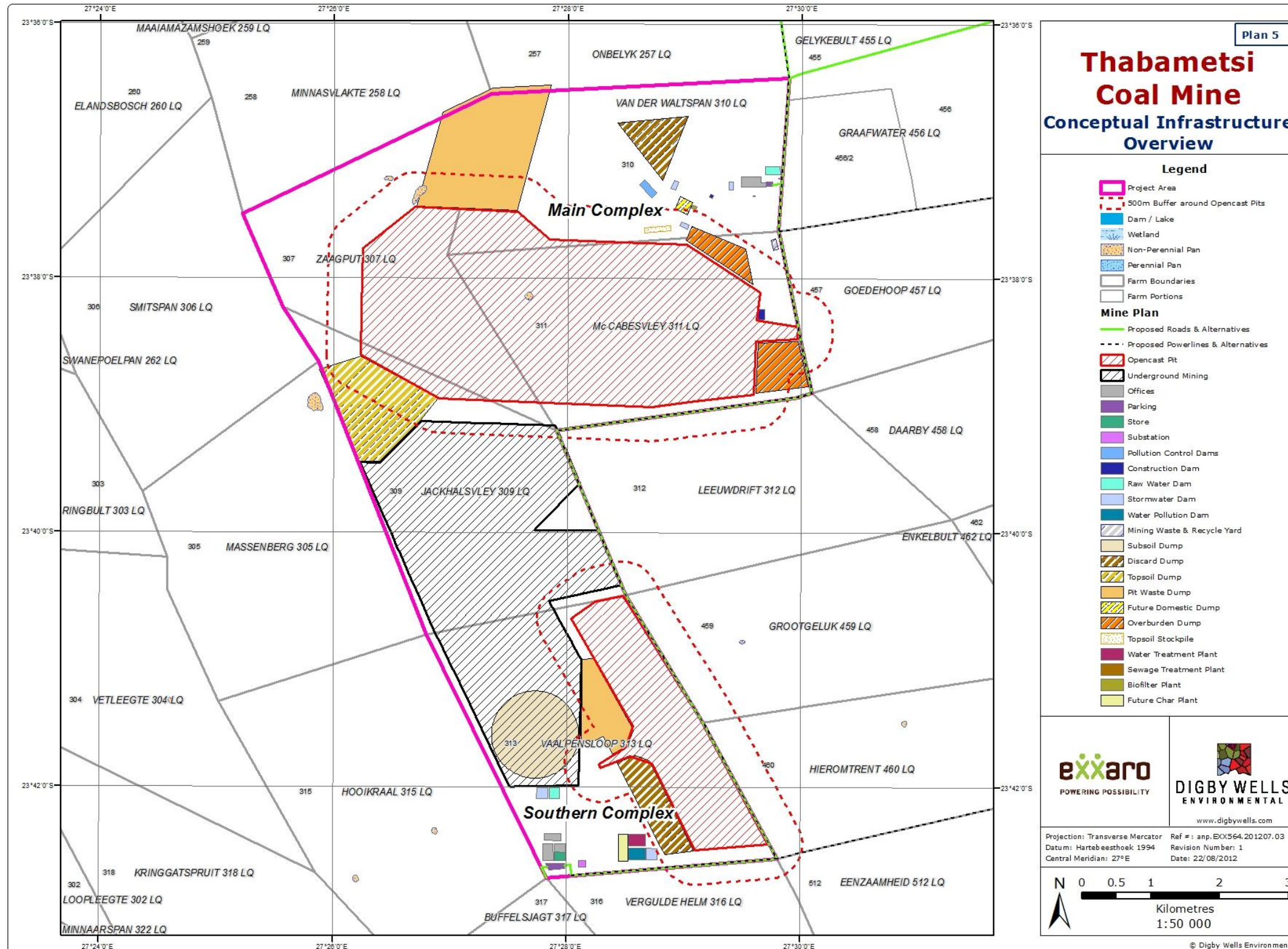
Plan 3: Land Tenure of the Thabametsi Project





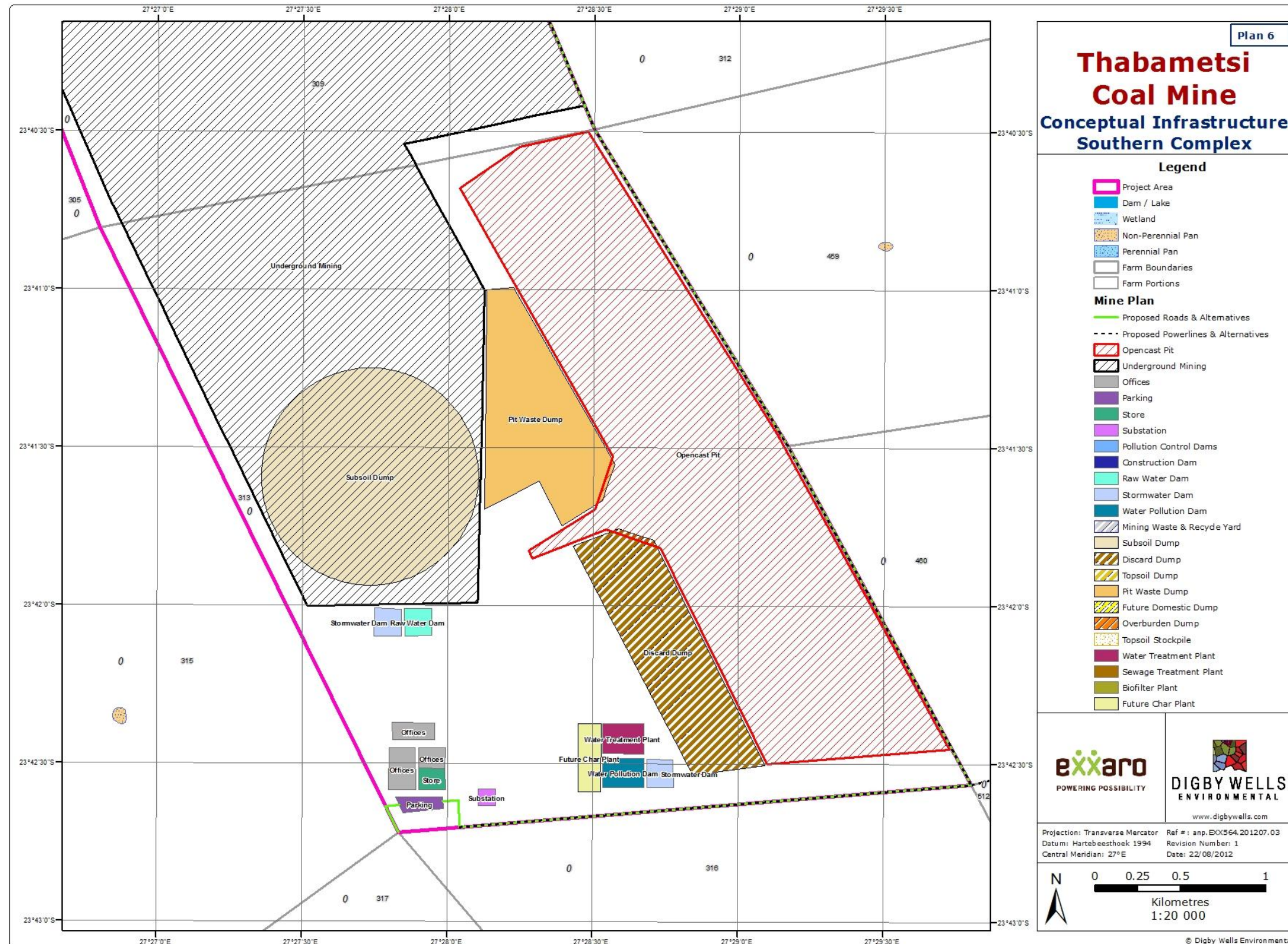
Plan 4: Development Context of the Thabametsi Project area





Plan 5: Infrastructure Plan Overview of the Thabametsi Project





Plan 6: Infrastructure Plan Overview on the Farm Vaalpensloop 313 LQ in the Southern Complex of the Thabametsi Project

## 2.2.4 Type of Development

*The objective of the proposed Thabametsi Project is to mine coal via opencast and underground mining methods on the farms McCabesvley 311 LQ, Van Der Waltspan 311 LQ, Zaagput 307 LQ, Jackalsvley 309 LQ and Vaalpensloop 313 LQ. The mine plan layout is depicted in Plan 5 and Plan 6.*

Truck and shovel opencast mining methodology will be used during the mining of the Northern Mine complex. The Northern Mine complex open pit will be established on the farms McCabesvley 311 LQ, advancing onto Zaagput 307 LQ and towards the later years of mining on the farm Van Der Waltspan 310 LQ. The open pit mining process involves various steps, classified sequentially as follows:

- Vegetation clearance;
- Strip and remove topsoil;
- Remove sub-soil;
- Drill and blast hard overburden;
- Load and haul the hard overburden;
- Clean the top of the coal;
- Drill and blast coal;
- Load and haul coal; and
- Backfill all waste according to the backfilling procedure.

The initial topsoil and subsoil will be hauled to a designated area and stored until it can be used for rehabilitation. The hard overburden will be drilled and blasted. The hard overburden and plant discard material will also be hauled to a designed dumping area during the initial state. When a steady state is reached, all waste materials will be backfilled and rehabilitation will commence as part of the backfilling process.

Underground mining will be located on the farms Jackalsvley 309 LQ and Vaalpensloop 313 LQ and will be known as the Southern Mine Complex. The underground board and pillar method with stooping will be used. The access will be achieved by a box-cut or opencast pit, in the lowest depth of the coal resource on the south-eastern corner of the farm Vaalpensloop 313 LQ. Coal from the opencast pit will be hauled to a crushing and screening plant from where it will be fed into the washing plant for further beneficiation. A plant discard area has been designed for the Southern Mine Complex.

## 2.2.5 Rezoning and/or Land Subdivision

*The properties are currently zoned for agriculture. Therefore, subdivision of land or rezoning may be required.*



## **2.2.6 Development context of Study Area: Lephalale Municipality Spatial Development Framework (LM-SDF), Lephalale Municipality Integrated Development Plan (LM-IDP) and Waterberg District Integrated Development Plan (WD-IDP)**

The Grootegeluk Coal Mine is located 5 km east of the Thabametsi Project and is the largest operating mine in the region. Existing power stations in the area include Matimba and Medupi (in construction), located 7 km and 12 km respectively to the south-east of the Thabametsi Project. Further projects in the region include the Exxaro Baseload Power Station to be built on one of the following adjacent farms Onbelyk 257 LQ, Gelykebult 455 LQ, Eendragtpan 451 LQ, and Vooruit 449 LQ (this project is in the Scoping phase and the preferred option / site for the construction are currently the farm Onbelyk 257 LQ. The final position will be determined during the EIA phase of the project); the proposed Sekoko Coal Project Area on the adjacent farms to the west; two further proposed power stations to be built to the northwest near the Botswana border; and various other projects on the farms to the west near the town of Steenbokpan. The development context of the study area is depicted in Plan 4.

The Lephalale Municipality Spatial Development Framework (LM-SDF), the Lephalale Municipality Integrated Development Plan (LM-IDP) and the Waterberg District Integrated Development Plan (WD-IDP) were reviewed to gain a more detailed understanding of the development context within which the Dalyshope Project area is situated. With regards to heritage, an understanding of the development context of the study area is important in order to assess and/or predict the magnitude of possible impacts on heritage resources that are identified in the study area. Cumulative impacts on heritage resources and the cultural landscape can also be more accurately addressed.

Lephalale is primarily a mining and industrial town with the main economic drivers being the Grootegeluk Coal Mine, the Matimba Power Station, and agriculture and tourism (Lephalale Municipality, 2012). According to the LM-IDP, due to its vast coal reserves the municipality is being considered for a third power station and coal to liquid manufacturing plant. The growth of Lephalale is expected to stem from possible developments in the mining sector.

Tourism has also been identified as a sector having a potential for growth and development. The Waterberg area is well-known for being a very scenic environment and it is rapidly becoming one of the best-known tourist destinations in the Limpopo Province (Lephalale Municipality, 2012). The value of the land is becoming increasingly obvious to prospective buyers and many farms are being converted into game reserves. There are several attractions in the municipality such as the Welgevonden Private Game Reserve, Mokolo Dam Nature Reserve, D’Nyala Nature Reserve and many other private reserves. A huge portion of the municipality is designated as a Biosphere Reserve. Another key tourism activity is hunting which attracts many overseas tourists. Most land is under private ownership and most of these landowners have converted their farms into private hunting farms (Waterberg District Municipality, 2010).

## 2.3 Relevant Contact Details

### 2.3.1 Developer/Client

**Table 2-2: Client Contact Details**

ITEM	COMPANY CONTACT DETAILS
Company	Exxaro Coal (Pty) Ltd
Contact person	Christo Reeders
Tel no	083 609 1270
E-mail address	<a href="mailto:christo.reeders@exxaro.com">christo.reeders@exxaro.com</a>
Postal address	PO Box 9229, Pretoria, 0001

### 2.3.2 Consultant

**Table 2-3: Consultant Contact Details**

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Johan Nel
Tel no	011 789 9495
Fax no	011 789 9498
E-mail address	<a href="mailto:johan.nel@digbywells.com">johan.nel@digbywells.com</a>
Postal address	Private Bag X10046, Randburg, Johannesburg, 2125

### 2.3.3 Land Owners

**Table 2-4: Land Owner Contact Details for Vaalpensloop 313 LQ**

ITEM	CONTACT DETAILS
Contact person	Mr Louis Rossel
Tel no	014 763 2280
E-mail address	<a href="mailto:louis.rossel@lowveldbus.co.za">louis.rossel@lowveldbus.co.za</a>

**Table 2-5: Land Owner Contact Details for Vaalpensloop 313 LQ (Portion 1)**

ITEM	CONTACT DETAILS
Contact person	Dr Carien du Toit
Tel no	083 236 3585
E-mail address	<a href="mailto:vastiretief@gmail.com">vastiretief@gmail.com</a>

## 2.4 Terms of Reference

Exxaro has requested Digby Wells to undertake an EIA in accordance with the MPRDA and the NEMA. Digby Wells has developed a Heritage Resources Management (HRM) process, aimed at expediting decisions by relevant Heritage Resources Authorities, and is firmly founded on the National Heritage Resources Act, 1999 (25 of 1999) (NHRA). This process is a phased approach aimed at integrating HRM with the NEMA and MPRDA process, and is described in more detail in the Methodology section of this report.

The Heritage Statement has been conducted on the farm Vaalpensloop 313 LQ and compiled for the Draft EIA process in accordance with the MPRDA. A full HIA will be conducted on the entire project area and compiled for the Final EIA process in accordance with both the MPRDA and NEMA processes.

## 2.5 Legislative Requirements

The required actions of a developer or project proponent in terms of heritage resources are defined by the following national legislation and international guidelines on best practice.

### South African Legislation

- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA); and
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);

### Standards and Regulations

- South African Heritage Resources Agency (SAHRA) Minimum Standards; and
- Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics.

### International Best Practise and Guidelines

- ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2010); and

- Applicable guidelines, charters and recommendations.

### 2.5.1 National Environmental Management Act, 107 of 1998 (NEMA)

HIAs are required in terms of the NEMA and relevant NEMA Regulations.

Principles for environmental management relevant to heritage resources management are highlighted in Section 2 of the NEMA:

- (2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably;
- (3) Development must be socially, environmentally and economically sustainable;
- (4)(a) Sustainable development requires the consideration of all relevant factors including that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied; and
- ((4)(o) The environment is held in public trust for the people the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

In addition to the above principles, the general objective of the environmental management relative to heritage resources management is illustrated in Section 23 of the NEMA:

- (2)(a) promote the integration of the principles of environmental management set out in [the Principles] into the making of all decisions which may have a significant effect on the environment; and
- (2)(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits, and promoting compliance with the principles of environmental management set out in section 2.

HIAs are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures in terms of the NEMA Section 24(7) considering heritage resources management are provided and must include:

- a. Investigation of the environment likely to be significantly affected by the proposed activity and alternatives thereto;
- b. Investigation of the potential impact. including cumulative effects, of the activity and its alternatives on the environment, socio-economic conditions and cultural heritage, and assessment of the significance of that potential impact;
- c. Investigation of mitigation measures to keep adverse impacts to a minimum, as well as the option of not implementing the activity;
- d. Public information and participation, independent review and conflict resolution in all phases of the investigation and assessment of impacts;

- e. Reporting on gaps in knowledge. the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;
- f. Investigation and formulation of arrangements for the monitoring and management of impacts, and the assessment of the effectiveness of such arrangements after their implementation;
- g. Co-ordination and co-operation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;
- h. That the findings and recommendations flowing from such investigation, and the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in section 2 are taken into account in any decision made by an organ of state in relation to the proposed policy, programme. plan or project; and
- i. That environmental attributes identified in the compilation of information and maps as contemplated in subsection (2)(e) are considered.

## 2.5.2 Mineral and Petroleum Development Act, 28 of 2002 (MPRDA)

The NEMA Principals outlined apply to all prospecting and mining operations in terms of the MPRDA Section 37.

HIAs are required in terms of integrated environmental management required in terms of Section 39 of the MPRDA, and that must reflect the general objective of the NEMA described above. In relation to heritage resources management, a specific MPRDA requirement in terms of Section 39 is to:

- (3)(b)(iii) investigate, assess and evaluate the impact of ... prospecting or mining operations on any national estate referred to in section 3(2) of the NHRA with the exception of the national estate as contemplated in section 3(2)(i)(vi) and (vii) [objects of scientific or technological interest and books, records, documents, etc.].

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

The primary legislation that must be considered with regard to heritage resources is the NHRA. The sections of this act are applicable to the NFS UCG are discussed below.

### 2.5.3.1 Section 2 – Definition of heritage resources

Section 2 of the NHRA contains definitions of certain terms used in heritage resources management. In terms of this proposal the following definitions must be considered:

- (ii) **archaeological**: any material remains resulting from human activity older than 100 years; any form of rock art older than 100 years and the area within 10 m of the art; and any feature, structure or artefact associated with military history older than 75 years as well the sites on which they are found;
- (v) **cultural significance**: aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance;



- (viii) **development**: any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including construction, alteration, demolition, removal or change of use of a place or a structure at a place; carrying out any works on or over or under a place; subdivision or consolidation of land comprising, a place, including the structures or airspace of a place; constructing or putting up for display signs or hoardings; any change to the natural or existing condition or topography of land; and any removal or destruction of trees, or removal of vegetation or topsoil;
- (xiii) **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;
- (xvi) **heritage resource**: any place or object of cultural significance;
- (xxi) **living heritage**: intangible aspects of inherited culture, and may include cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships;
- (xxxix) **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 trances;
- (xxxviii) **public monuments and memorials**: all monuments and memorials erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual;
- (xiii) **site**: any area of land, including land covered by water, and including any structures or objects thereon;
- (xiv) **structure**: any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith; and
- (xviii) **victims of conflict**: certain persons who died in any area now included in the Republic as a direct result of any war or conflict as specified in the regulations, but excluding victims of conflict covered by the Commonwealth War Graves Act, 1992 (Act No. 8 of 1992); members of the forces of Great Britain and the former British Empire who died in active service in any area now included in the Republic prior to 4 August 1914; persons who, during the Anglo-Boer War (1899-1902) were removed as prisoners of war from any place now included in the Republic to any place outside South Africa and who died there; and certain categories of persons who died in the

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“liberation struggle” as defined in the regulations, and in areas included in the Republic as well as outside the Republic.

#### **2.5.3.2 Section 34 – Structures older than 60 years**

Section 34 of the NRHA provides for general protection of structures older than 60 years. Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant Provincial Resources Heritage Authority (PHRA). These permits will not be granted without a HIA being completed.

A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the PHRA according to Section 34(2) of the NHRA.

#### **2.5.3.3 Section 35 – Archaeological and palaeontological resources and meteorites**

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3) specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by SAHRA destroy, excavate, or make any alterations to archaeological or palaeontological resources encapsulated in Section 38(4).

#### **2.5.3.4 Section 36 – Burial grounds and graves**

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the responsible heritage resources authority and the South African Police Service (SAPS). Furthermore, as specified in Section 38(3) no person may destroy, damage, exhume or alter any burial site without a permit issued by SAHRA.

#### **2.5.3.5 Section 37 – Public monuments and memorials**

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

#### **2.5.3.6 Section 38 - Heritage Resources Management**

##### **Section 38(1) and (2) – Heritage Impact Assessments independent of NEMA/MPRDA processes**

Section 38(1) stipulates that the relevant heritage authority must be notified of any development at the earliest opportunity possible, via a Notice of Intent to Develop (NID). The heritage authority is required to comment on the NID within 14 days stating whether a HIA is required or not. A Heritage Statement – which is the equivalent of a baseline – should be compiled to inform the NID.

The following activities, as stipulated in Section 38(1) of the NHRA, act as triggers for the undertaking of HIAs:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site -
  - (i) exceeding 5 000 m<sup>2</sup> in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority,
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

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

### **Section 38(8) – Heritage impact assessment required by NEMA/MPRDA processes**

HIAs are in general required in terms of subsection (8) where development is undertaken in terms of both NEMA and the MPRDA. In the event that a HIA is required in terms of subsection (8), subsection (3) requires the responsible HRA to specify information that must be provided in the HIA report.

The Listed Activities in terms of NEMA for which Environmental Authorisation will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

Activity	NHRA Trigger	Description
<b>Basic Assessment</b>		
GNR 544-21	38(1)(a)	Construction of a road longer than 300 m
GNR 544-23 i	38(1)(c)(i)	Transformation of land in excess of 5 ha that will change the character of a site
	38(1)(d)	Rezoning of land in excess of 10 ha
GNR 544-23 ii	38(1)(c)(i)	Transformation of land in excess of 5 ha that will change the character of a site

Activity	NHRA Trigger	Description
<b>Basic Assessment</b>		
	38(1)(c)(ii)	Transformation of land involving three or more existing erven or divisions
	38(1)(d)	Rezoning of land in excess of 10 ha
<b>Scoping and Full EIA</b>		
GNR 545-4 GNR 545-5	38(1)(a)	Construction of a road longer than 300 m
	38(1)(c)(i)	Transformation of land in excess of 5 ha that will change the character of a site
	38(1)(c)(ii)	Transformation of land involving three or more existing erven or divisions
	38(1)(d)	Rezoning of land in excess of 10 ha

### 3 METHODOLOGY

The Digby Wells HRM process is a phased approach aimed at integrating HRM into the NEMA and/or MPRDA processes, as well as expediting the HIA process required in terms of the NHRA. The process consists of three phases:

- Phase 1: Notification;
- Phase 2: HIA specialist studies; and
- Phase 3: Implementation of applicable heritage mitigation measures.

These phases integrate into the NEMA process as indicated in the following flow diagram. The methodology only addressed the first phase of the HRM process.

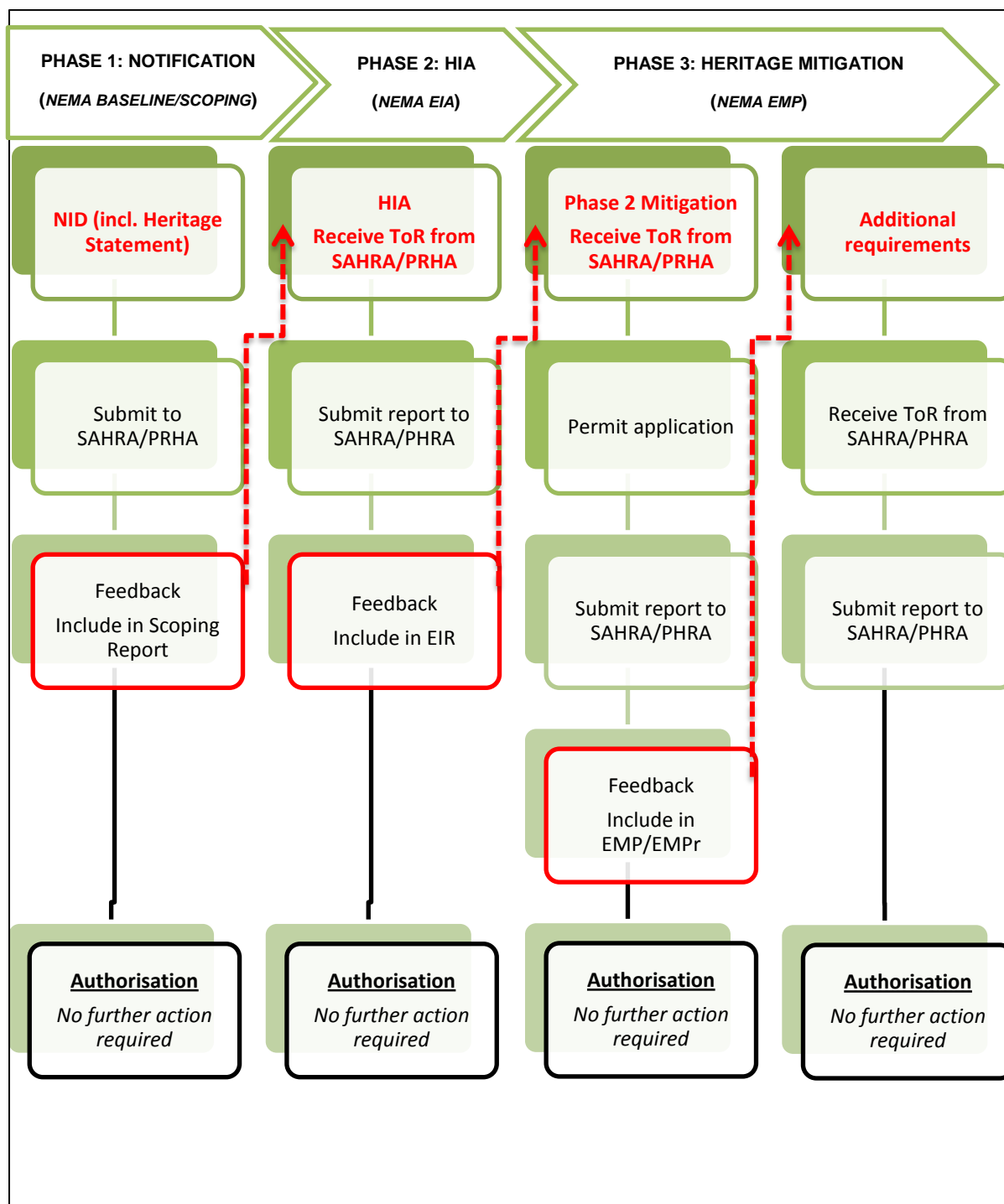


Figure 3-1: Integration of the HRM process into the MPRDA and NEMA processes

### **3.1 Heritage Statement**

The current heritage landscape of the Thabametsi Project area was characterised to include existing and potential heritage resources. The following methods were used in compiling the Heritage Statement:

#### **3.1.1 A Literature Review**

- A literature review of relevant and available published research such as academic journals and academic books;
- Archival and background research;
- A review of existing heritage impact assessment reports; and
- Review of relevant institutional frameworks such as Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).

#### **3.1.2 Historical Layering**

- A desktop-based survey of existing historical to current aerial photography to complement historical research and identify potential heritage resources;
- A desktop-based survey of historical to current topographical maps where relevant to determine the existence of potential heritage resources; and
- A desktop-based survey of historical to current geological maps where relevant to determine the potential existence of palaeontology resources.

#### **3.1.3 Site Naming**

##### **3.1.3.1 Previously identified sites**

Sites may be identified based on previous relevant reports. The site names and/or numbering that were used in the original reports will be used, but suffixed with the relevant SAHRA report number if available, for example a heritage resource identified in Pistorius 2008, described as a farm complex and numbered FC01.1 in that report will be:

- FC01.1/2008-SAHRA-0323

##### **3.1.3.2 Unconfirmed sites identified during desktop study**

Potential sites not previously identified, but noted as a result of historical layering, desktop studies or through indicators such as vegetation will be named using the Digby Wells project number and site number prefixed with HS and suffixed with a short description, for example EXX564/HS001-grave.

### 3.1.4 Identification and Evaluation of Potential Sources of Risk

Identification of possible sources of risk considered proposed project activities and infrastructure designs supplied by Exxaro for the Thabametsi Project, as well as development proposed in the LM-SDF, LM-IDP, and WD-IDP.

Evaluation of potential impacts on heritage resources that may result due to identified sources were based on professional experience, known existence of types or categories of heritage resources in and near the Thabametsi Project area.

## 4 CHARACTERISATION OF CULTURAL LANDSCAPE

### 4.1 Literature Review

The cultural landscape of the study area can be categorised by the occurrence of Later Iron Age such as Tswana type settlements, scatterings of Stone Age material (Middle and Later Stone Age) and later historical settlements, including the town of Lephalale and surrounding farming communities. Thus the project area and its surrounds can be characterised as a layered cultural landscape with a more predominant emphasis on more recent Later Iron Age and historical settlements.

#### 4.1.1 Geological Context

The geology of the study area is depicted on the 1:200 000 scale geological sheet (Plan 7). The study area is underlain by carbonaceous shales and coal of the Karoo Super Group. The coal deposits are preserved in the Waterberg Basin and it is believed that the Waterberg coalfield holds more than 40% of South Africa's *in situ* mineable coal reserves (Wilson, 2012). Currently, these coal reserves are being mined at Grootegeluk coal mine adjacent to the Thabametsi Project area.

The main Karoo Basin, which covers more than 50% of the surface of South Africa, can be subdivided into the Dwyka, Ecca and Beaufort Groups. The layers overlying the Beaufort Group can be subdivided into the Molteno, Elliot and Clarens Formations which are in turn overlain by the Drakensburg Basalts (Johnson et al., 1996).

In the northern part of the Limpopo Province, the Karoo Super Group is much attenuated and incomplete compared to the main Karoo Basin to the south (Durand, 2005). The bedrock of the study area is overlain by the Volksrust and Vryheid Formations of the Ecca Group (Exxaro, 2012). The Volksrust formation consists of intercalated shale and bright coal and the Vryheid Formation consists of sandstone and grit intercalated carbonaceous shale, siltstone and a few thick coal seams (WRC, 2001). The coal bearing strata of the Volksrust and Vryheid Formations in the Waterberg are considered to have originated in a fluvial environment and are of late Palaeozoic to early Mesozoic age (Exxaro, 2012). The Volksrust and Vryheid Formations of the Ecca Group are overlain by Clarens, Elliot and Molteno Formations of the Beaufort Group (Exxaro, 2012).

The farm Vaalpensloop 313 LQ is situated in the central part of the Waterberg coalfield in the Limpopo Province. The Waterberg coalfield strikes approximately ±88 km east-west and ± 40 km north-south in South Africa but extends westwards into Botswana. No outcrops of the coal bearing Karoo strata, comprising of the Volksrust and Vryheid Formations, occur in this area. Most of the Clarens, Elliot, Molteno and Beaufort Formations are weathered away. Due to geological structure and subsequent weathering the entire Volksrust Formation is not present on all the farms within the mine and prospecting rights areas (Exxaro, 2012).

An extensive sand cover, derived from the Karoo and Waterberg sandstones overlies the Karoo and older rocks, while other recent deposits such as surface limestone (calcrete) and fericrete are also present (Exxaro, 2012).

The stratigraphy of the Karoo Sequence in the Thabametsi Project area is represented in Table 4-1 below.

**Table 4-1: The stratigraphy of the Karoo sequence in the Thabametsi Project area**

<b>Phanerozoic</b>	<b>Palaeozoic</b>	250 million years	<i>Clarens Formation</i>
			<i>Vryheid Formation</i>
			Volksrust Formation
			<b>Ecca Formation</b>
			<b>KAROO SUPERGROUP</b>

#### 4.1.2 Palaeontological Heritage

Although no published records of site locations of fossils in the study area exist, certain geological strata that occur in the study area are known to be fossiliferous. The available literature consulted spans a wide geographic range from the Mpumalanga Province to the Limpopo Province. The results show that the Karoo strata of the Limpopo Province have the potential to contain fossils.

##### 4.1.2.1 Volksrust Formation

The Volksrust Formation consists of grey to black shale with siltstone or sandstones beds. Thin phosphate and carbonate beds and concretions are also common (WRC, 2001). In Empangeni (KwaZulu-Natal) there are deposits of the Volksrust Formation with Ecca plant fossils (Bamford, 2011). Although these deposits lie 700 km away from the project area, it may be possible for plant fossils to exist within the Volksrust Formation in Limpopo.

##### 4.1.2.2 Vryheid Formation

In the Mpumalanga Province, around Ermelo, there are exposures of Permian rocks of the Vryheid Formation which contains fossil plants of the *Glossopteris* flora but no vertebrates (Bamford, 2011).

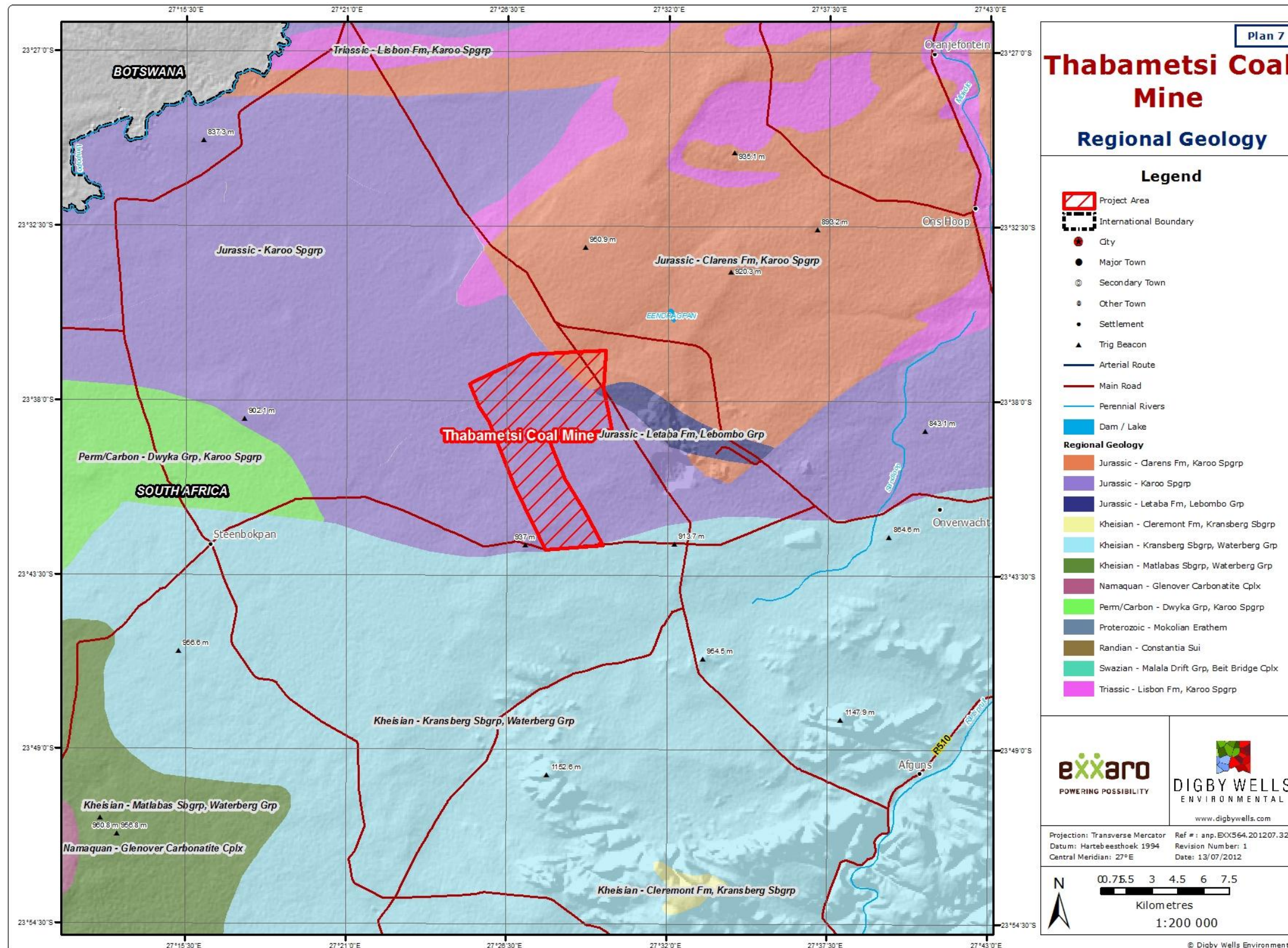


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#### 4.1.2.3 Clarens Formation

The prosauropod dinosaur *Massospondylus* was discovered in the Clarens Formation in the Kruger National Park, the Vhembe Reserve to the north of the Thabametsi Project area and on the Sentinel Ranch in southern Zimbabwe (Durand, 2005). The unique palaeosurface in the Clarens Formation sediments on the Limpopo River at Pontdrift contains the trackways of dinosaurs and possible the earliest record of the existence of snakes (Van Eeden & Keyser, 1971; Durand, 2005).

From these studies it can be concluded that fossils could be found in the Clarens Formation strata in the north-western areas of the Limpopo Province. However, within the Thabametsi Project area, most of the Clarens Formation is weathered away and therefore any fossils that may have been present in the past would have been eroded and weathered as well.



Plan 7: Geology of the Thabametsi Project area

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### 4.1.3 Stone Age

South Africa has been inhabited by tool producing hominins for at least two million years. Much of the evidence for the presence of hominin activity is derived from stone tools. These tools are not only indicative of their presence in the landscape, but also attest to the technological developments of our genus. Varying factors, including geology, geomorphology, climate, fauna and flora have resulted in a complex record of social and technological changes through time.

Classification of these tools is done on three levels, namely:

- Form;
- Function; and
- Technique.

Based on the criteria for classification, it is evident that the initial model<sup>1</sup> of Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) (*with variants*) developed by Goodwin and Van Riet Lowe (1929) is appropriate. Having stated this, the last formal summary of the southern African Stone Age Sequence prior to Lombard et al. (2012) was conducted in 1984.

The approach adopted by Lombard et al. (2012) is to acknowledge that archaeological assemblages are not exact replicas of one another even though they may overlap economically, chronologically and/or regionally. The classification is based on *technocomplexes*, also known as industrial complexes, defined as assemblages that share a polythetic range (a context or a class of things having many but not all properties in common). Through time, changes in an industry may be expressed as phases, whereas regional variations (spread less widely than a technocomplex but found at several sites) may be expressed as distinct industries in a technocomplex where there is a high level of similarity in design, but not necessarily frequency, of artefact types (Lombard et al., 2012).

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<sup>1</sup> This model has been reassessed and modified through time **Invalid source specified..**

**Table 4-2: The South African and Lesotho Stone Age Sequence (after Lombard et al., 2012)**

Period	Technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	ceramic final LSA <2 ka	Ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	final LSA 0.1-4 ka	Post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4-8 ka	Holocene microlithic
	Oakhurst 7-1 ka	Terminal Pleistocene / early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	Robberg 12-18 ka	Late Pleistocene microlithic
	early LSA 18-40 ka	(informal designation) Late Pleistocene microlithic
Middle Stone Age >20 ka - <300 ka	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
early MSA 130-300 ka	(informal designation)	



Period	Technocomplex	Also known as (including regional variants)
Early Stone Age >200 ka	ESA-MSA transition >200-600 ka	(informal designation) (Fauresmith, Sangoan)
	Acheulean 300-1.5 Ma	
	Oldowan 1.5-2 Ma	

#### 4.1.4 Iron Age

Within the study area, two significant migrations have taken place through the Iron Age. The two migrations represent different branches of the general southerly Bantu migration. The first migration forms part of the initial stages of the Early Iron Age Happy Rest sub-branch, while the second later migration through the area is from the Moloko sub-branch.

The earliest facies in the Moloko Branch is Icon dating to 1300 – 1500 CE. During this period Icon interacted with people using other ceramic facies, either incorporating elements as they did with Eiland, or merging with another facies, as is with the example where it merged with the *Khami* facies to develop into *Tavhatshena* facies. Around 1500 CE two different facies derived from Icon become visible in the archaeological record marking the second phase in the Moloko Branch, predating the stonewalling ascribed to Sotho-Tswana speakers. The *Letsibogo* facies has been recorded in the Motloutswa drainage in Botswana and in the Blouberg in the Limpopo Province. Research on the oral traditions of the Tswana indicates that this ceramic facies is linked to the Bakaa tribe who were located at the Shoshong Hills until 1849 CE (Biemond, 2011) when they were overpowered. The *Madikwe* facies has been recorded from the Makapans Valley area west into Botswana. Stylistically these facies differ in terms of the decoration technique employed. *Letsibogo* emphasises punctates as opposed to stabs and fingernail impressions in *Madikwe*. These two facies form part of the Moloko Sequence, and are intermediate phases between the parent facies, *Icon*, and the later historical ceramic types, such as *Buispoort*, which later became associated with the western Sotho Tswana identity (Huffman, 2007).

The history of the Sotho-Tswana is a complex time line with many various factions and migrations within Limpopo, the North-West and Botswana and to some extent the Free State. Over the years, there have been attempts to fill in the gaps regarding the movements of the Sotho-Tswana and their settlements, and there have been many theories as to their history (Breutz, 1938; Van Warmelo, 1962; Legassick, 1969; Parsons, 1973; Van Warmelo, 1974; Schapera, 1980; Pistorius, 1995a; Sekgarametso, 2001; Hall et al., 2008; Biemond, 2011).

The Bakwena, who originate from the Baphotu Kingdom, were a group that were associated with the Sotho-Tswana. They appeared around 1000 to 1500 CE and experienced a great deal of political instability. A son of Tebele and leader of the Bakwena, Mōgōpa, broke away from the Bakwena and settled at Mabyananmatswana (Swartkoppies, near Brits). Mabyananmatswana was occupied in phases ranging from 1663 – 1911 CE (Pistorius, 1995b). There were a number of periods of serious drought and famine which caused Mōgōpa's people to scatter off into many directions searching for food. It is proposed that this site is the centre from which the major Sotho-Tswana groups (Hurutshe, Kwena and Kgatla) scattered.

According to Parsons (1973) the Kgatla moved north-east from the Marcio-Crocodile confluence area. Recent research has placed the Kgatla origin to be in the vicinity of Rustenburg with links to *Buispoort* and *Madikwe* ceramic facies. Other areas that can be

associated with the Kgatla include that of Tskeane near Rooiberg and Leeuwpoort in the southern Waterberg (Hall et al., 2008). The Kwena of Mōgōpa stayed at Mabyananmatswana but eventually moved to Rathateng at the confluence of the Marcio and Crocodile Rivers. Mōgōpa's son, Kgabo split from his father's group and settled at Dithejwane Hill in Botswana where they met San hunter-gatherers and the Bakgalagadi (Bangologa) and created a co-operative relationship with them whilst participating in the trans-Kgalagadi trade. The baKwena багаKgabo flourished through this trade, gaining prestige by owning large amount of cattle and sheep (Sekgarametso, 2001). Some Bakgalagadi joined the Bakaa in the north around the Shoshong Hills and paid them tribute. The Bakaa can be linked with *Letsibogo* type ceramics and they held the landscape as their own chiefdom during the 16<sup>th</sup> century to 1849 CE taking over the Shoshong Hills from the Kalanga (Parsons & Robinson, 2004; Biemond, 2011).

The Bakgalagadi settlements included cattle posts that are located at some distance from the villages, sometimes up to 60 km. They consist of fenced compounds with large thatched houses with pole-and-daga rectangular walls (3 x 4 m and 1.5 m high). The defining features of the compounds are the kraals for the cattle and small livestock, which are usually located approximately 100 m away from the compound. A midden can be expected near the compound and a borehole is sometimes evident. These settlements are seasonally occupied following the rain for grazing lands and are abandoned for many reasons, of which include lightning or frequent deaths of the livestock (Breutz, 1938; Lepekoane, 1994).

At the time that the Bakwena began to flourish, the Ngwato and Ngwaketse were distinguishing themselves from the Kwena by setting up their own villages but still considering themselves as part of the Kwena tribe. A theory exists that the Ngwato were an ancient section of the Kwena, as they had their own cattle posts in the Shoshong Hills before they migrated there after they split from the Kwena (Parsons & Robinson, 2004).

After the separation of these groups, the dominant political groups were then the Ngwaketse, a military state from around 1750 CE that controlled the Kalahari west of Kanye; the Kwena; and the Ngwato who were led by the Lesele- Khurutshe north to the Shoshong amongst the Kalanga under Mathiba (Parsons & Robinson, 2004).

Between 1824 and 1826, the Ngwato were attacked by the Ndebele causing them to take refuge in the Kutswe Hills where they were subsequently attacked by the Kololo causing them to flee north to the Kalanga. After Kgari was killed, the Ngwato moved back to Kutswe where relations with the Kwena became strained causing the groups to separate where the Kwena were joined by the Kaa and settled at Shoshong. Due to tensions with the Kololo, the group moved to Lophepe (Lephepe), directly west of the project area, where they were attacked by the Ndebele of Mzilikazi. This attack caused the group to scatter and they fled and were mostly seen in small mobile clans in a large territory. It is when these groups moved across the desert to Letlhakeng where they encountered Moruakgoma, and decided to unite the two sections of the Kwena (Parsons, 1973; Schapera, 1980).

This was a period when the Kwena were being attacked and raided by several groups, primarily the Sebetwane and Mzilikazi which ultimately resulted in the death of Tshosa and

Moruakgomo and the capture of Sechele by the Sebetwane. During this time, the Kwena divided once again, scattering Kwena groups. Groups under Kgama moved east and established themselves on the banks of the Marico River, and Segokotlo and his followers roamed around the Shoshong hills where they were defeated by the Kaa and moved south to Lophepe. Soon after, Segokotlo was assassinated and Molese became chief. On the news of the capture of Sechele, Ngwato chief Kgama II secured his release from the Sebetwane, and he settled with the Ngwato (Schapera, 1980).

Another group, the Seleka, who were Transvaal Nguni by origin, had their settlement around the White Mountain of Ngwapa near modern Martin's Drift. The Seleka are also said to have settled around Swaneng (now a suburb of Serowe) and built hilltop fortifications. The Seleka were known for their famous rain-makers. At Ngwapa the Seleka could exploit their position on the tsetse flybelt (which extended west at times as far as Old Palapye) for trading purposes between Botswana and the Transvaal moving their cattle at night to avoid the tsetse fly during the day (Parsons, 1973). Other Nguni type settlements include the defensive hill-top settlements of Melora Hill, Mabotse and Smelterskop (Hall et al., 2008). These settlements are associated with *Rooiberg-Uitkomst* type ceramics that were evident in the 17<sup>th</sup> century that spread out of the Waterberg from the south due to the Fokeng and south-western Tswana interaction and merged with *Madikwe* type ceramics.

#### **4.1.5 Historical Settlements**

Very little historical settlement is evident in the surrounding areas, possibly due to the historic occurrence of tsetse fly in the 19<sup>th</sup> century, discouraging settlers from moving into the area (Plug, 2000). The town of Lephalale was established in 1960 and was originally called Ellisras after the two original farm owners Patric Ellis and Piet Erasmus who settled in the area in the 1930's (Lephalale Municipality - Limpopo Province, South Africa). The town was later renamed to Lephalale in 2002 after the river (Palale River) that runs through the municipality.

#### **4.1.6 Struggle History**

In a report submitted to the Truth and Reconciliation Commission (TRC) in 1997 (The ANC's second submission to the TRC, 1997), Lephalale (Ellisras at the time) was used as a base to launch political attacks into neighbouring states. In August 1984, a member of Umkhonto weSizwe was killed in Lephalale by the South African Police (List of MK Operations – The O'Malley Archives). In a case in the TRC [Truth and Reconciliation Commission v Jacob Mpsa Raphalo (AC/2000/081), Jacob Mpsa Raphalo applied for amnesty in respect of offences such as murder and attempted murder, as well as terrorism. In his testimony, he revealed that in 1988 he received orders from Chris Hanu to cross into South Africa from Botswana. He was selected as the commander of a unit of seven individuals who crossed the border near Lephalale (Ellisras) and camped near Beauty on the banks of the Palala River. On the morning of the 8 August 1988, they were found by a tracking unit of the SAP and they clashed. One member of the Unit, James Kgwatlha as well as Constable N C Claasen of the SAP was killed whilst Jacob and his deputy, Mike Makwena, as well as W J



van Rooyen of the SAP were wounded. Jacob and the other five members of the unit managed to escape during the following night and managed to cross the border back into Botswana. They left their weapons behind at the scene of the skirmish and were eventually arrested in Botswana and deported to Zambia.

## 4.2 Relevant Databases and Collections

The archival and database survey was conducted by consulting the following resources:

- Chief Surveyor General;
- National Automated Archival Information Retrieval System (NAARS);
- University of the Witwatersrand (WITS) Archaeology Site Database;
- Genealogical Society of South Africa;
- Council for Geoscience;
- Geological Society of South Africa; and
- South African Heritage Resources Information Systems (SAHRIS).

No information was available from the Chief Surveyor General database for the farm Vaalpensloop 313 LQ. The surrounding farms, Grootegeluk 469 LQ, Hieromtrent 460 LQ and Massenberg 305 LQ were all originally surveyed in 1908.

The NAARS archive data reveals a 'Grondbrief' (Deed) dating to 1960 for the farm Vaalpensloop 313 LQ to Mr JM Smith (URU-3998-383).

A total of 47 heritage sites have been recorded on the WITS Archaeological Sites Database for the 1:50 000 2327CB map. The sites include Stone Age sites, primarily from the Post Howiesons Poort of the MSA; Iron Age sites associated with Moloko facies; and historic sites associated with built structures and burial grounds and graves. Only one site within a 13 km distance from the Thabametsi Project area was identified from the WITS Archaeological Site Database. This site, known as Nelson's Kop, is discussed in the Literature Review in Section 4.1.3.

Based on a survey of the Genealogical Society of South Africa database, no registered monuments, burial grounds or graves occur within or in close proximity to the project area.

The Council for Geoscience and the Geological Society of South Africa databases were surveyed for all available publications and geological maps on the Waterberg regional geology. The results are discussed in the Literature Review in Section 4.1.1.

The SAHRIS database was consulted for all available and relevant previous impact assessment reports. The results are discussed in Section 4.4.

## 4.3 Desktop Cartographic Survey

A desktop cartographic survey was conducted in order to determine the potential of sites to exist within the project area as well as relative age of identified sites based on the dates of

the maps. Historical aerial photographs, historical maps, current topographic maps and satellite imagery were used to this end.

The Major Jackson Map of Zoutpan (June, 1902) was surveyed for potential heritage resources. No sites of heritage significance were recorded on the map for the farm Vaalpens 1088 (now Vaalpensloop 313 LQ) or its surrounding farms.

Historical aerial photographs from 1948 to 1990 were surveyed for potential built structures. Any built structures such as house or homestead, a residential complex, or industrial and mining buildings that were identified in these photographs would be older than 60 years and would therefore be considered historical structures in accordance with Section 38 of the NHRA.

The historical aerial photographs from 1948 to 1990 showed that landscape consisted mainly of unploughed fields with no industrial development occurring within the project boundaries. The photographs surveyed showed several potential heritage resources. These include:

- Homesteads;
- Fields;
- Roads; and
- Pans.

The historical aerial photograph from 1969 showed that three agricultural fields had been ploughed (648\_016\_00925). This photograph also showed a homestead adjacent to the field (EXX564-HS001-homestead). Heritage resources such as graves may be present in and around the fields and near the homestead.

Overall, the historical aerial photographs showed that little development in the form of homesteads, residential settlements, and industrial and mining buildings occurred within the project area. Regardless of this observation, with the lack of visual clarity of the historical aerial photographs it may have been possible for additional historical homesteads and residential settlements to go unnoticed during the cartographic survey.

The 1984 topographical map of 2327CB Steenbokpan was surveyed for potential heritage resources. The map showed that most of the area is covered in trees and bush with agricultural fields covering a small portion of the farm. No additional heritage resources were found.

A survey of satellite imagery revealed the presence of at least four built structures on the Vaalpensloop 313 LQ farm. Two of these are most likely the historical homestead identified in the historical aerial photographs from 1969. The remaining two built structures are comprised of a house and a reservoir. No other built structures could be identified.

#### **4.4 Relevant Previous Impact Assessment Reports**

The following relevant previous impact assessment reports were surveyed:

- Roodt, F. 2001. Archaeological Impact Assessment: Proposed Heavy Industrial Area on Portion 5 of the Farm Grootestryd 465 LQ, Ellisras. R&R Cultural Resource Consultants: Unpublished report.
  - Archaeological finds were limited to three identified MSA scatters. No *in situ* material was found due to the disturbed nature of the project area (Roodt, 2001).
- Van Schalkwyk, J.A. 2005. Heritage Impact Scoping Report for the Proposed New Matimba B Power Station, Lephalale District, Limpopo Province. National Cultural History Museum: Unpublished report.
  - The report identified four heritage resources surrounding the project area. These include burial grounds and graves, Iron Age ceramics, and an engraving site at Nelson's Kop (Van Schalkwyk, 2005).
- Van Schalkwyk, J.A. 2006. Environmental Scoping Report for the Proposed Establishment of a New Coal-Fired Power Station in the Lephalale Area, Limpopo Province. National Cultural History Museum: Unpublished Report.
  - The report serves as the heritage component in the larger scoping assessment. Additionally, the recorded heritage resources are those that are recorded in the assessment for the Matimba B Power Station discussed above. These include the burial grounds and graves, Iron Age ceramics, and the engraving site at Nelson's Kop (Van Schalkwyk, 2006).
- Pistorius, J. 2007. A Phase 1 Heritage Impact Assessment (HIA) Study for Eskom's Proposed New 400kV Power Line Route between the Matimba B Power Station and the Marang Substation near Rustenburg. Dr JCC Pistorius Archaeology & Heritage Management Consultant: Unpublished report.
  - The report covered a large area from south to north. The assessment of the heritage resources in the north was consulted. Heritage resources span from the Stone Age through to the historical period. The presence of Nelson's Kop, a small protrusion in a relatively flat landscape with identified engravings to the east of the project area, was noted. Geographical locations of identified heritage resources were not included in the report and therefore these resources are not included in this assessment (Pistorius, 2007).
- Pistorius, J. 2010. A Phase 1 Heritage Impact Assessment Study for Exxaro's Proposed New Thaba Metsi Open Cast Coal Mine near Lephalale in the Limpopo Province of South Africa. Unpublished Report prepared by Dr JCC Pistorius Archaeology & Heritage Management Consultant.
  - Identified heritage resources include Stone Age tool scatters, a historical homestead and formal and informal burial grounds with some historical significance. The identified stone tool scatter, historical house and GY02 and GY03 were to be affected by the Thaba Metsi Project (Table 4-4)

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- Recommended mitigation measures for the heritage resources included no mitigation for the stone tool scatter; a Built Environment Assessment of the house and an application for a destruction permit from SAHRA; and the relocation of burial grounds as per the various laws, regulations and administrative procedure (Pistorius, 2010).
  - Nel, J. 2012. Phase 2 Archaeological Impact Assessment Mitigation for Boikarabelo Coal Mine (SAHRA Permit no: 80/11/07/015/51). Unpublished Report by Digby Wells Environmental.
    - The report details the mitigation measures carried out on sites identified during an initial Phase 1 assessment of the project area. During the Phase 1 assessment, a total of 26 heritage sites were identified. These sites spanned from the Stone Age through to the historical period. An additional two sites were identified during the Phase 2 mitigation.
    - Identified stone tools include scatters dating to the MSA, as well as a single handaxe from the ESA.
    - Of the identified sites, a total of 12 were recommended for Shovel Test Pit (STP) testing and three for excavation. A permit for these mitigations was issued by SAHRA (SAHRA Permit No 80/11/105/51). The results from the surface collections, excavation and STP's suggest that the area was occupied by Letsibogo *facies* users and later by historic Sotho-Tswana (Nel, 2012).

**Table 4-3: Potential heritage resources within the project area identified from a cartographic survey**

Site No.	Map No.	Source	Latitude	Longitude
EXX564-HS001-homestead	2327CB	648_016_00925	-23.6862	27.4738
EXX564-HS002-homestead	2327CB	498-198_004_00119	-23.6871	27.4741
EXX465-HS003-homestead	2327CB	Aerial satellite survey	-23.6903	27.4763
EXX564-HS004-resevoir	2327CB	Aerial satellite survey	-23.7013	27.4807

**Table 4-4: Heritage resources within the project area identified from a previous impact assessment report by Pistorius (2010)**

Site No.	Map No.	Source	Latitude	Longitude	Farm Name	Description
N/A	2327CB	Pistorius, 2010	-23.6513	27.4781	Border of McCabesvley 311 LQ and Leeuport 312 LQ	Scatter of stone lithics
Historical House 1	2327CB	Pistorius, 2010	-	-	Graaffwater 456 LQ	Historical House
Grave 01	2327CB	Pistorius, 2010	-23.6875	27.5453	Turflaagte 463 LQ	Single grave
Grave 02	2327CB	Pistorius, 2010	-23.6679	27.4729	Jackhalsvley 309 LQ	Single grave
Grave 03	2327CB	Pistorius, 2010	-23.6183	27.4834	Graafwater 56 LQ	Single grave
Grave 04	2327CB	Pistorius, 2010	-23.6045	27.4936	Onbelyk 257 LQ	Single grave

## 5 POTENTIAL IMPACT AND SOURCES OF THREATS OR RISK

Within the footprint area on farm Vaalpensloop 313 LQ, activities performed in preparation of mining such as clearance of vegetation and the construction of supporting infrastructure, may result in surface disturbances of sites of archaeological and heritage significance. With regards to heritage resources within the Thabametsi Project area, the potential impacts include:

- May cause alteration, damage to or destruction of archaeological and/or palaeontological sites, more specifically sites with regards to subsurface archaeological resources;
- May cause alteration, damage to or destruction of historical buildings and structures older than 60 years; and
- May cause alteration, damage to or destruction of burial sites and cemeteries.

The LM-SDF, LM-IDP and WD-IDP were reviewed to gain a more detailed understanding of the development context within which the Thabametsi Project area is situated.

The SDF and IDPs identified the mining and tourism sectors as key areas for development and growth of the municipality. Although these reports do not make references to heritage resources, there is a general aim to increase tourism-based business and game reserves.

The mining sector that has been identified as a key area for growth and development comprises specific types or categories of development that may impact on heritage resources in various manners. These may include increased prospecting activities and the construction of power plants and coal mines. The proposed development relative to the Thabametsi Project must therefore be taken into account when evaluating the impact on potential heritage resources.

## 6 RECOMMENDATIONS AND CONCLUSION

### 6.1 Recommendations

There is a low probability of terrestrial fossil bones being turned up in excavations into *in situ* deposits. With depth, it is possible that fossil plant and wood material, and peat layers, could be found. It is important to obtain samples of this material. ESA and MSA artefacts may be found in scatters across the project area as well as buried in the upper part of excavations.

A previous impact assessment on the project area showed that burial grounds and graves exist near homesteads and in fields. It may therefore be possible for burial grounds and graves to exist in fields and around homesteads within the farm Vaalpensloop 313 LQ.

The homesteads identified from the historical aerial photographs on Vaalpensloop 313 LQ are potentially older than 60 years and therefore constitute heritage resources in terms of the NHRA.



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Based on the above it is recommended that a Heritage Impact Assessment (HIA) be undertaken for the Vaalpensloop 313 LQ Portion 1 and Remaining Extent. It is recommended that the HIA should consist of an Archaeological Impact Assessment (AIA), a Built Environment Assessment of the Historical Townscape; and a focussed Burial Grounds and Graves Survey.

A letter of Recommendation of a Palaeontological Impact Assessment (PIA) be requested from SAHRA provided that a Fossil Chance Find Procedure be implemented (Appendix B).

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## 6.2 Conclusion

A previous Phase 1 HIA for the requirements of an EIA that was to be completed for the proposed main Thabametsi opencast pit in 2009 was prepared by Dr Julius Pistorius (2010) for Golder Associates Africa (Pty) Ltd. This HIA did not include the new developments and the farm Vaalpensloop 313 LQ and it is now necessary to compile a Heritage Statement that will incorporate any new findings into the original heritage assessment.

The current heritage landscape of the Thabametsi Project area was characterised to include existing and potential heritage resources. This was done by reviewing all available and relevant published research and previous heritage impact assessment reports and by conducting archival and background research.

A cartographic survey of existing historical to current aerial photography, historical to current topographical maps historical to current geological maps was conducted to complement historical and geological research and identify potential heritage resources.

### SUMMARY OF FINDINGS

During the cartographic survey and historical layering process, a total of four potential heritage resources were identified. These comprised of three homesteads and an old reservoir. In addition, two fields were identified in the historical aerial photographs. Based on the previous impact assessment by Pistorius (2010), who identified four graves on in the greater Thabametsi Project area, there is a high probability for burial grounds and graves to exist in and around fields and near homesteads on Vaalpensloop 313 LQ.

Pistorius (2010) also identified a historical house and Stone Age scatters in the wider Thabametsi Project area. There is a chance that Stone Age scatters also exist on Vaalpensloop 313 LQ.

A desktop survey of the Council of Geoscience database and of relevant published scientific literature indicates that the geologic strata underlying the project area belongs to the Volksrust and Vryheid Formations of the Ecca Group, Karoo Supergroup.

Although no published records of site locations of fossils in the study area exist, certain geological strata that occur in the study area are known to be fossiliferous. The available literature consulted spans a wide geographic range from the Mpumalanga Province to the Limpopo Province. The results show that the Karoo strata of the Limpopo Province have the potential to contain fossils.

### RECOMMENDATIONS

There is a low probability of terrestrial fossil bones being turned up in excavations into *in situ* deposits. With depth, it is possible that fossil plant and wood material, and peat layers, could be found. It is important to obtain samples of this material. ESA and MSA artefacts may be found in scatters across the project area as well as buried in the upper part of excavations.

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A previous impact assessment on the project area showed that burial grounds and graves exist near homesteads and in fields. It may therefore be possible for burial grounds and graves to exist in fields and around homesteads within the farm Vaalpensloop 313 LQ.

This report constitutes a Heritage Statement for the farm Vaalpensloop 313 LQ of the proposed Thabametsi Project. This Heritage Statement will be included in the Draft EIA Report to be submitted in accordance with the MPRDA. The HIA will integrate the findings of the previous HIA conducted by Pistorius (2010) with the findings of the HIA conducted on Vaalpensloop 313 LQ. This HIA will then be included in the Final EIA Report for both the MPRDA and NEMA processes.

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## 7.2 Databases

Chief Surveyor General

National Automated Archival Information Retrieval System (NAARS)

University of the Witwatersrand (WITS) Archaeology Site Database

Genealogical Society of South Africa

Council for Geoscience

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Geological Society of South Africa

South African Heritage Resources Information Systems (SAHRIS)

### **7.3 Legislation**

South Africa. 1998. National Environmental Management Act, No. 107. *Government Gazette* 19519. Pretoria: Government Printer.

South Africa. 1999. National Heritage Resources Act, No. 25. *Government Gazette* 19974. Pretoria: Government Printer.

South Africa. 2002. Mineral and Petroleum Resources Development Act, No. 28. *Government Gazette* 23922. Pretoria: Government Printer.

South African Heritage Resources Agency (SAHRA) Minimum Standards

Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics

## **Appendix A: Curriculum Vitae**





DIGBY WELLS  
ENVIRONMENTAL

## SHAHZAADEE KARODIA

Ms Shahzaadee Karodia  
Archaeology Consultant  
Social Science Department  
Digby Wells Environmental

### 1 EDUCATION

- 2006 BA Anthropology & Archaeology, University of the Witwatersrand
- 2007 BSc Honours. Palaeontology, University of the Witwatersrand
- 2012 MSc Archaeology, University of the Witwatersrand

### 2 LANGUAGE SKILLS

English (read, write, speak)

### 3 EMPLOYMENT

2012:	Archaeology consultant, Digby Wells Environmental
April 2012 – June 2012:	Archaeology consultant, EcoAfrica
April 2011 – November 2011:	Archaeology intern, University of Pretoria
2009 – 2011:	English tutor, Kip McGrath
2009 – 2011:	Online English tutor, Education First
2008 – 2009	English teacher, Yong Ju Elementary School
2007 – 2008:	Palaeontology collections assistant, BPI University of the Witwatersrand
2006 – 2007:	Tour guide, Sterkfontein Caves

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Directors: AR Wilke, LF Koeslag, PD Tanner (British)\*, AJ Reynolds (Chairman) (British)\*, J Leaver\*, GE Trusler (C.E.O)  
\*Non-Executive



## 4 EXPERIENCE

- Archaeology Field School in Klipriviersberg with Dr Karim Sadr, University of the Witwatersrand
- Archaeology Field School in Swartkrans and Maropeng with Dr Kathy Kuman, University of the Witwatersrand
- Archaeology Field School in Ottosdaal with Dr Thembi Russell, University of the Witwatersrand
- Palaeontology Field School in the Karoo with Professor Bruce Rubidge, University of the Witwatersrand
- Palaeontology Field School in Gladysvale with Professor Lee Berger, University of the Witwatersrand
- Palaeontology Field School in Wonderkrater with Dr Lucinda Backwell, University of the Witwatersrand

## 5 PROJECT EXPERIENCE

- Heritage Statement for the Central Basin, Witwatersrand Acid Mine Drainage Project
- Archaeological Watching Brief on Access Road for Bokoni Platinum Ltd
- Heritage Statement for Eskom Transmission Division – Roodepoort Strengthening Project;
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga
- Heritage Statement for Rhodium Reef Limited Platinum Operation, 2430 CA & CC, De Goedverwachting 332 KT, Boschloof 331 KT and Belvedere 362 KT

## 6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA)
- The Palaeontological Society of Southern Africa (PSSA)
- The South African Archaeology Society (SAAS)
- Society of Africanist Archaeologists (SAfA)
- The South African Society for Amateur Palaeontologists (SASAP)



DIGBY WELLS  
ENVIRONMENTAL

## NATASHA HIGGITT

Ms Natasha Higgitt  
Archaeology Consultant  
Social Department  
Digby Wells Environmental

### 1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2009)
- 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: Archaeology 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 EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape

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\*Non-Executive

- 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

- 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: Member



DIGBY WELLS  
ENVIRONMENTAL

## JUSTIN DU PIESANIE

Mr Justin du Piesanie  
Archaeology Consultant  
Social Sciences Department  
Digby Wells Environmental

### 1 EDUCATION

University of the Witwatersrand

- BA Degree (2004)
- BA Honours Degree (2005) - Archaeology
  - Title of Dissertation - Seal Skeletal Distribution of Herder and Forager Sites at Kasteelberg, Western Cape Province of South Africa.
- Master of Science (MSc) Degree (2008) – Archaeology
  - Title of Dissertation – Understanding the Socio-Political Complexity of Leokwe Society during the Middle Iron Age in the Shashe-Limpopo Basin through a Landscape Approach

### 2 COURSES

- Introduction into ArcGIS. GIMS Ltd, Midrand. Received Certificate (2006)
- French Institute of South Africa (IFAS) GIS Workshop, University of the Witwatersrand. Received Certificate (2010)

### 3 CONFERENCES

- ASAPA, University of Botswana, Gabarone, Botswana (2005).
- Mupungubwe Symposium, University of Pretoria, Pretoria, South Africa (2006) - Presented paper titled, “Social Complexity in the Shashe Limpopo Basin: The Case of K2 and Leokwe”
- ASAPA, University of Cape Town, Cape Town, South Africa (2008).
- SAfA, University of Frankfurt, Frankfurt, Germany (2008) - Presented paper titled, “Social Complexity in the Shashe Limpopo Basin: Conclusions”

## 4 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

## 5 EMPLOYMENT

Present:	Archaeology Consultant at Digby Wells Environmental
2009 to 2011:	Archaeology Collections Manager at the University of the Witwatersrand.
2009 to 2011:	Freelance Archaeologist for Archaeology Resource Management (ARM), Matakoma Heritage Consultants, Wits Heritage Contracts Unit & Umlando Heritage Consultants.
2006 to 2007:	Tour Guide at Sterkfontein Caves World Heritage Site.

## 6 PROJECT EXPERIENCE

- 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

### **Cultural Resource Management (CRM) Work**

- Phase 2 Mitigation at Meyersdal, Klipriviersberg Johannesburg (ARM)
- Phase 1 Mitigation – Mapping of Late Iron Age Site in Pilansberg, Sun City (ARM)
- Phase 1 Mitigation – Survey of Witbank dam development (ARM)
- Phase 1 Mitigation – Survey of Glen Austin AH, Johannesburg (Matakoma)

- Phase 1 Mitigation – Survey of Modderfontein AH Holding 34, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 38, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 44, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 46, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 47, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 48, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 49, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 50, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 61, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 62, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 71, Johannesburg (Matakoma).
- Phase 1 Mitigation – Survey of Modderfontein AH Holding 72, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Modderfontein 35IR Portion 40, Johannesburg (Matakoma)
- Phase 1 Mitigation – Survey of Rhino Mines, Thabazimbi Limpopo Province (ARM)
- Phase 1 Mitigation – Survey of Moddergat 389KQ, Schilpadnest 385KQ, Swartkop 369KQ, Cronimet Project, Thabazimbi Limpopo Province (Matakoma)
- Desktop Study – Desktop study for the Eskom Thohoyandou SEA Project, Limpopo Province (Matakoma)
- Phase 2 Mitigation – Excavation of Iron Age site on Wenzelrust, Shoshanguve Gauteng (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of Late Stone Age shelter, Parys, Free State
- Phase 1 Mitigation – Survey of Vaalkrans Battlefield for the Transnet NMPP Line (Umlando)
- Phase 1 Mitigation – Survey of Portion 222 of Mindale Ext 7 Witpoortjie 254 IQ & Portion 14 of Nooitgedacht 534 IQ, Johannesburg (ARM)
- Phase 2 Mitigation – Excavation of Site 19 for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Phase 1 Mitigation – Mapping of sites 23, 26, 27, 28a & b for the Anglo Platinum Mines Der Brochen & Booyensdal, Steelpoort, Mpumalanga (Heritage Contracts Unit)
- Desktop Study - Desktop study for the inclusion into the Thohoyandou Electricity Master Network for Eskom, Limpopo Province (Strategic Environmental Focus)
- Phase 1 Mitigation – Mapping of historical sites as part of the mitigation for the expansion of the Bathlako Mine's impact area (Heritage Contracts Unit).
- Phase 2 Mitigation – Grave Relocation Project (GRP) for the Kibali Gold Project, Democratic Republic of Congo (Digby Wells)
- Phase 1 Mitigation – Survey for the proposed Kibali Hydro Power Stations, Democratic Republic of Congo (Digby Wells)



- Phase 1 Mitigation – Survey of the farm Vygenhoek for Sylvania Resources Everest North Mining Project, Steelpoort, Mpumalanga (Digby Wells)
- Phase 1 Mitigation – Burial Grounds and Graves Survey (BGGs) for Platreef Resources, Mokopane, Limpopo Province (Digby Wells)
- Phase 2 Mitigation – Archaeological Impact Assessment of sites for Resource Generation Boikarabelo Mine, Steenbokpan, Limpopo Province (Digby Wells)

## **7 PROFESSIONAL AFFILIATIONS**

Association of Southern African Professional Archaeologists (ASAPA): Professional & CRM Member

Society for Africanist Archaeologists (SAfA) Member

**JOHAN NEL**

Mr. Johan Nel

Archaeologist

Unit Manager: Cultural Resources Management

Social Sciences Department

Digby Wells Environmental

## 1 EDUCATION

- 2001 BA Anthropology & Archaeology, University of Pretoria
- 2002 BA Honours Archaeology, University of Pretoria (UP) (2002)
- Current MA Archaeology

## 2 EMPLOYMENT

- 2010 – present: Archaeologist and CRM specialist, Digby Wells Environmental
- 2005 – 2010: Co-owner and manager of Archaic Heritage Project Management, Cultural Heritage Resources Management consultancy company;
- 2004 – 2005: Resident, professional archaeologist, Rock Art Mapping Project based at Didima / Cathedral Peak, Ukhahlamba-Drakensberg World Heritage Site, Department of Geomatics, University of KwaZulu-Natal;
- 2003 – 2004: Freelance, professional archaeologist;
- 2002 – 2003: Special Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 2000 – 2002: Technical Assistant, Physical Anthropology Unit, Department of Anatomy, University of Pretoria;
- 1999 – 2000: Assistant in Mapungubwe Project, Department of Anthropology and Archaeology, University of Pretoria;
- 1998 - 1999: Volunteer at National Cultural History Museum, Pretoria, Writer for BAT ('By About Town) arts section in Perdeby, official University of Pretoria student newspaper.

### 3 EXPERIENCE

#### PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENTS:

- Above Ground Storage Tanks survey, SASOL Oil (Pty) Ltd, Free State Province, South Africa
- Access road establishment , AGES-SA, Tzaneen, South Africa
- Boikarabelo Railway Link, Resgen South Africa, Steenbokpan, South Africa
- Conversion of prospecting rights to mining rights, Georock Environmental, Musina, South Africa
- Galaxy Gold Agnes Mine, Barberton, South Africa
- HCI Khusela Palesa Extension, Bronkhorstspuit, South Africa
- Kennedy's Vale township establishment, AGES-SA, Steelpoort, South Africa
- Koidu Diamond Mine, Koidu Holdings, Koidu, Sierra Leone
- Lonmin Platinum Mine water pipeline survey, AGES-SA, Lebowakgomo, South Africa
- Mining right application, DERA Environmental, Hekpoort, South Africa
- Mogalakwena water pipeline survey, AGES-SA, Limpopo Province, South Africa
- Nzoro Hydropower Station, Environmental and Social Impact Assessment, DRC
- Randgold Kibali Gold Project, Environmental and Social Impact Assessment, Kibali, Democratic Republic of the Congo
- Randwater Vlakfontein-Mamelodi water pipeline survey, Archaeology Africa cc, Gauteng, South Africa
- Residential and commercial development, GO Enviroscience, Schoemanskloof, South Africa
- Temo Coal, Limpopo, South Africa
- Transnet Freight Line survey, Eastern Cape and Northern Cape, ERM, South Africa
- Van Reenen Eco-Agri Development Project, GO Enviroscience, South Africa
- Platreef Platinum Mine, Ivanhoe Nickel & Platinum, Mokopane, South Africa

#### MITIGATION PROJECTS:

- Mitigation of Iron Age archaeological sites: Kibali Gold Project, DRC
- Mitigation of Iron Age metalworking site: Koidu Diamond Mine, Sierra Leone
- Mitigation of Iron Age sites: Boikarabelo Coal Mine, South Africa
- Exploratory test excavations of alleged mass burial site: Rustenburg, Bigen Africa Consulting Engineers, South Africa
- Mitigation of Old Johannesburg Fort: Johannesburg Development Agency (JDA), South

## Africa

- Site monitoring and watching brief: Department of Foreign Affairs Head Office, Imbumba-Aganang Design & Construction Joint Venture, South Africa

## GRAVE RELOCATION

- Du Preezhoek-Gautrain Construction, Bombela JV, Pretoria, South Africa
- Elawini Lifestyle Estate social consultation, PGS (Pty) Ltd, Nelspruit, South Africa;
- Motaganeng social consultation, PGS (Pty) Ltd Burgersfort, South Africa
- Randgold Kibali Mine, Relocation Action Plan, Kibali, DRC
- Repatriation of Mapungubwe National Park and World Heritage Site, DEAT, South Africa
- Smoky Hills Platinum Mine social consultation, PGS (Pty) Ltd Maandagshoek South Africa
- Southstock Colliery, Doves Funerals, Witbank, South Africa
- Tygervallei. D Georgiades East Farm (Pty) Ltd, Pretoria, South Africa
- Willowbrook Ext. 22, Ruimsig Manor cc, Ruimsig, South Africa
- Zondagskraal social consultation, PGS (Pty) Ltd, Ogies, South Africa
- Zonkezizwe Gautrain, PGS, (Pty) Ltd, Midrand, South Africa

## OTHER HERITAGE ASSESSMENTS AND REVIEWS:

- Heritage Scoping Report on historical landscape and buildings in Port Elizabeth: ERM South Africa
- Heritage Statement and Cultural Resources Pre-assessment scoping report on Platreef Platinum Mine, Mokopane: Platreef Ltd
- Heritage Statement and Scoping Report on five proposed Photo Voltaic Solar Power farms, Northern Cape and Western Cape: Orlight SA
- Land claim research Badenhorst family vs Makokwe family regarding Makokskraal, Van Staden, Vorster & Nysschen Attorneys, Ventersdorp South Africa
- Research report on Cultural Symbols, Ministry for Intelligence Services, Pretoria, South Africa
- Research report on the location of the remains of kings Mampuru I and Nyabela, National Department of Arts and Culture, Pretoria, South Africa
- Review of Archaeological Assessment: Resources Generation, Coal Mine Project in the Waterberg area, Limpopo Province
- Review of CRM study and compilation of Impact Assessment report, Zod Gold Mine, Armenia

## ACADEMIC FIELDWORK

Five seasons hosted: survey, mapping and excavation historic / Late Farmer Community sites on farms Bivack 14 MR and Eerstekrans 16 MR for personal MA research, Department of Anthropology and Archaeology, UP.

Ten projects / seasons attended as Teaching Assistant / Member of Staff

Eight projects / field seasons attended on invitation as undergraduate and graduate student

## 4 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional Member
- ASAPA Cultural Resources Management (CRM) section: Accredited member
- International Association of Impact Assessors (South Africa)
- Society for Africanist Archaeologists (SAFA)

## 5 PUBLICATIONS

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. 2001. 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: 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 for the 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. 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.



## **Appendix B: Fossil Monitoring and Chance Find Procedures**

## 1 CHANCE FIND PROCEDURES FOR HERITAGE RESOURCES

The following procedures must be considered in the event that previously unknown heritage resources, including burial grounds or graves, are exposed or found during the life of the project (extracted and adapted from the National Heritage Resources Act, 1999 Regulations Reg No. 6820, GN: 548).

### List of Acronyms

<b>CRM</b>	Cultural Resources Management
<b>HIA</b>	Heritage Impact Assessment
<b>NHRA</b>	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
<b>PHRA</b>	Provincial Heritage Resources Authority
<b>SAHRA</b>	South African Heritage Resources Authority
<b>SAPS</b>	South African Police Service

For simplicity, the term 'heritage resource' includes burial grounds and graves, unless these are specifically addressed.

Heritage Resources: structures, archaeology, palaeontology, meteors, public monuments

1. The heritage resource must be avoided and all activities in the immediate vicinity temporarily ceased;
2. The Digby Wells project manager and/or CRM unit must be notified of the discovery;
3. Digby Wells will deploy a qualified specialist to consider the heritage resource, either via communicating with the Environmental Officer via telephone or email, or based on a site visit;
4. Appropriate measures will then be presented to Exxaro Coal (Pty) Ltd (Exxaro);
5. Should the specialist conclude that the find is a heritage resource protected in terms of the NRHA (Sections 34, 36, 37) and NHRA Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or PHRA on behalf of Exxaro; and
6. SAHRA/PHRA may require that a HIA in terms of NHRA (1999) Section 38 must take place that may include rescue excavations, for which Digby Wells will submit costs and proposal as relevant.

Burial grounds and graves

1. In the event that human remains were accidentally exposed, the Digby Wells project manager and/or Cultural Resources Management (CRM) unit must immediately be notified of the discovery in order to take the required further steps:
  - a. The local SAPS will be notified on behalf of Exxaro;
  - b. Digby Wells will deploy a suitably qualified specialist to inspect the exposed burial and determine in consultation with the SAPS whether:
    - i. The temporal context of the remains, i.e.:
      - forensic,
      - authentic burial grave (informal or older than 60 years, NHRA (1999) Section 36); or
      - archaeological (older than 100 years, NHRA (1999) Section 38).
    - ii. Any additional graves may exist in the vicinity.
2. Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999) Section 35 and NHRA (1999) Regulations (Regulation 38, 39, 40), Digby Wells will notify SAHRA and/or PHRA on behalf of Exxaro;
3. SAHRA/PHRA may require that an identification of interested parties, consultation and /or grave relocation take place;
4. Consultation must take place in terms of NHRA (1999) Regulations 39, 40, 42;
5. Grave relocation must take place in terms of NHRA (1999) Regulations 34

Digby Wells can facilitate and assist with all chance find procedures outlined above.

HRM Unit:	Johan Nel
	Work: 011 789 9495
	Cell: 072 288 5496

## 2 FOSSIL FIND PROCEDURES

### List of Acronym

ECO	Environmental Control Officer
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### 2.1 Introduction

In the context under consideration, it is improbable that fossil finds will require declarations of permanent “no go” zones. At most, a temporary pause in activity at a limited locale may be required. The strategy is to rescue the material as quickly as possible.

The procedures suggested below are in general terms, to be adapted as befits a context. They are described in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur.

Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

### 2.2 Isolated Bone Finds

In the process of digging excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds six pieces, the finds must be treated as a bone cluster (below).

#### 2.2.1 Response by personnel in the event of isolated bone finds

The following responses should be undertaken by personnel in the event of isolated bone finds:

- **Action 1:** An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside;
- **Action 2:** The site foreman and Environmental Control Officer (ECO) must be informed;
- **Action 3:** The responsible field person (site foreman or ECO) must take custody of the fossil. The following information is to be recorded:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of hole showing vertical section (side); and
  - Digital image of fossil.
- **Action 4:** The fossil should be placed in a bag (e.g. a Ziploc bag), along with any detached fragments. A label must be included with the date of the find, position information, and depth; and

- **Action 5:** The ECO is to inform the developer who then contacts the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

### **2.2.2 Response by Palaeontologist in the event of isolated bone finds**

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established.

## **2.3 Bone Cluster Finds**

A bone cluster is a major find of bones (e.g. several bones in close proximity or bones resembling parts of a skeleton). These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

## **2.4 Response by personnel in the event of a bone cluster find**

The following responses should be undertaken by personnel in the event of bone cluster finds:

- **Action 1:** Immediately stop excavation in the vicinity of the potential material. Mark or flag the position as well as the spoil heap that may contain fossils;
- **Action 2:** Inform the site foreman and the ECO; and
- **Action 3:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is then to describe the occurrence and provide images via email.

## **2.5 Response by Palaeontologist in the event of a bone cluster find**

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out.

It will be probably be feasible to avoid the find and continue to the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the developer/owner and the environmental consultant.

The Field Assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.



## 2.6 Rescue Excavation

Rescue Excavation refers to the removal of the material from the “design” excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonable rapid to avoid any undue delays, e.g. one to three days and definitely less than one week.

In principle, the strategy during the mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossil and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material in sand; and
- Fragile material in loose sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a “Major Find”, a carefully controlled excavation is required.

## 2.7 Major Finds

A Major Find is the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromise of detailed material recovery and contextual observations.

### 2.7.1 Management Options for Major Finds

In consultation with the developer/owner and the environmental consultant, the following options should be considered when deciding on how to proceed in the event of a Major Find.

#### *Option 1: Avoidance*

Avoidance of the Major Find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option from a construction perspective.

The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, the exposed finds can be stabilised and the site refilled or capped. The latter is preferred if excavation of the find will be delayed substantially or indefinitely. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities.

This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

#### *Option 2: Emergency Excavation*

Emergency excavation refers to the “no option” situation where avoidance is not feasible due to design, financial and time constraints. It can delay construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by an excavator and

conveying this by truck from the immediate site to a suitable place for “stockpiling”. This material could then be processed later.

Consequently, the emergency excavation is not the preferred option for a Major Find.

## **2.8 Exposure of Fossil Shell Beds**

### **2.8.1 Response by personnel in the event of intersection of fossil shell beds**

The following responses should be undertaken by personnel in the event of intersection with fossil shell beds:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and
  - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

### **2.8.2 Response by the palaeontologist in the event of fossil shell bed finds**

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

## **2.9 Exposure of Fossil Wood and Peats**

### **2.9.1 Response by personnel in the event of exposure of fossil wood and peats**

The following responses should be undertaken by personnel in the event of exposure of fossil wood and peats:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and

- Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

### **2.9.2 Response by the palaeontologist in the event of exposure of fossil wood and peats**

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

### 3 MONITORING FOR FOSSILS

#### List of Acronyms

<b>ECO</b>	Environmental Control Officer
<b>MA</b>	Monitoring Archaeologist

A regular monitoring presence over the period during which excavations are made, by either an archaeologist or palaeontologist, is generally not practical.

The field supervisor or foreman and workers involved in digging excavations must be encouraged and informed of the need to watch for potential fossil and buried archaeological material. Workers seeing potential objects are to report to the field supervisor who, in turn, will report to the Environmental Control Officer (ECO). The ECO will inform the archaeologist and/or palaeontologist contracted to be on standby in the case of fossil finds.

To this end, responsible persons must be designated. This will include hierarchically:

- The field supervisor or foreman who is going to be most often in the field;
- The ECO for the project;
- The Project Manager

Should the monitoring of excavations be stipulated in the Archaeological Impact Assessment and/or the Heritage Impact Assessment, the contracted Monitoring Archaeologist (MA) can also monitor for the presence of fossils and make a field assessment of any material brought to attention. The MA is usually sufficiently informed to identify fossil material and this avoids additional monitoring by a palaeontologist. In shallow coastal excavations, the fossils encountered are usually in an archaeological context.

The MA then becomes the responsible field person and fulfils the role of liaison with the palaeontologist and coordinates with the developer and the ECO. If fossils are exposed in non-archaeological contexts, the palaeontologist should be summoned to document and sample/collect them.