HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED THABAMETSI PROJECT, LEPHALALE, LIMPOPO PROVINCE

EXXARO COAL (PTY) LTD

JANUARY 2013

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DIGBY WELLS ENVIRONMENTAL

This document has been prepared by **Digby Wells Environmental**.

Report Title:	**Heritage Impact Assessment for the Proposed Thabametsi Project, Lephalale, Limpopo Province**
Report type:	**Heritage Impact Assessment to Section 38(8) NHRA**
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EXECUTIVE SUMMARY

Digby Wells Environmental has been requested by Exxaro Coal (Pty) Ltd to conduct an Environmental Impact Assessment (EIA) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) for the Proposed Thabametsi Coal Mine (Thabametsi Project). The EIA will be conducted for the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, McCabesvley 311 LQ, and Vaalpensloop 313 LQ.

Based on the Background Information Document (BID), the South African Heritage Resources Authority (SAHRA) stipulated that a Heritage Impact Assessment (HIA) must be undertaken for the Thabametsi Project area. This report therefore constitutes the HIA component of the Final EIA Report.

This HIA has integrated the results from a previous Phase 1 HIA conducted by Dr Julius Pistorius in 2010 for Exxaro on the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ. The farm Vaalpensloop 313 LQ was not included in the original Phase 1 HIA conducted by Pistorius (2010) because it did not form part of the previous Scope of Work. The current HIA has included the farm Vaalpensloop 313 LQ.

A summary table of identified heritage resources during the field survey is provided below.

Heritage Resource ID	Description	Value	Impact Assessment : pre-mitigation	Impact Assessment : post-mitigation	Suggested Field Rating
S.35-003	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	0	0	0	IV C
S.35-004	Six undiagnostic potsherd ceramic fragments, one diagnostic rim fragment, and one lower grindstone fragment.	4	4	0	IV B
S.35-005	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	0	0	0	IV C
S.35-006	A scatter of ceramic fragments including a single undiagnostic potsherd ceramic fragment and a single rim fragment, and a MSA quartzite flake.	0	0	0	IV C

Heritage Resource ID	Description	Value	Impact Assessment : pre-mitigation	Impact Assessment : post-mitigation	Suggested Field Rating
S.35-007	A single, isolated occurrence of a MSA quartzite flake.	0	0	0	IV C
S.35-008	One MSA hornfel flake and one MSA quartzite discoidal core.	0	0	0	IV C
S.35-009	A single, isolated occurrence of a MSA quartzite flake.	0	0	0	IV C
S.35-010	A single, isolated occurrence of a MSA quartzite flake.	0	0	0	IV C
S.35-011	A single occurrence of one MSA shale flake and one MSA quartzite core.	0	0	0	IV C
S.35-012	A single, isolated occurrence of a MSA quartzite flake.	0	0	0	IV C
S.35-013	Stone tool scatter on border of Leeupoort 312 LQ and McCabesvley 311 LQ.	0	0	0	IV C
S.34-001	A historical house with gables. This house was noted in a 1969 historical aerial photograph. A Deed of Sale dating to 1960 suggests that the structure is older than 50 years.	8	4	1	IV A
S.34-014	A historical house with clay bricks and a low pitched corrugated iron roof on Jackhalsvley 309 LQ.	6	1	0	IV B
S.36-002/1	A single stone-packed child's burial dating to 1959.	9	4	0	IV A

Heritage Resource ID	Description	Value	Impact Assessment : pre-mitigation	Impact Assessment : post-mitigation	Suggested Field Rating
S.36-002/2	A single stone-packed child's burial.	9	4	0	IV A
S.36-002/3	A formal burial with a headstone dating to 1960.	9	4	0	IV A
S.36-002/4	A formal adult burial with a granite headstone dating to 1980.	9	4	0	IV A
S.36-002/5	A formal adult burial with a concrete headstone dating to 1984.	9	4	0	IV A
S.36-002/6	An informal adult burial with a grave marker dating to 1985.	9	4	0	IV A
S.36-002/7	An informal adult burial with a grave marker dating to 1990.	9	4	0	IV A
S.36-015	A single grave on Jackhalsvley 309 LQ.	8	2	0	IV A

The following sites were identified with little archaeological or cultural heritage significance. These sites were significantly recorded and no further mitigation is recommended:

- S.35-003: a single, isolated occurrence of an undiagnostic potsherd ceramic fragment;
- S.35-005: a single, isolated occurrence of an undiagnostic potsherd ceramic fragment;
- S.35-006: a scatter of ceramic fragments including a single undiagnostic potsherd ceramic fragment and a single rim fragment, and a MSA quartzite flake;
- S.35-007: a single occurrence of a MSA quartzite flake;
- S.35-008: one MSA hornfel flake and one MSA quartzite discoidal core;

- S.35-009: a single, isolated occurrence of a MSA quartzite flake;
- S.35-010: a single, isolated occurrence of a MSA quartzite flake;
- S.35-011: a single occurrence of one MSA shale flake and one MSA quartzite core;
- S.35-012: a single, isolated occurrence of a MSA quartzite flake; and
- S.35-013: a stone tools scatter on the border of Leeupoort 312 LQ and McCabesvley 311 LQ.

A historical house with gables was identified on Vaalpensloop 313 LQ Remaining Extent. The historical house was identified on the proposed opencast pit development footprint and will therefore be impacted on. Activities associated with the construction and operation of the opencast mine could cause damage to structures that are over 60 years old: blasting may cause historical structures to be covered by dust, roads may be routed through historical sites causing damage to historical structures, the influx of people could result in vandalism and the possible destruction of structures older than 60 years, and the construction of the mine could change the sense of place and landscape character. Based on the sources of threats and risks, it is recommended that the site undergo Phase 2 mitigation after which development may legally proceed.

A single burial ground consisting of seven formal and informal graves and associated grave goods dating to between 1959 and 1990 was identified during the survey on Vaalpensloop 313 LQ Remaining Extent. The burial ground was identified on the proposed opencast pit development footprint and will therefore be impacted on. The immediate threats include site clearance for development. Potential sources of threats and risk include vandalism by workers on site and/or accidental destruction or alteration of the burial ground by construction workers on site. Based on the potential sources of threats or risk, it is recommended that the burial ground be mitigated before destruction. In terms of the NHRA Section 36, the mitigation measures recommended include grave relocation with consultation with affected families.

The landscape within the Thabametsi Project area is flat with no outcrops, riverbeds, road cuttings or cliffs. These features are commonly used to identify visible palaeontological resources. Due to the absence of these features within the Thabametsi Project area, no visible palaeontological resources could be identified. It is therefore recommended that Chance Find and Fossil Find Procedures and a Fossil Monitoring Program be implemented.

GLOSSARY OF ABBREVIATIONS AND TERMS

ANC	African National Congress
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Art
BSc	Bachelor of Science
BID	Background Information Document
CFP	Chance Find Procedure
CSG	Chief Surveyor General
CRM	Cultural Resource Management
DMR	Department of Mineral Resources
EA	Environmental Authorisation
EAP	Environmental Authorisation Policies
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EP	Environmental Principles
EPFI	Environmental Principles Financial Institutions
EWT	Endangered Wildlife Trust
FFP	Fossil Find Procedure
FSR	Final Scoping Report
GNR	Government Notice Regulation
ha	hectares
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
km	kilometres
LM-IDP	Lephalale Municipality Integrated Development Plan
LM-SDF	Lephalale Municipality Spatial Development Framework
LOBK	Limpopo Omgewingsbewarings Kommittee
LSA	Late Stone Age
m	meters
MJS	Major Jackson Series
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Application

MSA	Middle Stone Age
MSc	Master of Science
NAARIS	National Automated Archival information Retrieval System
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMPA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
OECD	Organisation for Economic Co-operation and Development
OP	Operational Policies
PHRA	Provincial Heritage Resources Authority
PPP	Public Participation Process
PSC	Power Station Coal
RoM	Run of Mine
SA	South Africa
SAHRA	South African Heritage Resources Authority
SAHRIS	South African Heritage Resources Information Systems
SAPS	South African Police Service
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SSCC	Semi-soft cooking coal
SoW	Scope of Work
STP	Shovel Test Pit
ToR	Terms of Reference
WD-IDP	Waterberg District Integrated Development Plan
WESSA	Wildlife and Environmental Society of South Africa
WHCA	World Heritage Convention Act, 1999 (Act No. 49 of 1999)
UWASD	University of the Witwatersrand Archaeological Site Database

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1 INTRODUCTION

Exxaro Coal (PTY) Ltd (Exxaro) is proposing to develop the Thabametsi Coal Mine (Thabametsi Project) on the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, McCabesvley 311 LQ, and Vaalpensloop 313 LQ. The project is situated near the town of Lephalale in the Waterberg District Municipality of the Limpopo Province.

The Thabametsi Project is situated in the Waterberg Coalfield adjacent to the Grootegeluk Coal Mine (Grootegeluk) and near the town of Lephalale in the Limpopo Province. The Thabametsi coal mine will be developed with the objective to initially mine coal via opencast methods for supply to an Independent Power Producer (IPP) coal-fired power station that will be developed by Exxaro to the north of the Thabametsi Project area.

In April 2007, Exxaro was granted a Prospecting Right (DMR Reference: LP30/5/1/1/2/907PK) in terms of Section 17(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) for the above mentioned properties.

A Mining Right Application (MRA) for the proposed project was submitted to the Regional Office of the Department of Mineral Resources (DMR) in April 2002. The MRA was accepted by the DMR as per signed acceptance letter dated 3 August 2012 (DMR Reference: LP30/5/1/2/2/10013MR).

In fulfilment of the requirements stipulated in Section 39 of the MPRDA, an Environmental Impact Assessment (EIA) process will be undertaken for the proposed project.

In 2009, Golder Associates Africa (PTY) Ltd (Golder) was appointed to conduct the baseline assessments and the compilation and submission of the EIA and Environmental Management Plan (EMP) for the proposed main Thabametsi opencast pit. At this time, the EIA and EMP was to be conducted for the Northern Complex which includes the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ and as well as the farms Graafwater 456 LQ and Goedehoop 457 LQ which are not included in the current development plan. Golder appointed an archaeology consultant, Dr Julius Pistorius, to conduct the Phase 1 Heritage Impact Assessment (HIA) for the Thabametsi Project on the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, McCabesvley 311 LQ, Graafwater 456 LQ, and Goedehoop 457 LQ.

Due to uncertainties with regards to the IPP and issues outside of Exxaro's control, the Thabametsi Project was put on hold. The original contract had therefore expired and Exxaro was required to restart the project as clarity with the IPP has been resolved. Exxaro has now appointed Digby Wells Environmental (Digby Wells) to compile the EIA according to the MPRDA and National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) processes. The EIA will be conducted for the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ and will also include the farm Vaalpensloop 313 LQ.

2 BACKGROUND INFORMATION OF PROJECT

2.1 Report Type: NHRA Section 38(8) Heritage Impact Assessment

Digby Wells was requested by Exxaro to conduct an EIA and associated studies in accordance with Section 39 of the MPRDA. This HIA forms part of the EIA undertaken for the proposed Thabametsi Project.

2.2 Context of Development

2.2.1 Type of development

The Thabametsi Project is an undeveloped coal resource in the Waterberg Coalfield that will be developed as an independent coal mine adjacent to Grootegeluk which is owned and operated by Exxaro. Marapong and Onverwacht are the closest towns to the project. The objective of the Thabametsi Project is to initially mine coal via opencast methods for supply to an IPP coal-fired power station that is to be developed by Exxaro north of the proposed Thabametsi Project.

During the development phase, Run of Mine (RoM) coal will be trucked to Grootegeluk. The expansion of the Thabametsi Mine is to follow the rail capacity expansions and raw water supply additions to the area. At this point in time it is foreseen that from 2021 both Power Station Coal (PSC) and semi-soft cooking coal (SSCC) will be produced. The RoM coal suitable from PSC and SSCC will be put on rail to the respective clients. Underground mining will start in 2022 producing metallurgical coal (met coal) RoM which will be transported to the Southern Mine Complex for beneficiation.

2.2.2 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 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 Thabametsi 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 modern 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 Client, Consultant and Land Owner Contact Details

Table 2-1: Client contact details

ITEM	COMPANY CONTACT DETAILS
Company	Exxaro Coal (PTY) Ltd
Contact person	Christo Reeders
Tel no	083 609 1270
E-mail address	christo.reeders@exxaro.com
Postal address	PO Box 9229, Pretoria, South Africa, 0001

Table 2-2: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Brett Coutts
Tel no	011 789 9495
Fax no	011 789 9498
E-mail address	brett.coutts@digbywells.com
Postal address	Private Bag X10046, Randburg, South Africa, 2125

Table 2-3: Land owner contact details for Zaagput 307 LQ

ITEM	CONTACT DETAILS
Contact person	Gideon Erasmus
Tel no	014 766 0151
Cell no	084 678 3561
E-mail address	zaagput@hotmail.com
Title Deed Surface Right Owner	Zaagput Boerdery CC

Table 2-4: Land owner contact details for Jackhalsvley 309 LQ

ITEM	CONTACT DETAILS
Contact person	Jacques Du Plessis
Tel no	017 614 8008
Cell no	079 505 7602
E-mail address	jacques.duplessis@sasol.com
Title Deed Surface Right Owner	Sasol Mining (PTY) Ltd

Table 2-5: Land owner contact details for Van der Waltspan 310 LQ

ITEM	CONTACT DETAILS
Contact person	R. van Wyk/Cristo van Wyk
Cell no	082 469 5265/083 287 2844
E-mail address	christo.vanwyk@spx.com
Title Deed Surface Right Owner	Quick Leap Inv 287 (PTY) Ltd

Table 2-6: Land owner contact details for McCabesvley 311 LQ

ITEM	CONTACT DETAILS
Contact person	Johannes Molepo
Tel no	014 766 0143
Cell no	082 269 6334
E-mail address	johannes.molepo@exxaro.com
Title Deed Surface Right Owner	Exxaro Coal (PTY) Ltd

Table 2-7: Land owner contact details for Vaalpensloop 313 LQ (Portion 1)

ITEM	CONTACT DETAILS
Contact person	Vasti Retief – Du Toit
Tel no	011 615 0041/011 615 0078
Cell no	083 236 3585/071 941 5858
E-mail address	vastiretief@gmail.com
Title Deed Surface Right Owner	Erf 226 Ondekkersweg Bk

Table 2-8: Land owner contact details for Vaalpensloop 313 LQ (Remaining Extent)

ITEM	CONTACT DETAILS
Contact person	Louis Rossel
Cell no	082 772 9700
E-mail address	louis.rossel@lowveldbus.co.za
Title Deed Surface Right Owner	Louis Rossel Trust

3 TERMS OF REFERENCE

3.1 Client Term of Reference

Exxaro has requested Digby Wells to undertake an EIA in accordance with the MPRDA and NEMA. Digby Wells has developed a Heritage Resources Management (HRM) process, aimed at expediting decisions by relevant Heritage Resources Authorities (HRAs), 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 MPRDA and NEMA processes, and is described in more detail in Section 4 of this report.

3.2 Heritage Resources Authority (HRA) Terms of Reference

Based on the Background Information Document (BID), the South African Heritage Resources Authority (SAHRA) stipulated that a HIA must be undertaken for the Thabametsi Project area. SAHRA required that the HIA should include the following:

- Archaeological resources;
- Palaeontological resources;
- Built Environment resources, such as structures older than 60 years;
- Sites of cultural significance associated with oral histories;
- Burial grounds and graves; and
- Cultural landscapes or viewscapes must also be assessed.

Appropriate mitigation (Phase 2) which involves recording, sampling and dating sites that are to be destroyed must be recommended as required.

Subsequently, the Final Scoping Report (FSR) was submitted on which SAHRA provided further comments. The FSR stated that a Notice of Intent to Develop (NID) and Heritage Statement would be submitted to SAHRA to assess the potential impacts on heritage resources and determine which of the above studies should be included.

3.3 Scope of Work

As part of the EIA and recommended ToR received from SAHRA, the Scope of Work (SoW) for the heritage component of the Thabametsi Project consisted of compiling a HIA report which included the Aims and Objectives discussed in Section 3.4 below.

This report constitutes the HIA component of the Final EIA Report to be submitted in accordance with the MPRDA and NEMA. This report has integrated results from the previous HIA conducted by Pistorius (2010) on the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ. The farm Vaalpensloop 313 LQ was not included in the original Phase 1 HIA conducted by Pistorius (2010) because it did not form part of the previous SoW. The revised SoW now includes Vaalpensloop 313 LQ which is included in this HIA.

3.4 Aims and Objectives

The aim of this HIA was to assist the client in identifying, documenting and managing heritage resources found in the proposed project area in a responsible manner. This assessment also aimed to protect, preserve and develop resources within relevant legislative frameworks. In essence, this study aimed to:

- Identify, record and document sites of cultural significance archaeological, palaeontological, cultural and historic sites, including graves and cemeteries, within the proposed development area;
- Evaluate whether proposed activities will have any negative impacts on these heritage resources during construction, operation and decommissioning phases;
- Recommend project-related mitigation and management measures to avoid or ameliorate any negative impacts on structures, objects or sites of cultural significance. where project-related mitigation may not remove impacts, appropriate mitigation of heritage resources were recommended; and
- Promote the overall conservation and protection of natural and cultural resources in the proposed project area and its surroundings.

3.5 Legislative Requirements

The Heritage Statement is governed by national legislation and standards; and International Best Practise. These are discussed below.

3.5.1 NEMA

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Heritage assessments are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures considering heritage resource management in terms of the NEMA are summarised under Section 24(4) as amended in 2008. In addition to the NEMA, the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPA) may also be applicable. This act applies to protected areas and world heritage sites, declared as such in terms of the World Heritage Convention Act, 1999 (Act No. 49 of 1999) (WHCA).

3.5.2 MPRDA

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

3.5.3 World Bank

3.5.3.1 World Bank Operational Policies

The World Bank Operational Policies (OP) for cultural resources (OP4.11) falls within the broader Environmental Authorisation Policies (EAPs). Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. This policy assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that are financed through the World Bank. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements.

3.5.3.2 Equator Principles (EPs)

The Equator Principles Financial Institutions (EPFIs) adopted principles in order to ensure that the projects financed are developed in a manner that is socially responsible and reflect sound environmental management practices. By doing so, negative impacts on project-affected ecosystems and communities should be avoided where possible, and if these impacts are unavoidable, they should be reduced, mitigated and/or compensated for appropriately.

Principle 2: Social and Environmental Assessment

For each project assessed as being either Category A or Category B, the borrower has conducted a Social and Environmental Assessment ("Assessment") process to address, as appropriate and to the EPFI's satisfaction, the relevant social and environmental impacts and risks of the proposed project. The Assessment should also propose mitigation and management measures relevant and appropriate to the nature and scale of the proposed project.

Principle 3: Applicable Social and Environmental Standards

For projects located in non-OECD (Organisation for Economic Co-operation and Development) countries, and those located in OECD countries not designated as High-Income, as defined by the World Bank Development Indicators Database, the Assessment will refer to the then applicable International Finance Corporation (ICF) Performance Standards and the then applicable Industry Specific Environmental Health and Safety (EHS) Guidelines ("EHS Guidelines").The Assessment will establish to a participating EPFI's satisfaction the project's overall compliance with, or justified deviation from, the respective Performance Standards and EHS Guidelines.

3.5.3.3 International Finance Corporation (IFC)

The IFC's Performance Standards form part of the EP's and aims to manage social and environmental risks (and impacts) to enhance development opportunities in its private sector financing in its member countries eligible for financing (IFC, 2012). The main focus of the

risk assessment of a proposed development is primarily on the potential impacts associate with the project activities during construction, operation, and decommissioning and closure phases.

3.5.4 NHRA

3.5.4.1 Section 34 – Structures older than 60 years

The proposed activities associated with the Thabametsi Project will include the construction and subsequent operation of an underground mine, an opencast mine, and associated infrastructure. This will require the removal of existing structures that may be older than 60 years.

Section 34 of the NHRA 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.

3.5.4.2 Section 35 – Archaeological and palaeontological resources and meteorites

Construction and operation activities associated with the Thabametsi Project – in the immediate receiving environment – are likely to impact on archaeological resources.

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).

3.5.4.3 Section 36 – Burial grounds and graves

Construction and operation activities associated with the Thabametsi Project – in the immediate receiving environment – are likely to impact on 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.

3.5.4.4 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.

3.5.4.5 Section 38 - HRM

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

The Listed Activities in terms of the Government Notice Regulations (GNRs) stipulated under NEMA for which Environmental Authorisation (EA) will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

Table 3-1: Listed Activities in terms of the GNRs stipulated under NEMA

NEMA Listed Activity	Potential risk
Linear development	
GNR 544/9 The construction of facilities or infrastructure exceeding 1000 m in length for the bulk transportation of water, sewage or storm water.	■ Site clearance that will be required to prepare construction sites may destroy or damage physical heritage resources, including but not limited to, archaeological sites, palaeontological resources, burial grounds and graves; ■ Site clearance and construction will increase human traffic, increasing the risk to nearby heritage resources in terms of accidental or purposeful damage or destruction; ■ Blasting that may be required could result in damage to or loss of structures, including monuments; ■ Operation and maintenance of facilities will create long-term risk associated with more regular and increased human traffic, allowing access to nearby heritage resources; and ■ Construction of facilities may change the landscape character and may impact on the integrity of remaining nearby heritage resources.
GN R 544/22 The construction of a road, outside urban areas.	
GN R 545/7 The construction of ■ i. airports, or ■ ii. Runways or aircraft landing strips longer than 1.4 km.	

NEMA Listed Activity	Potential risk
Non-linear development	
GN R 545/10 The construction of facilities or infrastructure for the transmission and distribution of electricity.	■ Site clearance that will be required to prepare construction sites may destroy or damage physical heritage resources, including but not limited to, archaeological sites, palaeontological resources, burial grounds and graves; ■ Site clearance and construction will increase human traffic, increasing the risk to nearby heritage resources in terms of accidental or purposeful damage or destruction; ■ Operation and maintenance of facilities will create long-term risk associated with more regular and increased human traffic, allowing access to nearby heritage resources; ■ Increased emissions that may include effluent, dust, ash and other forms of pollution may result in a change to the integrity of certain types of tangible heritage resources; ■ Use and/or diversion of local water sources may result in change to the integrity of archaeological sites such as drying out or flooding, potentially altering the integrity of deposit; ■ Construction of facilities may change the landscape character and may impact on the integrity of remaining nearby heritage resources. Powerlines may be routed through heritage sites.
GN R 545/8 The construction of facilities or infrastructure for the transmission and distribution or electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	
GN R 544/11 The construction of infrastructure of structures covering 50² m or more where such construction occurs within in a watercourse or within 32 m of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	■ In addition to the potential risks described above, construction of infrastructure near watercourses in this landscape significantly increases risk to potential *in situ* Stone Age sites.

3.6 Expertise of Specialists

Johan Nel has completed a Bachelor of Arts (BA) degree in archaeology and anthropology and a BA Honours degree in archaeology at the University of Pretoria. Johan holds the

position of Unit Manager for Heritage Resource Management (HRM) in the Social Science Department at Digby Wells.

Shahzaadee Karodia has completed a BA degree in archaeology and anthropology, a Bachelor of Science (BSc) Honours degree in palaeontology, and a Master of Science (MSc) degree in archaeology. Shahzaadee specialises in palaeoanthropology and historical archaeology. She currently holds the position of Archaeology Consultant at Digby Wells.

Natasha Higgitt has completed a BA Honours degree in archaeology at the University of Pretoria. Natasha specialises in lithics and ceramics. She currently holds the position of Archaeology Consultant at Digby Wells. Refer to Appendix A: Curriculum Vitae of Specialists.

4 METHODOLOGY

This HIA consisted of a desktop study - including background literature reviews, aerial and historical map surveys and a review of relevant impact assessment reports, inferred information – and a pedestrian site survey. A heritage site visit was undertaken for the identification and documentation of potential heritage resources, as stipulated in the NHRA and SAHRA Minimum Standards (2006).

Dr Julius Pistorius conducted the fieldwork for Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ in October 2012. Digby Wells' heritage consultants conducted the site survey Vaalpensloop 313 LQ from 2 to 4 November 2012 and from 20 to 23 November 2012.

4.1 Survey and Sampling

The Thabametsi Project area, including the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ, were surveyed by Dr Julius Pistorius in October 2010. The project area was surveyed with a vehicle where accessible roads existed while selected, sensitive spots in the project area were surveyed on foot (Pistorius, 2010).

A vehicle and pedestrian survey was undertaken by Digby Wells' heritage specialists for three days on Vaalpensloop 313 LQ Portion 1 from 2 to 4 November 2012 and for three days on Vaalpensloop 313 LQ Remaining Extent from 20 to 23 November 2012. The survey was conducted in proposed footprint areas that included a discard dump, opencast pit area and infrastructure development which includes water treatment plants, dams, and offices on Vaalpensloop 313 LQ Portion 1. The survey then continued along the proposed opencast pit, pit waste dump and underground mining areas on Vaalpensloop 313 LQ Remaining Extent.

The vehicle and pedestrian survey was aimed at locating and documenting potential sites of heritage significance located within the project boundaries and its immediate surrounds. The survey was conducted by systematically walking in a linear path. Where the vegetation was too thick, the survey was conducted randomly on foot. General site conditions and features

were recorded by means of photographs, GPS location, and description. A pedestrian survey was done to identify and record any sites found *in situ*.

4.1.1 Site naming

Sites identified during the survey were named using the Digby Wells project number, followed by the map sheet number and the relevant NHRA section suffixed with the site number: **EXX564/2327CB/S.35-001**

This number is abbreviated in tables and/or on plans or maps using the NHRA reference number suffixed with the site number: **S.35-001**.

4.2 Data Acquisition

Data acquisition was aimed at information gathering relating to known heritage resources within and surrounding the proposed area for development. Project information and data was obtained through intensive research and data gathering, including a variety of primary and secondary sources such as academic journals, textbooks and records, national and provincial websites, archaeological field guides, national guidelines, maps, photographs and plans. Surveys of historical aerial photographs, historical maps, topographical maps and satellite imagery were undertaken to plot potential sites. Some older maps such as the Major Jackson Series (MJS) maps of the early 20th century were also consulted and integrated into the HIA where applicable. These are invaluable resources as they often include features and information not recorded on later maps.

4.3 Public Participation and Consultation

Public participation is an essential and legislative requirement for environmental authorisation in a number of the major Acts applicable to this proposed project, the Thabametsi Project. The principles that demand communication with society at large are best embodied in the principles of the NEMA Chapter 1, South Africa's overarching environmental law. In addition, Section 24 (5), Regulation 54-57 of GNR 543 under the NEMA, guides the public participation process that is required for an EIA process. In addition, the public participation process will be conducted in line with the Equator Principles (EP).

The objectives of the public participation process are to ensure that all stakeholders and interested and affected parties (I&APs) are given accurate and timeous project information, and are given an opportunity to raise comments and concerns.

4.4 Assessment

4.4.1 Assessment of resource significance/value

Identified heritage resources' cultural significance was assessed relative to the National Estate in terms of Section 3 of the NHRA. Potential impacts on the heritage resources were assessed in terms of Digby Wells' standard EIA methodology, as well as in terms of the

impact assessment criteria and ratings as detailed in the Association of Southern African Professional Archaeologists (ASAPA) guidelines and the SAHRA guidelines. The site significance and impact assessment will be integrated into the final EIA Report.

The assessment of heritage resources includes three distinct but complimentary assessment criteria: value, field rating, and impact assessment. A brief description of the assessment methodology will be presented here. See Appendix C: Impact Methodology and Assessment of Resource Significance/Value for a full description of the assessment methodology.

In order to determine the value or significance of a heritage resource, the importance of that resource in terms of its authenticity and integrity at the time of the assessment must be determined. Importance is based on four dimensions – artistic, historic, scientific and social – each with a subset of attributes that may assist in determining the importance of the resources on each dimension. The authenticity of a heritage resource is then determined on the credibility of available information sources. Lastly, the degree of integrity is based on the condition of the resource at the time of assessment compared to the ideal or to other known examples. Once the importance, authenticity and integrity of a heritage resource are achieved, the value of that heritage resource can then be assessed.

Field ratings or the proposed grading of heritage resources are required by SAHRA in terms of Section 7(1) of the NHRA. Field ratings prescribe criteria for assessing heritage resources consistent with Section 3(3) of the NHRA.

Assessment of impacts on heritage resources relies on two factors that must be considered when rating impacts:

- The potential physical and/or visual impact on the heritage resource; and
- The impact on the cultural landscape should any heritage resource change or be destroyed.

The impact rating takes into accounts the special scale, the expected duration, the severity, the consequence, and the probability of the impact as well as the value of the heritage resource. The impact rating is then applied to pre-mitigation and post-mitigation scenarios with the intention of removing all impacts on heritage resources.

5 DESCRIPTION OF PROPERTY AND/OR AFFECTED ENVIRONMENT

5.1 Details of Area Surveyed

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

A summary of the geographical location of the Thabametsi Project is presented in Table 5-1 below.

Table 5-1: Location data

Province	Limpopo Province
Magisterial District / Local Authority	Waterberg District Municipality
Municipality	Lephalale Municipality
Property Name and Number	Zaagput 307 LQ Jackhalsvley 309 LQ Van der Waltspan 310 LW McCabesvley 311 LQ Vaalpensloop 313 LQ
1: 50 000 Map Sheet	2327 CB
1: 10 000 Aerial Photo	216_015_01016
GPS Co-ordinates (relative centre point of study area)	East/LON/X: 27.4732 South/LAT/Y: -236975

5.1.1 Location maps

The regional settings of the Thabametsi Project are depicted in Plan 1, Plan 2, and Plan 3 in Appendix B: Location and Site Maps.

5.1.2 Site maps

The GPS track log and position of sites are depicted in Plan 4 and Plan 5 respectively in Appendix B: Location and Site Maps.

6 RESTRICTIONS, LIMITATIONS, AND KNOWLEDGE GAPS

The following restrictions were encountered during the course of this study:

- Dense grass cover obscured surface visibility thereby reducing potential to identify surface material or features.
- The landscape of the immediate receiving environment is flat with no outcrops, river banks, or road cuttings and few koppies. The fossil potential can therefore only be determined through exposure.
- Archaeological remains may be located on a sub-surface level (Figure 7-2).

- Leopards were encountered whilst conducting pedestrian surveys on Vaalpensloop 313 LQ. For safety reasons, areas where the animals were seen were avoided, especially dense vegetation that prevented sufficient sighting.
- Existing fields (Figure 7-1), farm roads, fences (Figure 7-3) and boreholes occur in the area. These features may have damaged or destroyed any heritage resources could occur there.

The following limitations to this study were identified:

- The farm Vaalpensloop 313 LQ Portion 1 could only be accessed on 2 to 4 November 2012 due to the availability of the landowner. In addition, only one heritage specialist was available at the time. As a result the survey could only be conducted on the proposed development footprint.

The following knowledge gaps were identified:

- Heritage resources do not exclusively constitute visible and tangible remains, but also more intangible aspects such as sense of place and associations. This study did not include focussed consultation with communities in relation to heritage resources. However, any issues that were raised during the public participation process and Social Impact Assessment (SIA) were integrated into this report.
- The distribution of palaeontological resources is unpredictable and may only be identified by a qualified specialist after exposure.

Considering the above restrictions, limitations and knowledge gaps there is potential that additional heritage resources may be exposed or identified during the course of the project. Consequently, Chance Find Procedures (CFPs) and Fossil Find Procedures (FFPs) must be implemented as required by the NHRA. See Appendix D: Chance Find Procedures, Fossil Find Procedures and Fossil Monitoring for a full description of CFP and FFP methodology.

7 SITE CONDITIONS AND LOCATION DATA

The Thabametsi Project area lies within the Savannah Biome which covers over one-third of the area of South Africa (Low & Rebelo, 1996). The landscape consists of undulating to flat plains at an altitude of 700 m to 1100 m. the soil is mostly coarse, sandy and shallow, overlying granite, quartzite, sandstone and shale (Low & Rebelo, 1996). Within the project area, the vegetation varies between Sweet Bushveld and Mixed Bushveld (Van Rooyen & Bredenkamp, 1996). The fauna that are expected to occur in the immediate area include types within terrestrial and wetland ecosystems: mammals, birds, reptiles, amphibians and invertebrates.

The Sweet Bushveld vegetation is not regarded to be threatened and approximately 5% of it has been transformed for cultivation. The rainfall is low and the area is regarded to be good for game and cattle farming due to the high grazing capacity of the sweet veld (Mucina & Rutherford, 2006). The vegetation structure consists of short open woodland with a variety of shrubs and small trees. The grass sword is well developed in undisturbed areas while in

disturbed area the vegetation is dominated by thickets of trees such as *Dichrostachys cinerea* and *Acacia mellifera* which are nearly impenetrable (Mucina & Rutherford, 2006).

During the site visit, the general conditions of the area survey were recorded. The climate was hot and sunny with a maximum of 42°C. The farm Vaalpensloop 313 LQ is flat with an absence of hills, outcrops, and streams. There are two open fields on Vaalpensloop 313 LQ Remaining Extent (Figure 7-1). Where the vegetation was too thick to walk through (Figure 7-2), the survey was redirected along the farm roads (Figure 7-3).

Figure 7-1: Existing fields may have damages, destroyed or altered heritage resources in the area

Figure 7-2: The vegetation was thick and obscured visibility

Figure 7-3: Where the vegetation was too thick to walk through the survey was redirected along gravel or dirt roads

The GPS data is presented in Table 7-1 below.

Table 7-1: GPS data

GPS type and model used	Garmin eTrex Legend HCx	
Datum	WGS 84	
Average accuracy	~5 m	
Site co-ordinates	**Site Names**	**Description**
East/LON/X: -23.6864 South/LAT/Y: 27.4736	S.34-001	Historical house with gables. This house dates to the 1960s.
East/LON/X: -23.6807 South/LAT/Y: 27.4726	S.36-002	Burial ground containing seven graves.
East/LON/X: -23.6773 South/LAT/Y: 27.4637	S.35-003	A single undiagnostic potsherd.
East/LON/X: -23.6786 South/LAT/Y: 27.4749	S.35-004	Six undiagnostic potsherds and one diagnostic rim fragment & a lower grinding stone fragment.
East/LON/X: -23.6796 South/LAT/Y: 27.4758	S.35-005	A single undiagnostic potsherd.
East/LON/X: -23.6796 South/LAT/Y: 27.4778	S.35-006	One undiagnostic potsherd, one diagnostic rimsherd and one MSA quartzite flake.

East/LON/X: -23.6843 South/LAT/Y: 27.4796	S.35-007	A MSA quartzite flake.
East/LON/X: -23.6896 South/LAT/Y: 27.4815	S.35-008	A MSA hornfel flake & a MSA quartzite discoidal core.
East/LON/X: -23.6883 South/LAT/Y: 27.4806	S.35-009	A MSA quartzite flake.
East/LON/X: -23.6983 South/LAT/Y: 27.4772	S.35-010	A MSA quartzite flake.
East/LON/X: -23.7014 South/LAT/Y: 27.4775	S.35-011	A MSA quartzite flake.
East/LON/X: -23.7033 South/LAT/Y: 27.4929	S.35-012	A MSA quartzite flake.
East/LON/X: -23.6513 South/LAT/Y: 27.4781	S.35-013	Stone tool scatter on Leeupoort 312 LQ and McCabesvley 311 LQ (Pistorius, 2010).
East/LON/X: -23.6680 South/LAT/Y: 27.4729	S.36-015	A single grave on Jackhalsvley 309 LQ (Pistorius, 2010).

8 DESCRIPTION OF CONSULTATION WITH STAKEHOLDERS AND INTERESTED AND AFFECTED PARTIES

The Public Participation Process (PPP) conducted for this project followed a consultative approach. This was achieved by encouraging active engagement from stakeholders so that suggestions and comments can be incorporated into the project design and that concerns and conflicts can be openly addressed in an on-going manner. Through the PPP, adequate and timely information was provided to all Interested and Affected Parties (I&AP) to ensure they are given sufficient opportunity to voice their opinions, concerns and issues. The PPP provided a platform for issues and comments to be raised that will add value to the EIA process, thereby influencing the decision-making process. The following tasks were undertaken:

- Stakeholder identification;
- Development of appropriate documentation;
- Stakeholder notification (through the dissemination of information and meeting invitations);
- One-on-one meetings were undertaken with relevant local authorities, directly affected and surrounding landowners, farm occupiers and land claimants;
- The compilation of a Draft Scoping Report in terms of NEMA process which was made available to I&AP in November 2012; and
- The compilation of a Draft EIA that was submitted to the DMR on 7 January 2013 and made available for public review until 28 January 2013, during which two public meetings were held on 16 and 17 January 2013.

See Appendix E: Registered Stakeholders for a complete list of all registered stakeholders.

8.1 Parties Consulted

Representatives of seven registered conservation bodies were registered as stakeholders and are presented in Table 8-1 below. No specific local bodies were identified. Of the seven conservation bodies only the Mapungubwe Action Group may have specific focus on cultural heritage.

Table 8-1: Registered conservation bodies for the Thabametsi Project

Registered Conservation Bodies	
Carolyn Verdoorn	Birdlife South Africa (SA)
Harriet Davies-Mostert	Endangered Wildlife Trust (EWT)
Anique Greyling	EWT
Rico Euripidou	GroupWork - Friends of the Earth

Registered Conservation Bodies	
Siziwe Khanyile	GroupWork - Friends of the Earth
Megan Lewis	GroupWork - Friends of the Earth
Bobby Peek	GroupWork - Friends of the Earth
J.J. Pretorius	Limpopo Omgewingsbewarings Kommittee(LOBK)
Nick Hiltermann	Mapungubwe Action Group
Ann Turner	The Ground Hornbill Research & Conservation Project
Kerry Batytpp	Wildlife and Environmental Society of South Africa (WESSA)
Luke Perkins	WESSA
John Wessa	WESSA

8.2 Results with Regard to Heritage Resources

The comments pertaining to heritage that were addressed in the Comments and Response Report are presented in Table 8-2 below.

Table 8-2: I&APs consulted and the comments pertaining to heritage that were raised during the public consultation process

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
Ms Thandi Moraka - Limpopo Legislature	17 September 2012 - Mayoral Committee meeting	What is considered with regards to heritage sites?	Exxaro does not want to destroy any heritage sites that may be potentially affected by the proposed project. Exxaro has commissioned independent specialists to conduct a Heritage Impact Assessment (HIA) to address such issues. Refer to Appendix G of the Draft EIR for the HIA Report.

I&APs	Date & Media	Issue or Concern	Response
HERITAGE			
Mr Patrick Mojela - African National Congress (ANC) Youth League Member and Marapong Community Member	18 September 2012 - Information sharing meeting	Can the mine plant or warehouse be named after the owners of the land or the communities who used to leave there just to show appreciation and recognition to the community? The community is grateful that the mine has been named “Thabametsi”, which is a localised word and that the communities can relate with in terms of preserving the culture/heritage of the area.	Comment noted. In terms of the HIA, should any graves be identified within the mining footprint, consultation with the affected families will need to be undertaken after the families have been identified. A negotiation process is then established with the affected families in terms of the relocation process.

9 STATE OF RECEIVING ENVIRONMENTAL - CULTURAL LANDSCAPE

The cultural landscape of the study are can be categorised by the occurrence of Late Iron Age such as Tswana type settlements, scatterings of Middle Stone Age (MSA) and Late Stone Age (LSA) material, and 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.

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 reserved are being mined at Grootegeluk coal mine adjacent to the Thabametsi Project area. 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).

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. Refer to Appendix F: Heritage Statement for a detailed description of the receiving cultural and palaeontological landscape.

10 DESCRIPTION OF ARCHAEOLOGICAL AND HISTORICAL RESOURCES

10.1 EXX564/2327CB/S.35-003 (Isolated Iron Age occurrence)

Site S.35-003 represents a single, isolated occurrence of an undiagnostic potsherd ceramic fragment. The fragment was found in grey clay soil and it may be associated with animal burrows in the immediate vicinity. No other material culture or features were noted that might provide any further context to the site. No evidence of archaeological deposit was noted in any of the burrows.

This site is located in the proposed underground mine development area.

Table 10-1: Summary of Site S.35-003

Site type	Isolated occurrence
Site category	Iron Age
Site location	**Site co-ordinates** East/LON/X: -23.6773 South/LAT/Y: 27.4637 The site is located in the underground mine footprint.
Context	Secondary
Cultural affinities	Unknown
Age	Iron Age to Historic, possibly even contemporary
Significant features	Animal burrows
Site extent and orientation	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment found near animal burrows
Stratification	None
Past environment information	None

Threats or sources of risk	
Activities associated with infrastructure construction of the underground mine may cause the alteration and/or destruction of the site.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Ceramics	
A single, isolated occurrence of a 1 cm undiagnostic potsherd ceramic fragment.	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-1: General view of Site S.35-003

Figure 10-2: A single, isolated occurrence of an undiagnostic potsherd ceramic fragment identified at Site S.35-003

10.2 EXX564/2327CB/S.35-004 (Iron Age open scatter)

A concentration of ceramic fragments and a single lower grindstone fragment were noted next to a farm road in a clearing about 25 m x 23 m. The ceramics included six undiagnostic potsherd ceramic fragments and one potential diagnostic piece noted as a rim fragment that was recently broken in half. No other material culture or features were noted, nor any evidence of sub-surface deposit.

This site is located in the proposed opencast pit mining area.

Table 10-2: Summary of Site S.35-004

Site type	Open scatter
Site category	Iron Age
Site location	**Site co-ordinates** East/LON/X: -23.6786 South/LAT/Y: 27.4749 The site is located in the opencast pit footprint.
Context	Secondary
Cultural affinities	Unknown
Age	Iron Age
Significant features	Six undiagnostic potsherds, one diagnostic rim fragment, and one lower grindstone fragment
Site extent and orientation	25 m x 25 m
Stratification	None
Past environment information	A farm road appears to have been routed through the site
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Ceramics	
A concentration of ceramic fragments including six undiagnostic potsherd ceramic fragments and one diagnostic potsherd noted as a rim fragment that was recently broken in half.	

Other	
A lower grindstone fragment	
Statement of Value	**Field rating: Grade IV B** The site/resource value was considered low in terms of importance and integrity. The rating was informed by credible information sources such as peer-reviewed publications and other impact assessment reports, which indicate that ceramic scatters and associated artefacts such as the grindstone may indicate more extensive subsurface deposits. Site context site was considered secondary, as the ceramics may have been exposed due to the road, and integrity could not be determined. Mitigation of the site by means of detailed site recording and mapping was considered, that should include shovel test pits (permit dependant) to determine site integrity – if any – and whether it extends subsurface. Site significance should be reassessed subsequent to the proposed mitigation of the site. Project-related mitigation measures will depend on the results and reassessment of significance, but should initially include avoidance of the site until it has been recorded, mapped and sampled.

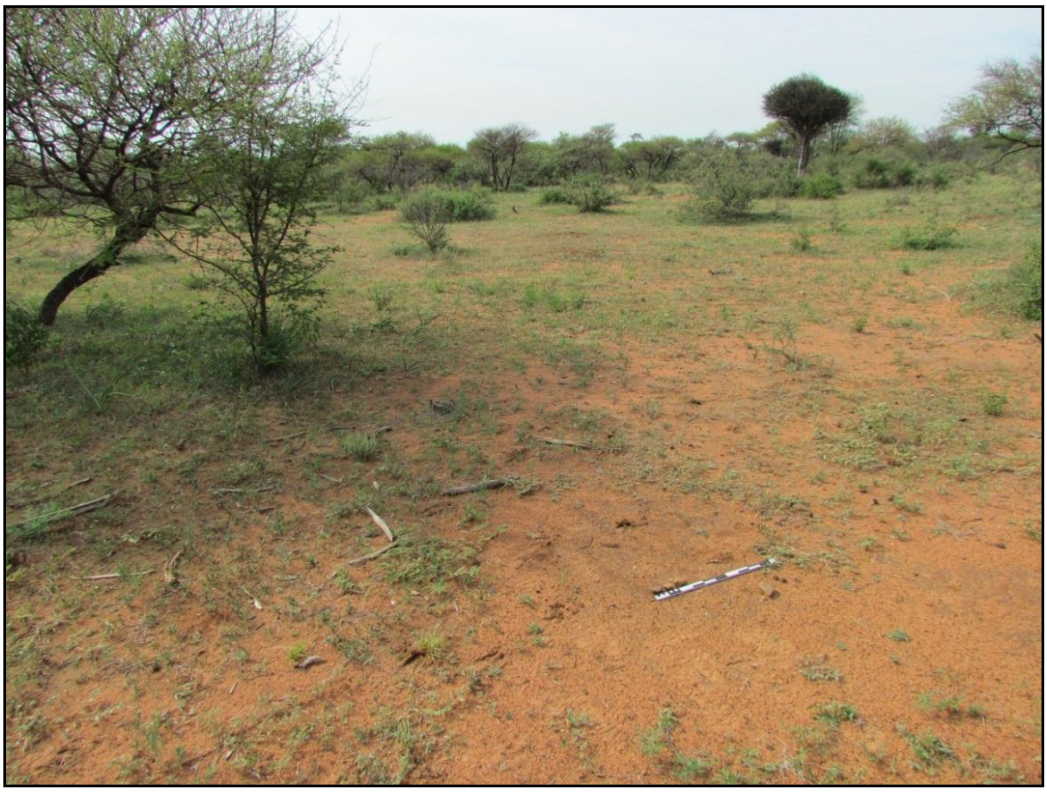

Figure 10-3: General view of Site S.35-004

Figure 10-4: Three undiagnostic potsherd ceramic fragments identified at Site S.35-004. The potsherd at the far right is 2 cm thick

Figure 10-5: Three undiagnostic potsherd ceramic fragments and a single diagnostic rim fragment recently broken in half (far right) noted at Site S.35-004

Figure 10-6: A lower grinding stone fragment noted at Site S.35-004

10.3 EXX564/2327CB/S.35-005 (Isolated Iron Age occurrence)

Site S.35-007 represents a single, isolated occurrence of an undiagnostic potsherd ceramic fragment. The fragment was found in grey soil and it may be associated with animal burrows in the immediate vicinity. The fragment may also be associated with the open scatter of potsherds identified at Site S.35-004 approximately 150 m north-west of S.35-005. No other material culture or features were noted that might provide any further context to the site. No evidence of archaeological deposit was noted in any of the animal burrows.

This site is located in the proposed opencast pit mining area.

Table 10-3: Summary of Site S.35-005

Site type	Isolated occurrence
Site category	Iron Age
Site location	**Site co-ordinates** East/LON/X: -23.6796 South/LAT/Y: 27.4758 The site is located in the opencast pit footprint.
Context	Secondary
Cultural affinities	Unknown
Age	Iron Age
Significant features	Animal burrows
Site extent and orientation	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment found near animal burrows
Stratification	None
Past environment information	This may be associated with Site S.35-004 as a farm road appears to have been routed through the site.
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	

Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Ceramics	
A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-7: General view of Site S.35-005 showing an animal burrow

Figure 10-8: A single, isolated occurrence of an undiagnostic potsherd ceramic fragment noted at Site S.35-005

10.4 EXX564/2327CB/S.35-006 (Isolated Stone Age/Iron Age occurrence)

Two ceramic fragments and a Stone Age artefact were noted next to a farm road in a clearing about 10 m x 10 m. The ceramics included a single undiagnostic potsherd ceramic fragment and a single diagnostic rim fragment. The Stone Age artefact included a single MSA quartzite flake. No other material culture or features were noted, nor any evidence of sub-surface deposit. However, it may be possible for this occurrence to be associated with S.35-004 and Site S.35-005 between approximately 200 m and 300 m to the north-west of S.35-006. The site is secondary so it may have washed down from S.35-004 and/or S.35-005, or transported by animal/human activity from any of the sites.

This site is located in the proposed opencast pit mining area.

Table 10-4: Summary of Site S.35-006

Site type	Isolated occurrence
Site category	Stone Age, Iron Age
Site location	**Site co-ordinates** East/LON/X: -23.6796 South/LAT/Y: 27.4778 The site is located in the opencast pit footprint. The site is situated near the farm boundary. A farm road lies directly adjacent to the opencast pit and to S.35-006.
Context	Secondary
Cultural affinities	Unknown
Age	MSA, Iron Age
Significant features	A scatter of ceramic fragments including one undiagnostic potsherd ceramic fragment and one diagnostic rim fragment, and one MSA quartzite flake found in a small clearing
Site extent and orientation	10 m x 10 m
Stratification	None
Past environment information	This may be associated with Site S.35-004 and Site S.35-005 as a farm road appears to have been routed through the site
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	

Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
A single MSA quartzite flake	
Ceramics	
A single undiagnostic potsherd ceramic fragment and a single diagnostic rim fragment possibly a bowl.	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-9: General view of Site S.35-006

Figure 10-10: A single undiagnostic potsherd ceramic fragment and a diagnostic rim fragment identified at Site S.35-006

Figure 10-11: A shale MSA flake identified at Site S.38-006

10.5 EXX564/2324CB/S.35-007 (Isolated Stone Age occurrence)

Site S.35-007 represents a single, isolated occurrence of a MSA quartzite flake. The artefact was found near a narrow erosion gully. No other material culture or features were noted that might provide any further context to the site. No evidence of archaeological deposit was noted in the erosion gully.

This site is located in the proposed opencast pit mining area.

Table 10-5: Summary of Site S.35-007

Site type	Isolated occurrence
Site category	Stone Age
Site location	**Site co-ordinates** East/LON/X: -23.6843 South/LAT/Y: 27.4796 The site is located in the opencast pit footprint.

Context	Secondary
Cultural affinities	Unknown
Age	MSA
Significant features	Erosion gully ± 20 m away
Site extent and orientation	A single MSA flake
Stratification	None
Past environment information	The erosion gully may have exposed sub-surface MSA material
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
A single, isolated occurrence of a MSA quartzite flake.	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-12: General view of Site S.35-007 along an erosion gully

Figure 10-13: A single, isolated occurrence of a MSA quartzite flake noted at Site S.35-007

10.6 EXX564/2327CB/S.35-008 (Isolated Stone age occurrence)

Site S.35-008 represents an occurrence of one MSA hornfel flake and one MSA quartzite discoidal core. These two MSA stone artefacts were found in a small pan about 10 m x 10 m. No other material culture or features were noted that might provide any further context to the site.

This site is located in the proposed opencast pit mining area.

Table 10-6: Summary of Site S.35-008

Site type	Single occurrence
Site category	Stone Age
Site location	**Site co-ordinates** East/LON/X: -23.6896 South/LAT/Y: 27.4815 The site is located in the opencast pit footprint.
Context	Secondary
Cultural affinities	Unknown
Age	MSA
Significant features	Pan
Site extent and orientation	10 m x 10 m
Stratification	None
Past environment information	MSA stone artefacts are usually found near pans
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
One MSA hornfel flake with retouch and one MSA quartzite discoidal core.	

Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-14: General view of Site S.35-008

Figure 10-15: One MSA hornfel flake and one MSA quartzite discoidal core noted at Site S.35-008

10.7 EXX564/2327CB/S.35-009 (Isolated Stone Age occurrence)

Site S.35-009 represents a single, isolated occurrence of a MSA quartzite flake. The artefact was found near a small pan about 10 m x 10 m. No other material culture or features were noted that might provide any further context to the site.

This site is located in the proposed opencast pit mining area.

Table 10-7: Summary of Site S.35-009

Site type	Isolated occurrence
Site category	Stone Age
Site location	**Site co-ordinates** East/LON/X: -23.6883 South/LAT/Y: 27.4806 The site is located in the opencast pit footprint.

Context	Secondary
Cultural affinities	Unknown
Age	MSA
Significant features	Pan
Site extent and orientation	10 m x 10 m
Stratification	None
Past environment information	MSA stone artefacts are usually found near pans.
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
One MSA quartzite flake	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-16: A single, isolated occurrence of a MSA quartzite flake noted at Site S.35-009

10.8 EXX564/2327CB/S.35-010 (Isolated Stone Age occurrence)

Site S.35-010 represents a single, isolated occurrence of a MSA quartzite flake. The artefact was found near a small pan about 10 m x 10 m. No other material culture or features were noted that might provide any further context to the site.

This site is located in the proposed discard dump area.

Table 10-8: Summary of Site S.35-010

Site type	Isolated occurrence
Site category	Stone Age
Site location	**Site co-ordinates** East/LON/X: -23.6983 South/LAT/Y: 27.4772 The site is located in the discard dump footprint.

Context	Secondary
Cultural affinities	Unknown
Age	MSA
Significant features	Pan
Site extent and orientation	10 m x 10 m
Stratification	None
Past environment information	MSA stone artefacts are usually found near pans
Threats or sources of risk	
The construction of the discard dump will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
One MSA quartzite flake	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-17: A single, occurrence of a MSA quartzite flake noted at Site S.35-010

10.9 EXX564/2327CB/S.35-011 (Isolated Stone Age occurrence)

Site S.35-011 represents a single occurrence of one MSA shale flake and one MSA quartzite core. These two MSA stone artefacts were found in a small pan about 5 m x 5 m. No other material culture or features were noted that might provide any further context to the site.

This site is located in the proposed discard dump area.

Table 10-9: Summary of Site S.35-011

Site type	Single occurrence
Site category	Stone Age
Site location	**Site co-ordinates** East/LON/X: -23.7014 South/LAT/Y: 27.4775 The site is located in the discard dump footprint.
Context	Secondary
Cultural affinities	Unknown

Age	MSA
Significant features	Pan
Site extent and orientation	5 m x 5 m
Stratification	None
Past environment information	MSA stone artefacts are usually found near pans
Threats or sources of risk	
The construction of the discard dump will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
One MSA shale artefact and one MSA quartzite core.	
Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-18: One MSA shale flake and one MSA quartzite core noted at Site S.35-011. Base scale in centimetres

10.10 EXX564/2327CB/S.35-012 (Isolated Stone Age occurrence)

Site S.35-012 represents a single, isolated occurrence of a MSA quartzite flake. The lithic may be associated with animal burrows in the immediate vicinity. No other material culture or features were noted that might provide any further context to the site. No evidence of archaeological deposit was noted in any of the burrows.

This site is located in the proposed opencast pit mining area.

Table 10-10: Summary of Site S.35-012

Site type	Isolated occurrence
Site category	Stone Age

Site location	**Site co-ordinates** East/LON/X: -23.7033 South/LAT/Y: 27.4929 The site is located in the opencast pit footprint. The site is situated near the farm boundary. A farm road lies directly adjacent to the opencast pit and to S.35-012.
Context	Secondary
Cultural affinities	Unknown
Age	MSA
Significant features	Animal burrows
Site extent and orientation	One MSA stone artefact
Stratification	None
Past environment information	Animal burrows may have resulted in exposure of sub-surface archaeology material
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
One MSA quartzite artefact	

Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-19: A single, isolated occurrence of a MSA quartzite flake noted at Site S.35-012. Base scale in centimetres

10.11 EXX564/2327CB/S.35-013 (Stone Age open scatter)

According to Pistorius (2010) a scatter of stone tools was recorded on the border between McCabesvley 311 LQ and Leeuwdriftt 312 LQ.

This site is located outside of the proposed opencast pit mining area.

Table 10-11: Summary of Site S.35-013

Site type	Open scatter
Site category	Stone Age

Site location	**Site co-ordinates** East/LON/X: -23.6513 South/LAT/Y: 27.4781 The site is located outside of the opencast pit footprint.
Context	Secondary
Cultural affinities	Unknown
Age	MSA; LSA
Significant features	Possible pan
Site extent and orientation	Scatter of MSA and LSA stone artefacts
Stratification	None
Past environment information	MSA and LSA stone artefacts are usually found near pans. The stone tools scatters found by Pistorius (2010) may have been near a pan
Threats or sources of risk	
The construction of the opencast pit may destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of Artefacts, Faunal, Botanical or Other Finds and Features	
Lithics	
The artefacts are crude and do not belong to common types usually used to classify MSA or LSA artefacts. Artefacts recorded by Pistorius (2010), are suggested to be cores, scrapers and a possible point.	

Statement of Value	**Field rating: Grade IV C** The site/resource value was considered negligible in terms of importance and integrity. The rating was informed by credible information sources such as peer reviewed publications and other impact assessment reports, which indicate that isolated occurrences of ceramics such as this are widespread in the region and of no information potential. No site context could be established and nearby animal burrows did not expose any other material culture or archaeological deposit. In addition single occurrences such as represented by this site are furthermore inherently without site integrity. No project-related mitigation measures such as changes to design or mine plan was considered necessary. However, the ECO should be present on site when initial ground clearing takes place to monitor any potential subsurface exposure of material culture. No site mitigation was considered necessary.

Figure 10-20: General view of Site S.35-013

Figure 10-21: A few stone tools identified at Site S35-013. The three large artefacts in the top row and the two in the bottom row (left and middle) seem to be cores. The artefact on the right may be a point. The artefacts in the middle row look like scrapers (Pistorius, 2010)

11 DESCRIPTION OF BUILT ENVIRONMENT RESOURCES

11.1 EXX564/2327CB/S.34-001 (Single building)

This single storey dwelling was also noted in a 1969 historical aerial photograph and subsequently recorded on Vaalpensloop 313 LQ Portion 1. A 'Grondbrief' or Deed of Sale dating to 1960 suggests that this dwelling may be 50 years or older. Today, this building is the original farmhouse of the property.

This site is located in the proposed opencast pit mining area.

Table 11-1: Summary of Site S.34-001

Site type	Single building
Site category	Residential

Site location	**Site co-ordinates** East/LON/X: -23.6864 South/LAT/Y: 27.4736 The site is located in the opencast pit footprint.
Context	Situated between two cleared fields that date to the 1960s
Age	Based on the Deed that was found in the archival research, this building may have been built in the 1960s
Significant features	Gables present on roof
Site extent	15 m x 10 m
Threats or sources of risk	
The construction of the opencast pit will destroy the site. In addition, any removal of vegetation and ground clearing may expose more extensive deposit potentially existing subsurface.	
Description of artefacts present	
General farm implements (currently occupied)	
Description of objects present	
Metal window frames and door frames. Wooden door, new industrial plastic tank installed outside the structure.	
Description of structure present	
15 m x 10 m residential structure with small addition on the side.	
Description of features present	
Gables present (three tier gable)	
Condition of site	
Currently occupied	

Statement of Value	**Field rating: Grade IV A** The credibility of S.34-001 is based on highly credible information sources such as peer reviewed publications. The authenticity of this heritage resource is merely evident as its importance is illustrated in credible information sources. This resource was given a medium heritage value. The exact age of the site must first be determined and a conservation/historical architect opinion may be required. This could result in possible re-evaluation of significance. If the site is not 60 years or older, then it may not need to be assessed by the impact rating system.

Figure 11-1: General view of Site S.34-001

Figure 11-2: Gables and modern fitments (water tank) at Site S.34-001

11.2 EXX564/2327CB/S.34-014 (Single building)

At least one historical house was recorded on Jackhalsvley 309 LQ during a survey conducted by Pistorius (2010). This residence was constructed with clay bricks and is fitted with a low pitched corrugated iron roof (Pistorius, 2010).

This site is located in the proposed underground mine development area.

Table 11-2: Summary of Site S.34-014

Site type	Historical house
Site category	Residential
Site location	The site is located in the underground mine footprint.
Context	Situated on Jackhalsvley 309 LQ
Age	1930 - 1940

Significant features	Constructed with clay bricks and white washed. It was fitted with a low pitched corrugated iron roof.
Site extent	Approximately 15 m x 10 m
Threats or sources of risk	
Activities associated with infrastructure construction of the underground mine may cause the alteration and/or destruction of the site.	
Description of artefacts present	
General farm implements (currently occupied)	
Description of objects present	
A low pitched corrugated iron roof, metal window frames and door frames, wood door, fence	
Description of structure present	
An approximately 15 m x 10 m residential structure constructed with clay bricks and white washed.	
Condition of site	
Currently occupied	
Statement of Value	**Field rating: Grade IV B** The credibility of this information is based on secondary and tertiary information sources and individual opinions. This resource is given a low heritage value.

Figure 11-3: General view of Site S.34-014 (Pistorius, 2010)

12 DESCRIPTION OF BURIAL GROUNDS AND GRAVES

12.1 EXX564/2327CB/S.36-002 (Formal burial ground)

A burial ground was recorded in an abandoned field. At least seven graves were noted containing a total of seven graves approximately 20 m x 10 m in extent. The graves range from being formal graves with concrete or granite headstones to informal soil mounds or stone-packed graves with grave markers (metal signs). The burial ground is generally maintained and there are a number of grave goods present. The grave goods include a glass cup, rocks, a metal cup, and a glass bottle. The burial ground is probably associated with farm workers of who worked on the farm from the late 1950s to the 1990s.

This site is located in the proposed opencast pit mining area.

Table 12-1: Summary of Site S.36-002

Context	Formal burial ground, primary context
Site location	**Site co-ordinates** East/LON/X: -23.6864 South/LAT/Y: 27.4736 The site is located in the opencast pit footprint.
Physical description	Seven graves present, 20 m x 10 m in extent
Condition	Generally maintained
Age	Dating from 1959 to 1990
Possible Affinity	Possible affinity with local community and/or farm workers
Persons consulted	None
Threats or sources of risk and legal implications	
■ Immediate threats include site clearance for development such as the opencast pit. ■ Potential sources of threats and risk include vandalism by workers on site, accidental destruction or alteration of burial site by construction workers on site. ■ Legal implications based on Section 36 of the NHRA and Regulations Chapter XI (Sections 38-40), consultation with affected families and permit application for possible grave relocation.	
Statement of Value	**Field rating: Grade IV A** The site/resource value was considered medium in terms of importance and integrity. The rating was informed by highly credible information sources primary sources and verified oral accounts. Site context was in an excellent condition and the site was well-preserved with little to no decay present and little restoration required. No project-related mitigation measures such as changes to design or mine plan was considered as the burial ground is located in the opencast pit and will never be preserved. It is therefore recommended that mitigation measures include grave relocation.

Figure 12-1: General view of Site S.36-002

Figure 12-2: Plastic water bottles hanging off wooden posts and the tree in the burial ground

12.2 EXX564/2327CB/S.36-002/1 (Informal grave)

A single, informal stone-packed child's burial with a grave marker was recorded in burial ground S.36-002. The inscription on the grave marker indicates that the grave dates to 1959. The grave marker is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-2: Summary of S.36-002/1

Context	Primary context
Type	Informal burial
Dimensions	0.5 m x 1 m
Orientation	East
Condition	Good condition
Dressing	Stone-packed with a grave marker
Inscriptions / identifying features (verbatim copy)	"MJ SMITH PAPANA 1955/02/27 DIED IN MJ 1959/08/30 PLACE VAALPENCE"
Age	1959 (53 years old)
Possible affinity	Historical farm labour or occupants
Persons consulted	None

Figure 12-3: General view of grave S.36-002/1

Figure 12-4: Detail of the relatively recent and well-maintained grave marker of grave S.36-002/1

12.3 EXX564/2327CB/S.36-002/2 (Informal grave)

A single, informal stone-packed child's burial was recorded in burial ground S.36-002.

This site is located in the proposed opencast pit mining area.

Table 12-3: Summary of Grave S.36-002/2

Context	Primary context
Type	Informal burial
Dimensions	0.5 m x 1 m
Orientation	East
Condition	Good condition
Dressing	Stone-packed

Inscriptions / identifying features (verbatim copy)	None
Age	Unknown
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

Figure 12-5: General view of grave S.36-002/2

12.4 EXX564/2327CB/S.36-002/3 (Formal grave)

A single, formal burial with a headstone was recorded in burial ground S.36-002. The inscription on the headstone indicates that the grave dates to 1960. The headstone is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-4: Summary of S.36-002/3

Context	Primary context
Type	Formal burial
Dimensions	1 m x 3 m
Orientation	East
Condition	Good condition
Dressing	Concrete slab frame with stone packing and cement headstone
Inscriptions / identifying features (verbatim copy)	“MOPHUTIN S. KLAAS TIBANYANE 1934/12/09 1960/04/09”
Age	1960 (52 years old)
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

Figure 12-6: General view of grave S.36-002/3

Figure 12-7: The cement headstone of grave S.36-002/3

12.5 EXX564/2327CB/S.36-002/4 (Formal grave)

A single, formal adult burial with a granite headstone was recorded in burial ground S.36-002. The inscription on the granite headstone indicates that the grave dates to 1980. The headstone is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-5: Summary of S.36-002/4

Context	Primary context
Type	Formal burial
Dimensions	1 m x 3 m
Orientation	East
Condition	Good condition
Dressing	Concrete slab and engraved polished granite headstone
Inscriptions / identifying features (verbatim copy)	“MESHARK TIBANYANE 4.11.1919 12.4.1980 ROBALA KA KAGISO”
Age	1980 (32 years old)
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

Figure 12-8: General view of grave S.36-002/4

Figure 12-9: The engraved granite headstone of grave S.36-002/4

12.6 EXX564/2327CB/S.36-002/5 (Formal grave)

A single, formal adult burial with a concrete headstone was recorded in burial ground S.36-002. The inscription on the concrete headstone indicates that the grave dates to 1984. The headstone is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-6: Summary of S.36-002/5

Context	Primary context
Type	Formal burial
Dimensions	1 m x 3 m
Orientation	East
Condition	Good condition

Dressing	Concrete slab with concrete headstone with mosaic tile inlay
Inscriptions / identifying features (verbatim copy)	“IN LOVING MEMORY OF NTLAKALA STEPHINA SERUMULA 1919 – 1984-9-26 FROM YOUR FAMILY REST IN PEACE”
Age	1984 (28 years old)
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

Figure 12-10: General view of grave S.36-002/5

Figure 12-11: The cement headstone with tile inlay of grave S.36-002/5

12.7 EXX564/2327CB/S.36-002/6 (Informal grave)

A single, informal adult burial with a grave marker was recorded in burial ground S.36-002. The inscription on the grave marker indicates that the grave dates to 1985. The grave marker is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-7: Summary of S.36-002/6

Context	Primary context
Type	Informal burial
Dimensions	1 m x 3 m
Orientation	East
Condition	Good condition

Dressing	Soil mound with a grave marker, rocks and a metal cup under the grave marker with a glass bottle hanging from the grave marker
Inscriptions / identifying features (verbatim copy)	“LOTTA TIBYANANE DATE OF BIRTH 1932 DATE OF DEATH 1985-1-16 PLACE: VALPENSLOOP”
Age	1985 (27 years old)
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

Figure 12-12: General view of grave S.36-002/6

Figure 12-13: The grave marker of grave S.36-002/6

12.8 EXX564/2327CB/S.36-002/7 (Informal grave)

A single, informal adult burial with a grave marker was recorded in burial ground S.36-002. The inscription on the grave marker indicates that the grave dates to 1990. The grave marker is of relatively recent date and seems well-maintained, indicating relatively recent visits by descendants.

This site is located in the proposed opencast pit mining area.

Table 12-8: Summary of S.36-002/7

Context	Primary context
Type	Informal burial
Dimensions	1 m x 3 m
Orientation	East
Condition	Good condition

Dressing	Soil mound with a grave marker
Inscriptions / identifying features (verbatim copy)	“DABEER TIBYANANE BIRTH: 1916 DEATH: 1990 PLACE: VALPENSLOOP”
Age	1990 (22 years old)
Possible affinity	Possible affinity with local community and/or farm workers
Persons consulted	None

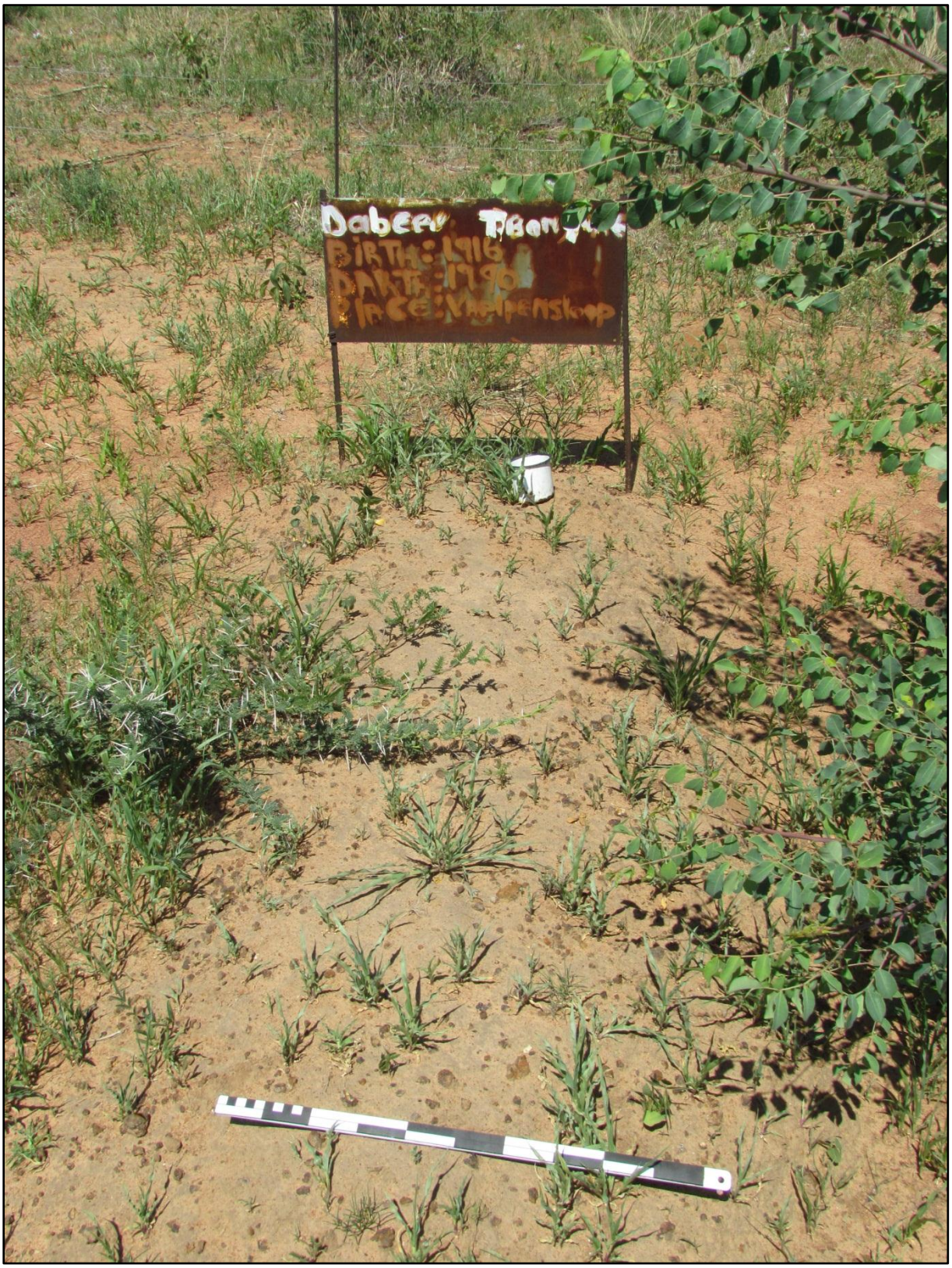

Figure 12-14: General view of grave S.36-002/7

Figure 12-15: The grave marker of grave S.36-002/7

12.9 EXX564/2327CB/S.36-015 (Formal grave)

A single, formal grave was recorded on Jackhalsvley 309 LQ by Pistorius (2010). According to Pistorius (2010), this grave is associated with the remains of a demolished farmstead. The grave is located next to a tree and is covered with stones (Pistorius, 2010). It is fitted with an iron cross which also serves as a grave marker. The name of the deceased is written on the cross.

This site is located in the proposed underground mine development area.

Table 12-9: Summary of Site S.36-015

Context	Primary context
Site location	**Site co-ordinates** East/LON/X: -23.6680 South/LAT/Y: 27.4729 The site is located in the underground mine footprint.

Type	Formal burial
Dimensions	Unknown
Orientation	Unknown
Condition	Good condition
Dressing	Three rocks serve as stone dressing with an iron cross (Pistorius, 2010) as a grave marker
Inscriptions / identifying features (verbatim copy)	“SEMENSON GWANE”
Age	Unknown
Possible Affinity	Associated with the remains of a demolished farmstead (Pistorius, 2010)
Persons consulted	None
Threats or sources of risk and Legal Implications	
■ Immediate threats include site clearance for development such as the open cast pit. ■ Potential sources of threats and risk include vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site. ■ Legal implications based on Section 36 of the NHRA and Regulations Chapter XI (Section 38-40), consultation with affected families and permit application for possible grave relocation.	
Statement of Value	**Field rating: Grade IV A** The site/resource value was considered medium in terms of importance and integrity. The rating was informed by highly credible information sources primary sources and verified oral accounts. Site context was in an excellent condition and the site was well-preserved with little to no decay present and little restoration required. Project-related mitigation measures such as changes to design or mine plan were considered necessary. It was also recommended that the grave be demarcated by fencing to make it visible and to minimise the potential for accidental damage. In addition, access to the burial ground must be granted to families and descendants of the deceased.

Figure 12-16: General view of grave S.36-015 (Pistorius, 2010)

13 STATEMENT OF SIGNIFICANCE/HERITAGE VALUE

Table 13-1: Criteria used to determine value and significance of heritage resources, Section 3 NHRA

NHRA reference	Description of defining criteria
3(1)(a)	its importance in the community, or pattern of South Africa's history;
3(1)(b)	its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
3(1)(c)	its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3(1)(d)	its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
3(1)(e)	its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
3(1)(f)	its importance in demonstrating a high degree of creative or technical achievement at a particular period;
3(1)(g)	its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
3(1)(h)	its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
3(1)(i)	sites of significance relating to the history of slavery in South Africa.

Table 13-2: Proposed field ratings/grades describing value and significance of heritage resources of tangible heritage resources, based on Section 7(1) NHRA SAHRA Minimum Standards (2006)

FR/Grade	Significance	Mitigation recommendation
National and Provincial Protection, NHRA 7(1)(a, b)		
I	National SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended.
II	Provincial SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended.
Local Protection, NHRA 7(1)(c)		
IIIA	Local PHRA responsibility High significance	Retained as heritage register site; Mitigation as part of development not advised.
IIIB	Local PRHA responsibility High significance	Could be mitigated and part retained as heritage register site.
General Protection, NHRA 7(1)(c)		
IV A	Local PRHA responsibility High/Medium significance	Heritage resource should be mitigated before destruction.
IV B	Local PRHA responsibility Medium significance	Heritage resource should be recorded before destruction.
IV C	Local PRHA responsibility Low significance	Heritage resource has been sufficiently recorded requiring no further recording before destruction.

Table 13-3: The value of the heritage resources identified within the Thabametsi Project area during the field survey

Heritage Resource, Activity Type, Development Phase and Aspect			STATEMENT OF SIGNIFICANCE / VALUE											
			Importance									Value Rating		
Resource ID	Description	Source of Risk	Artistic		Historic			Scientific			Social	Credibility	AUTHENTICITY	INTEGRITY	VALUE
			1	2	3	4	5	6	7	8	9				
S.35-003	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	Underground mine	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-004	Six undiagnostic potsherd ceramic fragments, one diagnostic rim fragment, and one lower grindstone fragment.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	1	4
S.35-005	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-006	A scatter of ceramic fragments including a single undiagnostic potsherd ceramic fragment and a single rim fragment, and a MSA quartzite flake.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-007	A single, isolated occurrence of a MSA quartzite flake.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-008	One MSA hornfel flake and one MSA quartzite discoidal core.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-009	A single, isolated occurrence of a MSA quartzite flake.	Opencast pit	0	1	0	0	0	0	1	0	0	3	4	0	0
S.35-010	A single, isolated occurrence of a MSA quartzite flake.	Discard dump	0	1	0	0	0	0	1	0	0	2	3	0	0
S.35-011	A single occurrence of one MSA shale flake and one MSA quartzite core.	Discard dump	0	1	0	0	0	0	1	0	0	2	3	0	0
S.35-012	A single, isolated occurrence of a MSA quartzite flake.	Opencast pit	0	1	0	0	0	0	1	0	0	2	3	0	0
S.35-013	Stone tool scatter on border of Leeupoort 312 LQ and McCabesvley 311 LQ	Opencast pit	0	1	0	0	0	0	1	0	0	2	3	0	0
S.34-001	A historical house with gables. This house was noted in a 1969 historical aerial photograph. A Deed of Sale dating to 1960 suggests that the structure is older than 50 years.	Opencast pit	1	1	1	0	2	1	2	1	1	3	8	1	8
S.34-014	A historical house with clay bricks and a low pitched corrugated iron roof on Jackhalsvley 309 LQ.	Underground mine	1	1	1	0	0	0	1	0	0	1	3	2	6

Heritage Resource, Activity Type, Development Phase and Aspect			STATEMENT OF SIGNIFICANCE / VALUE												
			Importance										Value Rating		
Resource ID	Description	Source of Risk	Artistic		Historic			Scientific			Social	Credibility	AUTHENTICITY	INTEGRITY	VALUE
			1	2	3	4	5	6	7	8	9				
S.36-002/1	A single stone-packed child's burial dating to 1959.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/2	A single stone-packed child's burial.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/3	A formal burial with a headstone dating to 1960.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/4	A formal adult burial with a granite headstone dating to 1980.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/5	A formal adult burial with a concrete headstone dating to 1984.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/6	An informal adult burial with a grave marker dating to 1985.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-002/7	An informal adult burial with a grave marker dating to 1990.	Opencast pit	0	0	3	0	0	0	3	0	3	3	9	1	9
S.36-015	A single grave on Jackhalsvley 309 LQ.	Underground mine	0	0	3	0	0	0	1	0	3	3	8	1	8

14 DISCUSSION OF RESULTS AND FINDINGS

From the research conducted on the Lephalale area through archival sources and published documents, one can deduce that a great deal of cultural heritage exists along the Limpopo River in this area of South Africa. Much of the cultural heritage has previously remained understudied; however, current development in the area has resulted in identification of heritage resources that may contribute to current information in the region.

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 Spatial Development Framework (SDF) and Integrated Development Plans (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.

The immediate receiving environment which includes the open caste mine, the underground mine and associated infrastructure, is currently undeveloped in the sense that there are limited residential structures and no commercial or industrial structures. Structures that fall within legal parameters to be considered heritage resources include historical houses and farmsteads.

Topographical features such as outcrops, riverbeds, road cuttings and cliffs are commonly used in palaeontological assessments to identify visible palaeontological features. The landscape within the Thabametsi Project area is flat with no outcrops, riverbeds, road cuttings or cliffs and therefore no visible palaeontological features could be identified. Although the geological formations in the area are known to be fossiliferous elsewhere in South Africa, the known fossil heritage of the Thabametsi Project area may only be determined through excavations or chance finds.

Reconnaissance included pedestrian and vehicle survey. A review of previously identified sites was also completed, to verify sites and determine extent of sites. Identified sites are summarised in Table 13-3 on Page 100. For a list of the field rating thresholds and descriptions see Table 13-2 on Page 99. All recorded heritage points are presented in Plan 5 in Appendix B: Location and Site Maps.

14.1 Opencast Pit

The proposed opencast pits will be constructed on Zaagput 307 LQ, Van Der Waltspan 310 LQ, McCabesvley 311 LQ, and Vaalpensloop 313 LQ. Currently, the proposed opencast pit area is undeveloped with the land being used for agriculture and as hunting and

game farms. Although numerous find spots were recorded, few archaeological and historical sites were found. This may be a result of previous farming activities such as site clearing which may have resulted in the alteration and destruction of archaeological and historical sites. The two large fields on Vaalpensloop 313 LQ Remaining Extent, for example, represent an area where sites would have been disturbed due to the clearance of those areas. The two fields are present on the 1969 photograph indicating farming activities within the project area for the past 43 years.

The MSA is represented by find spots consisting of quartzite and shale flakes found near animal burrows and on the surface of pans with no primary site context. It is expected that more similar finds may occur across the Thabametsi Project area where suitable rock outcrops may occur. However, it is not expected that large numbers of these primarily MSA tools will exist as the general nature of the area is not suitable for permanent occupation for MSA or LSA hunter-gatherer groups.

The Iron Age heritage resources within the project area include find spots consisting of undiagnostic potsherds found near animal burrows with no primary site context. Other Iron Age sites include open scatters of undiagnostic and diagnostic potsherd ceramic fragments with associated lower grinding stone fragments indicating previous settlement. With reference to the background literature review on the area, these sites are consistent with the ethnography which indicated that small groups of individuals were moving across the landscape without creating long-term settlements due to the political instability of the region.

The historical structure S.34-001 is present on aerial photography of the area dating to 1969. The burials grounds within the project area date from 1959-1990 indicating that there has been a historical social connection to the land for approximately the past 53 years. There may still be a connection to the land as the historical structure is currently occupied and the burial ground has been maintained.

The archaeological and historical sites identified within the proposed opencast mine footprint will be impacted upon during the construction phase of the proposed opencast mine.

14.2 Underground Mine

The archaeological and historical heritage resources located within the proposed underground mine area include Iron Age find spots, a historical house, and a single grave. Potential impacts and sources of threats and risk are limited to the infrastructure footprints such shafts. Mitigation measures may therefore limit or reduce the impact on heritage resources during the construction and operational phases of the proposed underground mine. However, depending on the depth of the proposed underground mine, subsidence may affect above ground structures and sites such as historical buildings and burial grounds.

15 RECOMMENDATIONS

15.1 Impact Assessment

The section aims to assess the significance of the potential impacts (threats or sources of risk) on heritage resources in the proposed project area. The impact assessment (Table 15-1) was completed in compliance with the impact assessment criteria implemented for the EIA report as well as the significance ratings and archaeological impact assessment criteria established by the ASAPA and applicable international best practice guidelines. More information on the archaeological impact assessment criteria and rating used in this study and details on the weight assigned to the various parameters for positive and negative impacts in the formula are presented in Appendix B: Location and Site Maps.

15.2 Mitigation

Mitigation measures fall in two categories: project-related mitigation and mitigation of sites/heritage resources.

Project-related mitigation: impacts on heritage resources may be avoided or reduced through the implementation of feasible mitigation measures related to the project design and planning. For instance, an historical building may be preserved *in situ* by changing infrastructure footprints.

Mitigation of heritage resources: where project-related mitigation does not reduce of remove impacts on a heritage resource, the resource itself may require mitigation. For example, any resource located in the open-cast pit area will inevitably be destroyed, irrespective of any project-related mitigation measures as the pit cannot be moved. Depending on the value of a resource (field rating/grading) certain prescribed site mitigation measures must then be implemented. This could include:

- *Site preservation*: Conservation is essentially a no-development recommendation and may be achieved through appropriate project-related mitigation;
- *Site mitigation*: Site conservation (no-development in the particular area) or Phase 2 mitigation (Shovel Test Pits (STPs)) after which development may legally proceed in the area; and
- *Site destruction*: If a particular identified resource is of little archaeological or cultural heritage significance, a recommendation of site destruction will be made by an accredited archaeologist. A site destruction recommendation essentially implies that the site may be destroyed during the course of development without the developer having to comply with any archaeological or cultural heritage requirements.

15.3 Detailed Recommendations with Regard to Archaeological and Historical Resources and Built Environment Resources

15.3.1 Recommendations for mitigation of heritage resources

For the Thabametsi Project, it is recommended that the following sites undergo mitigation:

- S.34-001: a historical house on Vaalpensloop 313 LQ Remaining Extent. The house falls within the proposed opencast footprint area and will inevitably be destroyed, irrespective of any project-related mitigation measures as the opencast pit cannot be moved. It is therefore recommended that the site undergo Phase 2 mitigation after which the development may legally proceed.

  S.35-004: Six undiagnostic potsherd ceramic fragments, one diagnostic rim fragment, and one lower grindstone fragment on Vaalpensloop 313 LQ Remaining Extent. The site falls within the proposed opencast footprint area and will inevitably by destroyed, irrespective of any project-related mitigation measures as the opencast pit cannot be moved. It is therefore recommended that the site undergo Phase 2 mitigation after which development may legally proceed.

15.3.2 Recommendations for destruction

The remaining sites (archaeological, heritage and built environment resources) were sufficiently recorded and do not require project-related mitigation nor site mitigation.

15.4 Detailed Recommendations with Regard to Burial Grounds and Graves

15.4.1 Recommendations for relocation of graves

A single burial ground consisting of seven formal and informal graves and associated grave goods dating to between 1959 and 1990 was identified during the survey on Vaalpensloop 313 LQ Remaining Extent. The burial ground was identified on the proposed opencast pit development footprint and will therefore be impacted on. The immediate threats include site clearance for development. Potential sources of threats and risk include vandalism by workers on site and/or accidental destruction or alteration of the burial ground by construction workers on site.

According to the NHRA Section 36, no person may destroy, damage, alter, exhume or remove a grave or burial ground without a permit from SAHRA. SAHRA may only issue a permit for the destruction of the burial ground if the applicant has made arrangement for the exhumation and re-interment of the contents of the graves, to the cost of the applicant.

Based on the potential sources of threats or risk, it is recommended that the burial ground be mitigated before destruction. In terms of the NHRA Section 36, the mitigation measures recommended include grave relocation with consultation with affected families.

15.4.2 Recommendations for protection during development and long term

Grave S.36-015 is located in the proposed underground mine development area on Jackhalsvley 309 LQ. Impacts on this heritage resource may be avoided though the implementation of feasible mitigation measures related to project design and planning. The grave may therefore be preserved *in situ* by changing infrastructure footprints. It is further recommended that the grave be demarcated by fencing to make it visible and to minimise the potential for accidental damage. In addition, access to the burial ground must be granted to families and descendants of the deceased.

15.5 Site Specific Recommendations

15.5.1 Low significance

Sites S.35-004 and S.34-014 are heritage resources that are of low heritage value. S.35-004 comprises six undiagnostic potsherd ceramic fragments, one diagnostic rim fragment, and one lower grindstone fragment. This resource was given a low heritage value because it represented an open scatter that is poorly preserved and with little information potential. It is recommended that this resource be recorded before destruction.

S.34-014 is a historical house with clay bricks and a low pitched corrugated iron roof on Jackhalsvley 309 LQ (Pistorius, 2010). It is recommended that built structure be mapped, documented and then destroyed.

A destruction permit must be applied for from the relevant HRA before any further alteration at the site takes place.

15.5.2 Medium significance

The historical house with gables at Site 34-001 on Vaalpensloop 313 LQ Remaining Extent is a heritage resource that is of medium heritage value. However, the exact age of the historical house must first be determined and a conservation or historical architect opinion may be required for this. This could result in the possible re-evaluation of significance. However, if the site is not 60 years or older then it may not need to be assessed by the impact rating system.

15.6 Detailed Recommendations with Regard to Paleontological Resources

Topographical features such as outcrops, riverbeds, road cuttings and cliffs are commonly used in palaeontological assessments to identify visible palaeontological features. The landscape within the Thabametsi Project area is flat with no outcrops, riverbeds, road cuttings or cliffs and therefore no visible palaeontological features could be identified. Although the geological formations in the area are known to be fossiliferous elsewhere in South Africa, the known fossil heritage of the Thabametsi Project area may only be

determined through excavations or chance finds. It is therefore recommended that Chance Find and Fossil Find Procedures and a Fossil Monitoring Program be implemented.

For a detailed description of these procedures see Appendix D: Chance Find Procedures, Fossil Find Procedures and Fossil Monitoring.

Table 15-1: Impact Assessment

Heritage Resource, Activity Type, Development Phase and Aspect						STATEMENT OF SIGNIFICANCE / VALUE			Impact Rating							Impact Rating (after project mitigation)							FIELD RATING	Recommended Heritage Mitigation
						Value Rating			Before project mitigation							After project mitigation								
Resource ID	Description	Activity	NHRA Trigger	Source of Risk	Impact	AUTHENTICITY	INTEGRITY	VALUE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE		
S.35-003	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	GNR545(5)	38(1)(c)(i)	Underground mine	Exposure of archaeological resources	4	0	0	-1	2	2	2	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-004	Six undiagnostic potsherd ceramic fragments, one diagnostic rim fragment, and one lower grindstone fragment.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	1	4	-1	3	3	3	2	2	4	1	0	0	0	0	0	0	Field Rating IV B - General	Record before destruction
S.35-005	A single, isolated occurrence of an undiagnostic potsherd ceramic fragment.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-006	A scatter of ceramic fragments including a single undiagnostic potsherd ceramic fragment and a single rim fragment, and a MSA quartzite flake.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-007	A single, isolated occurrence of a MSA quartzite flake.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-008	One MSA hornfel flake and one MSA quartzite discoidal core.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-009	A single, isolated occurrence of a MSA quartzite flake.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	4	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-010	A single, isolated occurrence of a MSA quartzite flake.	GNR545(5)	38(1)(c)(i)	Discard dump	Archaeological resources such as MSA lithics may be unintentionally covered	3	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation

Heritage Resource, Activity Type, Development Phase and Aspect						STATEMENT OF SIGNIFICANCE / VALUE			Impact Rating							Impact Rating (after project mitigation)							FIELD RATING	Recommended Heritage Mitigation
						Value Rating			Before project mitigation							After project mitigation								
Resource ID	Description	Activity	NHRA Trigger	Source of Risk	Impact	AUTHENTICITY	INTEGRITY	VALUE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE		
																								required
S.35-011	A single occurrence of one MSA shale flake and one MSA quartzite core.	GNR545(5)	38(1)(c)(i)	Discard dump	Archaeological resources such as MSA lithics may be unintentionally covered	3	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-012	A single, isolated occurrence of a MSA quartzite flake.	GNR545(5)	38(1)(c)(i)	Opencast pit	Exposure of and damage to archaeological resources	3	0	0	-1	3	3	3	0	2	0	1	1	2	2	0	2	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.35-013	Stone tool scatter on border of Leeupoort 312 LQ and McCabesvley 311 LQ	GNR545(5)	38(1)(c)(i)	Opencast pit	Alteration and/or destruction of sub-surface archaeological material	3	0	0	-1	1	2	1	0	1	0	1	1	1	1	0	1	0	Field Rating IV C - General	Sufficiently recorded; no further mitigation required
S.34-001	A historical house with gables. This house was noted in a 1969 historical aerial photograph. A Deed of Sale dating to 1960 suggests that the structure is older than 50 years.	GNR544(22)	38(1)(c)(i)	Opencast pit	Damage to structures that are over 60 years old; change of sense of place and landscape character	8	1	8	-1	3	3	3	4	1	4	1	1	1	1	1	1	1	Field Rating IV A - General	Mitigation before destruction
S.34-014	A historical house with clay bricks and a low pitched corrugated iron roof on Jackhalsvley 309 LQ.	GNR545(5)	38(1)(c)(i)	Undergrou nd mine	Damage to structures that are over 60 years old; change of sense of place and landscape character	3	2	6	-1	1	2	1	1	1	1	1	0	0	0	0	0	0	Field Rating IV B - General	Record before destruction

Heritage Resource, Activity Type, Development Phase and Aspect						STATEMENT OF SIGNIFICANCE / VALUE			Impact Rating							Impact Rating (after project mitigation)							FIELD RATING	Recommended Heritage Mitigation
						Value Rating			Before project mitigation							After project mitigation								
Resource ID	Description	Activity	NHRA Trigger	Source of Risk	Impact	AUTHENTICITY	INTEGRITY	VALUE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE		
S.36-002/1	A single stone-packed child's burial dating to 1959.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-002/2	A single stone-packed child's burial.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-002/3	A formal burial with a headstone dating to 1960.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-002/4	A formal adult burial with a granite headstone dating to 1980.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-002/5	A formal adult burial with a concrete headstone dating to 1984.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-002/6	An informal adult burial with a grave marker dating to 1985.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction

Heritage Resource, Activity Type, Development Phase and Aspect						STATEMENT OF SIGNIFICANCE / VALUE			Impact Rating							Impact Rating (after project mitigation)							FIELD RATING	Recommended Heritage Mitigation
						Value Rating			Before project mitigation							After project mitigation								
Resource ID	Description	Activity	NHRA Trigger	Source of Risk	Impact	AUTHENTICITY	INTEGRITY	VALUE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE	Nature of Change (1/-1)	Scale of Change	Duration of Change	Intensity of Change	Consequence	Probability	MAGNITUDE		
S.36-002/7	An informal adult burial with a grave marker dating to 1990.	GNR545(5)	38(1)(c)(i)	Opencast pit	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	9	1	9	-1	3	3	3	4	1	4	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction
S.36-015	A single grave on Jackhalsvley 309 LQ.	GNR545(5)	38(1)(c)(i)	Underground mine	Site clearance for development; vandalism by workers on site and accidental destruction or alteration of burial site by construction workers on site	8	1	8	-1	1	2	1	2	1	2	1	0	0	0	0	0	0	Field Rating IV A - General	Mitigation before destruction

16 CONCLUSION

Digby Wells has been requested by Exxaro to conduct an EIA in accordance with the MPRDA and NEMA processes for the Thabametsi Project. The EIA has been conducted for the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, McCabesvley 311 LQ, and Vaalpensloop 313 LQ.

Based on the BID, SAHRA stipulated that a HIA must be undertaken for the Thabametsi Project area. This report therefore constitutes the HIA component of the Final EIA Report.

This HIA has integrated the results from a previous Phase 1 HIA conducted by Pistorius in 2010 for Exxaro on the farms Zaagput 307 LQ, Jackhalsvley 309 LQ, Van Der Waltspan 310 LQ, and McCabesvley 311 LQ. The farm Vaalpensloop 313 LQ was not included in the original Phase 1 HIA conducted by Pistorius (2010) because it did not form part of the previous SoW. The current HIA has included the farm Vaalpensloop 313 LQ.

A total of 15 sites were identified and recorded during the vehicle and pedestrian survey. Sites of no to negligible heritage value include single, isolated occurrences of potsherd ceramic fragments and MSA stone flakes. S.35-003 and S.35-005 to S.35-013 were significantly recorded and no further mitigation is recommended.

A historical house with gables was identified on Vaalpensloop 313 LQ Remaining Extent. The historical house was identified on the proposed opencast pit development footprint and will therefore be impacted on. Activities associated with the construction and operation of the opencast mine could cause damage to structures that are over 60 years old: blasting may cause historical structures to be covered by dust, roads may be routed through historical sites causing damage to historical structures, the influx of people could result in vandalism and the possible destruction of structures older than 60 years, and the construction of the mine could change of sense of place and landscape character. Based on the sources of threats and risk, it is recommended that the site undergo Phase 2 mitigation after which development may legally proceed.

A single burial ground consisting of seven formal and informal graves and associated grave goods dating to between 1959 and 1990 was identified during the survey on Vaalpensloop 313 LQ Remaining Extent. The burial ground was identified on the proposed opencast pit development footprint and will therefore be impacted on. The immediate threats include site clearance for development. Potential sources of threats and risk include vandalism by workers on site and/or accidental destruction or alteration of the burial ground by construction workers on site. Based on the potential sources of threats or risk, it is recommended that the burial ground be mitigated before destruction. In terms of the NHRA Section 36, the mitigation measures recommended include grave relocation with consultation with affected families.

Although the geological formations in the area are known to fossiliferous elsewhere in South Africa, the known fossil heritage of the project area can only be determined through excavations. It is therefore recommended that the Chance Find and Fossil Find Procedures as well as a Fossil Monitoring program be implemented for the Thabametsi Project.

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Appendix A: Curriculum Vitae of Specialists

Appendix B: Location and Site Maps

Plan 1: Regional Location of Project, 1: 250 000

Plan 2: Regional Location of Project and Study Areas, 1: 50 000

Plan 3: Regional Location of Project and Study Areas, 1: 10 000

Plan 4: GPS track log, 1: 50 000

Plan 5: Position of sites in Project and Study Areas, 1: 10 000

Plan 6: Geological context of the Thabametsi project area 1:50 000

Appendix C: Impact Methodology and Assessment of Resource Significance/Value

Appendix D: Chance Find Procedures, Fossil Find Procedures and Fossil Monitoring

Appendix E: Registered Stakeholders

Appendix F: Heritage Statement