

PHASE 1 CULTURAL HERITAGE IMPACT ASSESSMENT REPORT

PROPOSED SOUTHERN GATEWAY RESIDENTIAL DEVELOPMENT POLOKWANE LOCAL MUNICIPALITY CAPRICORN DISTRICT LIMPOPO PROVINCE

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Executive Summary

This report addresses the development of the proposed Southern Gateway residential development located on the farm Sterkloop 688 LS. It consists of the Ivydale Agricultural Smallholdings numbers 78 – 82, about 2.6km south-west of the Polokwane CBD along the R101/N1.

No archaeological sites or material or graves and burial sites were observed in the project area.

There are structures older than 60 years on Smallholdings 80 and 81. Although not regarded as culturally significant due to alterations and neglect, these are provisionally protected by Section 34 of the National Heritage Resources Act and may not be demolished without a permit from the Limpopo Heritage Resources Authority (LIHRA).

It is recommended that:

- Phase 2 assessments be conducted for the two structures on smallholdings 80 & 81, which were identified as being 60 years or older;
- Based on the outcome of the Phase 2 assessments, permit applications be submitted to LIHRA for their demolition.

From a heritage management perspective there are no fatal flaws or key uncertainties and risks associated with the proposed development

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1. INTRODUCTION AND TERMS OF REFERENCE

1.1 Introduction

The author was contracted by EScience Associates (Pty) Ltd to undertake a Phase 1 Heritage Impact Assessment of the proposed Southern Gateway residential development. A desktop study and field survey was undertaken for the study.

1.2 Project location and description

The proposed development is located on the farm Sterkloop 688 LS. It consists of the Ivydale Agricultural Smallholdings numbers 78 – 82, about 2.6km south-west of the Polokwane CBD along the R101/N1 within the Polokwane Local Municipality in the Capricorn District. The proposed project aims to develop residential units on the property. It is located at general coordinates 23°55'35.18"S, 29°25'38.75"E (Figures 1 – 2).

1.3 Terms of reference and scope of work

Undertake a Heritage Impact Assessment and submit a specialist report, which addresses the following:

- A desktop and field assessment to gather information on Heritage resources within the proposed development site;
- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance; and
- Identifying key uncertainties and risks.

1.4 Terrain description

The property contains 4 homestead clusters, each consisting of numerous buildings/outbuildings. Large parts of the property have been ploughed for cultivation in the past. Typical of such agricultural smallholding, the property has a number of reservoirs/dams and weirs have been constructed to dam up the drainage line that runs through it. Uncontrolled dumping of mainly building rubble and garden rubbish covers large parts of the property.

The original vegetation type here is the Pietersburg false grassland, but the area is increasingly being pioneered by *Vachellia* (acacia) species due to past and present farming practices.

2. RELEVANT LEGISLATION

Two sets of legislation are relevant for this study with regard to the protection of heritage resources and graves.

2.1 The National Heritage Resources Act (25 of 1999) (NHRA)

This Act established the South African Heritage Resources Agency (SAHRA) and makes provision for the establishment of Provincial Heritage Resources Authorities (PHRA). The Act makes provision for the undertaking of heritage resources impact assessments for various categories of development as determined by Section 38. It also provides for the grading of heritage resources (Section 7) and the implementation of a three-tier level of responsibilities and functions for heritage resources to be undertaken by the State, Provincial authorities and Local authorities, depending on the grade of the Heritage resources (Section 8).

In terms of the National Heritage Resources Act (1999) the following is of relevance in terms of the general protection of heritage resources:

Historical remains

Section 34(1) No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

Archaeological remains

Section 35(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority or to the nearest local authority or museum, which must immediately notify such heritage resources authority.

Subsection 35(4) No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist with the detection or recovery of metals or archaeological material or objects, or use such equipment for the recovery of meteorites.

Subsection 35(5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedures in terms of section 38 has been followed, it may-

- (a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
- (b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
- (c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph (a) to apply for a permit as required in subsection (4); and
- (d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.

Subsection 35(6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated; serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

Burial grounds and graves

Subsection 36(3)

- (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-
- (c) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (d) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in detection or recovery of metals.

Subsection 36(6) Subject to the provision of any law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority-

- (a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
- (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the content of such grave or, in the absence of such person or community, make any such arrangement as it deems fit.

Culture Resource Management

Subsection 38(1) Subject to the provisions of subsection (7), (8) and (9), any person who intends to undertake a development* ...

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

***‘development’** means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including-

- (a) construction, alteration, demolition, removal or change of use of a place or a structure at a place;
- (b) carry out any works on or over or under a place*;
- (e) any change to the natural or existing condition or topography of land, and
- (f) any removal or destruction of trees, or removal of vegetation or topsoil;

***‘place’** means a site, area or region, a building or other structure* ...”

***‘structure’** means any building, works, device or other facility made by people and which is fixed to the ground ...”

2.2 The Human Tissues Act (65 of 1983)

This Act protects graves younger than 60 years. These fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

3. METHODOLOGY

3.1 Sources of information

The main sources of information are a pedestrian reconnaissance of the proposed project area, a literature review and the SAHRIS database. In addition, Google earth and the Topographical map 2329 CD was studied.

3.2 Limitations

No serious limitations were experienced with regard to the field survey, although dumped rubble does obscure surface visibility in places. The buildings on the property are used as residences and could not be access due to the tenants being absent.

It must be noted that most archaeological material is subterranean and may have been missed. Chance finds may occur.

3.3 Categories of significance

The significance of heritage sites is ranked into the following categories.

No significance: sites that do not require mitigation.
Low significance: sites, which <i>may</i> require mitigation.
Medium significance: sites, which require mitigation.
High significance: sites, which must not be disturbed at all.

The significance of specifically an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences.

3.4 Terminology

Early Stone Age:	Predominantly the Oldowan artefacts and Acheulian hand axe industry complex dating to + 1Myr yrs – 250 000 yrs. before present.
Middle Stone Age:	Various lithic industries in SA dating from ± 250 000 yrs. - 22 000 yrs. before present.
Late Stone Age:	The period from ± 22 000-yr. to contact period with either Iron Age farmers or European colonists.
Early Iron Age:	Most of the first millennium AD
Middle Iron Age:	10 th to 13 th centuries AD

Late Iron Age:	14 th century to colonial period. <i>The entire Iron Age represents the spread of Bantu speaking peoples.</i>
Phase 1 assessments:	Scoping surveys to establish the presence of and to evaluate heritage resources in a given area
Phase 2 assessments:	In depth culture resources management studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling could be undertaken.
Sensitive:	Often refers to graves and burial sites, as well as ideologically significant sites such as ritual / religious places. <i>Sensitive</i> may also refer to an entire landscape / area known for its significant heritage remains.
NHRA	National Heritage Resources Act (Act 25 of 1999)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

4. BASELINE INFORMATION

Except for the general historical research by Changuion (1986) and Loubser (1994) who researched the Ndebele archaeology of the area, no other significant research was conducted in the project area. The baseline information is mainly generic.

4.1 The Stone Age

The Stone Age covers most of southern Africa and the earliest consist of the Oldowan and Acheul artefacts assemblages. Oldowan tools are regularly referred to as “choppers”. Oldowan artefacts are associated with Homo *habilis*, the first true humans. In South Africa definite occurrences have been found at the sites of Sterkfontein and Swartkrans. Here they are dated to between 1.7 and 2 million years old. Bearing in mind the proximity of the Makapans Valley palaeontological site about 50km south-east of the project area it is possible that they may occur here. This was followed by the Acheulian technology from about 1.4 million years ago which introduced a new level of complexity. The large tools that dominate the Acheulian artefact assemblages range in length from 100 to 200 mm or more. Collectively they are called bifaces because they are normally shaped by flaking on both faces. In plan view, they tend to be pear-shape and are broad relative to their thickness. Most bifaces are pointed and are classified as handaxes, but others have a wide cutting end and are termed cleavers. The Acheulian design persisted for more than a million years and only disappeared about 250 000 years ago. Here, too the Makapans Valley Site is referenced; especially the Cave of Hearths.

The change from Acheulian with their characteristic bifaces, handaxes and cleavers to Middle Stone Age (MSA), which are characterized by flake industries, occurred about 250 000 years ago and ended about 30 000 – 22 000 years ago. For the most part the MSA is associated with modern humans; Homo sapiens. MSA remains are found in open spaces where they are regularly exposed by erosion as well as in caves. Characteristics of the MSA are flake blanks in the 40 – 100 mm size

range struck from prepared cores, the striking platforms of the flakes reveal one or more facets, indicating the preparation of the platform before flake removal (the prepared core technique), flakes show dorsal preparation – one or more ridges or arise down the length of the flake – as a result of previous removals from the core, flakes with convergent sides (laterals) and a pointed shape, and flakes with parallel laterals and a rectangular or quadrilateral shape: these can be termed pointed and flake blades respectively. Other flakes in MSA assemblages are irregular in form. The Cave of Hearths in the Makapans Valley Site is referenced.

The change from Middle Stone Age to Later Stone Age (LSA) took place in most parts of southern Africa little more than about 20 000 years ago. It is marked by a series of technological innovations or new tools that, initially at least, were used to do much the same jobs as had been done before, but in a different way. Their introduction was associated with changes in the nature of hunter-gatherer material culture. The innovations associated with the Later Stone Age “package” of tools include rock art – both paintings and engravings, smaller stone tools, so small that the formal tools less than 25mm long are called microliths (sometimes found in the final MSA) and Bows and arrows. Rock art is an important feature of the LSA and is abundant in the Waterberg and the Makgabeng. Rock art has been recorded on the nearby Bakone Malapa Museum and at Moletji, about 25km to the north-north-west.

4.2 The Iron Age (Early Farming Communities)

The Iron Age represents a period when “new” people moved into southern Africa from about 1800 years ago. As opposed to nomadic hunter-gatherer Stone Age people, Iron Age people lived in permanent settlements and were agro-pastoralists. They used iron for tool making and made pottery for cooking and storing food and liquids. They also represent the spread of the Eastern Bantu language into southern Africa.

The Iron Age can be divided into three periods:

The **EARLY IRON AGE** (AD 200 – 1000) consisting of:

- The Urewe Tradition, originating in the Great Lakes area of Central Africa, was a secondary dispersal centre for eastern Bantu speakers. It represents the eastern stream of migration into Southern Africa. The Uruwe Tradition consists of various Branches and ceramic units or facies.
- The Kalundu Tradition, originating in the far North of Angola, was another secondary dispersal centre for eastern Bantu speakers and represents the western stream of migration into Southern Africa. It is only Shona speakers and the mixed Shona-Venda speakers who descend from this Tradition :

The **MIDDLE IRON AGE** (AD 900 – 1300):

The Middle Iron Age represents Mapungubwe and the origins of Great Zimbabwe. They are descendants of the Early Iron Age Kalundu Tradition. The Shona of Zimbabwe and the royal families of the Venda descend from the Zimbabwe culture.

The **LATE IRON AGE** (AD 1300 – 1840) consisting of:

- The Blackburn Branch:

The Blackburn Branch is part of the Uruwe Tradition and originated in the Great Lakes area of central Africa. From here they migrated southward and reach northern Kwa-Zulu Natal anytime by about AD 1050 - 1500. The Blackburn Branch represents the Nguni Speakers of southern Africa.

- The Moloko Branch:

The Moloko Branch is also part of the Uruwe Tradition and originated in southern Tanzania from where they migrated southward to reach the Limpopo by AD 1300. The Moloko Branch represents the Sotho-Tswana speakers of southern Africa.

According to the most recent archaeological cultural distribution sequences by Huffman (2007), this area falls within the distribution area of various cultural groupings originating out of both the Uruwe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). These are represented by ceramic facies (pottery). The facies that may be present are:

Uruwe Tradition:	Kwale branch	Mzonjani facies AD 450 – 750 (Early Iron Age)
	Moloko branch	Icon facies AD 1300 - 1500 (Late Iron Age)
Kalundu Tradition:	Happy Rest sub-branch	Doornkop facies AD 750 - 1000 (Early Iron Age)
		Eiland facies AD 1000 – 1300 (Middle Iron Age)
		Klingbeil facies AD 1000 - 1200 (Middle Iron Age)
		Letaba facies AD 1600 - 1840 (Late Iron Age)

The Letaba facies is associated with the Ndebele people of the Polokwane area (Loubser 1994).

Stone walled sites are common in the Polokwane area. Three different types of sites associated with stone walling are found in the area, which Loubser (1994) numbered as Group I, II and III sites. Stonewalled sites were normally situated on or close to rocky outcrops, due to the need for stone (Huffman 2007). No stonewalling is associated with the Early Iron Age (EIA) and all the stonewalled sites on the Polokwane plateau date to the Late Iron Age (LIA), from the 17th century onwards.

Group I

These sites are situated on prominent hilltops and consist of an array of sporadic walls, forming terraces, surrounding an area of relatively large enclosures in the centre. Walls were constructed of equal-sized granite blocks, or overturned builders forming a single line. Walls were inventively incorporated into the natural topography and they often appear discontinuous from above. Some terraces were formed by middens heaped up against the rocks, while others were purposefully quarried (Loubser 1994:76). This type of site appears to have been inhabited by Melora Nguni, as similar walling on the saddle of Bambo Hill, at the Bakoni Malapa Museum, is regarded as characteristic of Melora walling (Huffman. pers. comm., 2007).

Group II

This group of sites is located at the base of hills or on gradual rises between valleys, generally facing north. Each site consists of orderly concentric units, with a perimeter wall around a corridor leading to a central enclosure, with smaller ones around it. Walls are mostly of quartzite with granite and milky quartz was also used. Walls comprise two outer faces with stone and rubble infill. Large ashy deposits and dense patches of vegetation are diagnostic of this type of site (Loubser 1994).

Similar sites are associated with Kone along the Eastern Plateau. These sites were most likely situated there due to the fact that the area falls in the mist belt and would offer some additional moisture. These sites are named Badfontein sites by Huffman (2007) in reference to work

conducted by Collett and there are a number of these sites depicted in rock engravings in the Lydenburg area.

The earliest of the Group II sites, situated along the base of hills, were built in the seventeenth century and were inhabited by Ndebele and Kone people. The first such sites that were built on rises between the valleys date to AD 1838, when chief Mungali and others started to settle in these areas. Most of the Group II sites in the area lasted till 1855 when they were abandoned after the Voortrekkers moved into the area (Loubser 1994). These sites, which occur on the gradual rises, are bigger and contain more units than the sites along the hills. It would seem that the population of the area increased, as reflected in the size of the larger settlements. There is also evidence that the sites along the hills were still occupied after the construction of the other sites by incoming groups. This area, as elsewhere in Iron Age Africa, settlement size is linked to the power of the chief, the larger the settlement and the more units, the more powerful the chief or headman (Loubser 1994).

Group III

These sites are an imploded and random version of Group II sites, with the perimeter wall being scalloped and linked to a series of central enclosures by straight walls. These sites are found at the base of hills and on rises such as Group II sites. Some, however, have also been located on the top of hills. Walls are similarly constructed to Group II walls, with sparse cultural deposits such as middens (Loubser 1994). These Group III sites appear to have been built after 1855 when the Voortrekkers took control of the area. Areas where Group II sites were located were seldom reoccupied, most likely out of reverence for the ancestral spirits. These Group III sites were occupied by minor headman with little real power and the site layout reflects the socio-economic situation of these groups during this time (Loubser 1994).

4.3 The historical landscape

Polokwane (Pietersburg) was ultimately established in 1886, although people of European descent occupied the area since 1848 and especially after 1867 with the collapse of Schoemansdal, which was located at the base of the Soutpansberg. By then most of the organised Ndebele chieftainships had relocated away from the Polokwane area to the Mokopane area. From 1867 the general area was subdivided into farms and as the town developed, so did the need for industrialisation and the development of the local mining infrastructure (Changuion 1986).

5. RESULTS OF THE SURVEY

5.1 Palaeontology

The project area is coloured grey on the SAHRA PalaeoSensitivity map with insignificant sensitivity. No palaeontological study is required (also see Almond 2013). The area is underlain by ancient Precambrian (Archaean) granite-gneisses of the Hout River Gneiss Suite (Rhr) that has been dated to approximately 3.3 Ga (1:50 000 Geological series. Figure 5)

5.2 Stone Age remains

No Stone Age material was observed in the project area.

5.3 Late Iron Age (Early Farming Communities)

As mentioned under Heading 4, BASELINE INFORMATION, Loubser (1994) recorded a large number of stonewalled settlements in the Polokwane area. A group II stonewalled settlement was located at coordinates 23°55'25.0"S 29°26'13.0"E, approximately 800m north-east of the project area, but has largely been destroyed by recent developments and only remnants of it exists.

No Iron Age material or remains were observed in the project area.

5.4 Graves and burials sites

No graves or burial sites were observed in the project area.

5.5 The built environment

Buildings exist on Smallholdings 78, 79, 80 and 81. No buildings are visible on Smallholding 82. The buildings were numbered as cluster 1 (Smallholding 81), cluster 2 (Smallholding 80), cluster 3 (Smallholding 79) and cluster 4 (Smallholding 78) (Figure 4).

Cluster 1:

It consists of two main buildings, namely a house or dwelling (Figure 6) and outbuilding (Figure 7).

The dwelling has been altered and added on quite extensively, but the original structure with a flat roof and veranda supported by pillars is likely older than 60 years. It is provisionally protected by section 34 of the NHRA.

The outbuilding which appears to originally have been a shed/garage and built of cement blocks has been altered into living quarters and added on.

Cluster 2:

It consists of 4 separate buildings and a ruin. One, which seems to be the original house, has been added on (Figure 8), but the original structure is older than 60 years and provisionally protected by section 34 of the NHRA.

The other three buildings are residences and are relatively modern and not culturally significant (Figures 9 & 10).

Cluster 3:

It consists of a modern dwelling built of face bricks, a shed and a corrugated iron shack. None of the buildings are culturally significant (Figure 11).

Cluster 4:

It consists of a partially demolished dwelling and some detached shacks that are currently occupied (Figure 12). This portion also has a large concrete reservoir with a collapsed side (Figure 13).

None of the buildings are culturally significant.

6. DISCUSSION

No archaeological sites or material or graves and burial sites were observed in the project area.

There are structures older than 60 years on Smallholdings 80 and 81. Although not regarded as culturally significant due to alterations and neglect, these are provisionally protected by Section 34 of the National Heritage Resources Act and may not be demolished without a permit from the Limpopo Heritage Resources Authority (LIHRA).

Specific Phase 2 heritage assessments must be conducted for the structures older than 60 years.

From a heritage management perspective there are no fatal flaws or key uncertainties and risks associated with the proposed development.

7. EVALUATION AND STATEMENT OF SIGNIFICANCE

7.1 Significance criteria in terms of Section 3(3) of the National Heritage Resources Act.

Table 1: Significance criteria and rating

	Significance	Rating
1.	The importance of the cultural heritage in the community or pattern of South Africa's history (Historic and political significance)	Low
2.	Possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage (Scientific significance).	Low
3.	Potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage (Research/scientific significance)	Low
4.	Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects (Scientific significance)	None
5.	Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group (Aesthetic significance)	Low
6.	Importance in demonstrating a high degree of creative or technical achievement at a particular period (Scientific significance)	None
7.	Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (Social significance)	Low
8.	Strong or special association with the life and work of a person, group or organization of importance in the history of South Africa (Historic significance)	None
9.	The significance of the site relating to the history of slavery in South Africa.	None

7.2 **Section 38(3) (c) An assessment of the impact of the development on such heritage resources.**

The development will have an impact on structures older than 60 years.

7.3 Section 38(3) (d) An evaluation of the impact of the development on heritage resources relative to the sustainable economic benefits to be derived from the development.

The structures older than 60 years have undergone alterations and are neglected resulting in the fact that the sustainable economic benefits to be derived from the development outweigh their significance.

7.4 Section 38(3) (e) The results of consultation with the communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources.

The development will have no direct impact on local communities.

7.5 Section 38(3)(f) If heritage resources will be adversely affected by the proposed development the consideration of alternatives.

No alternatives exist and the adverse effects must be mitigated.

7.6 Section 38(3)(g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

Refer to recommendations below.

8. RECOMMENDATIONS

In view of the above it is recommended that;

- Phase 2 assessments be conducted for the two structures on smallholdings 80 & 81 that were identified as being 60 years or older;
- Based on the outcome of the Phase 2 assessments, permit applications be submitted to LIHRA for their demolition.

From a heritage resources management perspective, there is no reason why the development may not proceed.

9. REFERENCES

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10. MAPS AND IMAGES (Figures 1 – 18)



Figure 1. Google earth image of the project location with Smallholding numbers.



Figure 2. Google earth image of the project location in relation to Polokwane (South).



Figure 3. Google earth image of the project area with GPS tracking.



Figure 4. Google earth image (historical 2009) indicating the building clusters.

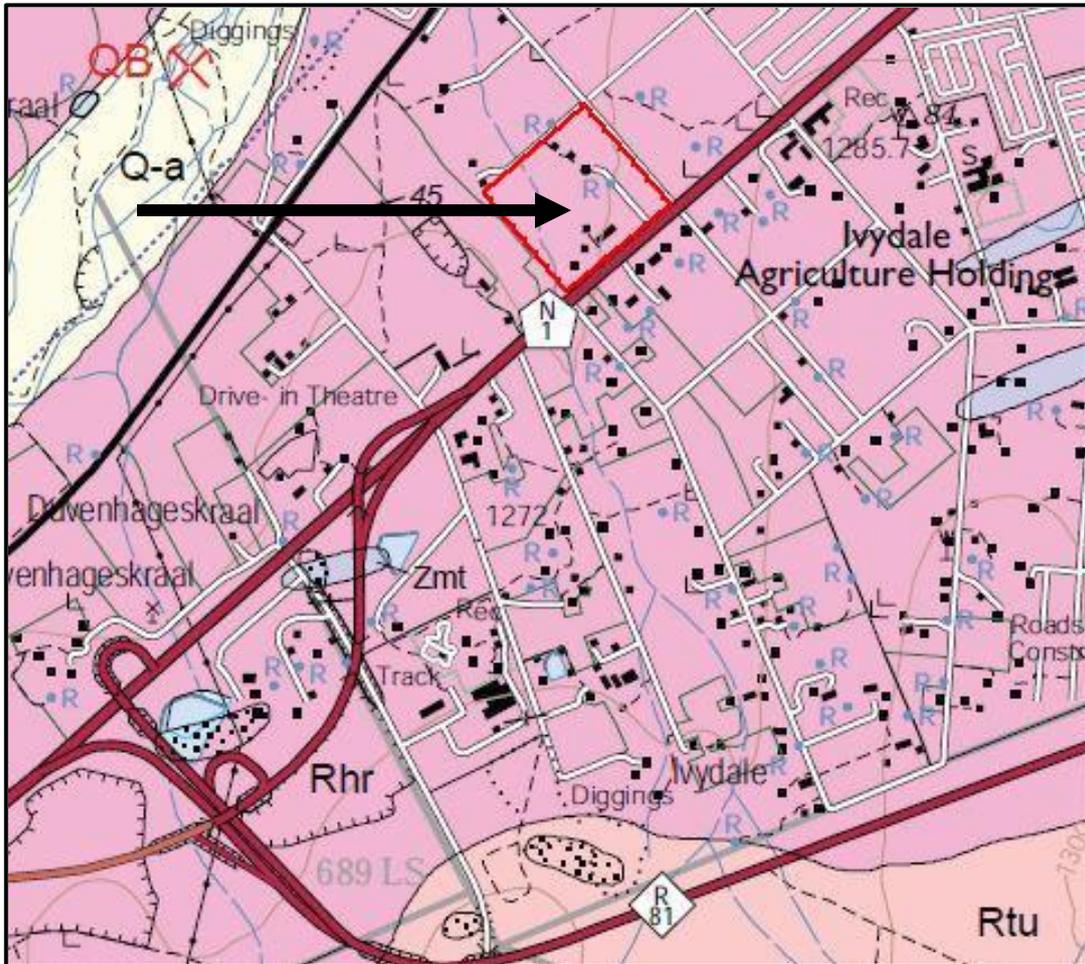


Figure 5. 1:50 000 Geological series, 2004. 2329CD Polokwane. Council for Geoscience. The arrow point to the project area.



Figure 6. Dwelling structure likely to be older than 60 years – cluster 1.



Figure 7. Outbuilding at cluster 1.



Figure 8. Dwelling structure older than 60 years at cluster 2.



Figure 9. Modern structure at cluster 2.



Figure 10. Modern structure at cluster 2.



Figure 11. Modern structure at cluster 3.



Figure 12. View of partially demolished structure at cluster 4.



Figure 13. View of a weir in the drainage line.



Figure 14. View of old reservoir on Smallholding 78.



Figure 15. View of dumping on Smallholding 81.



Figure 16. View of dumping on Smallholding 80.



Figure 17. View of dumped garden waste on western part of Smallholding 78.

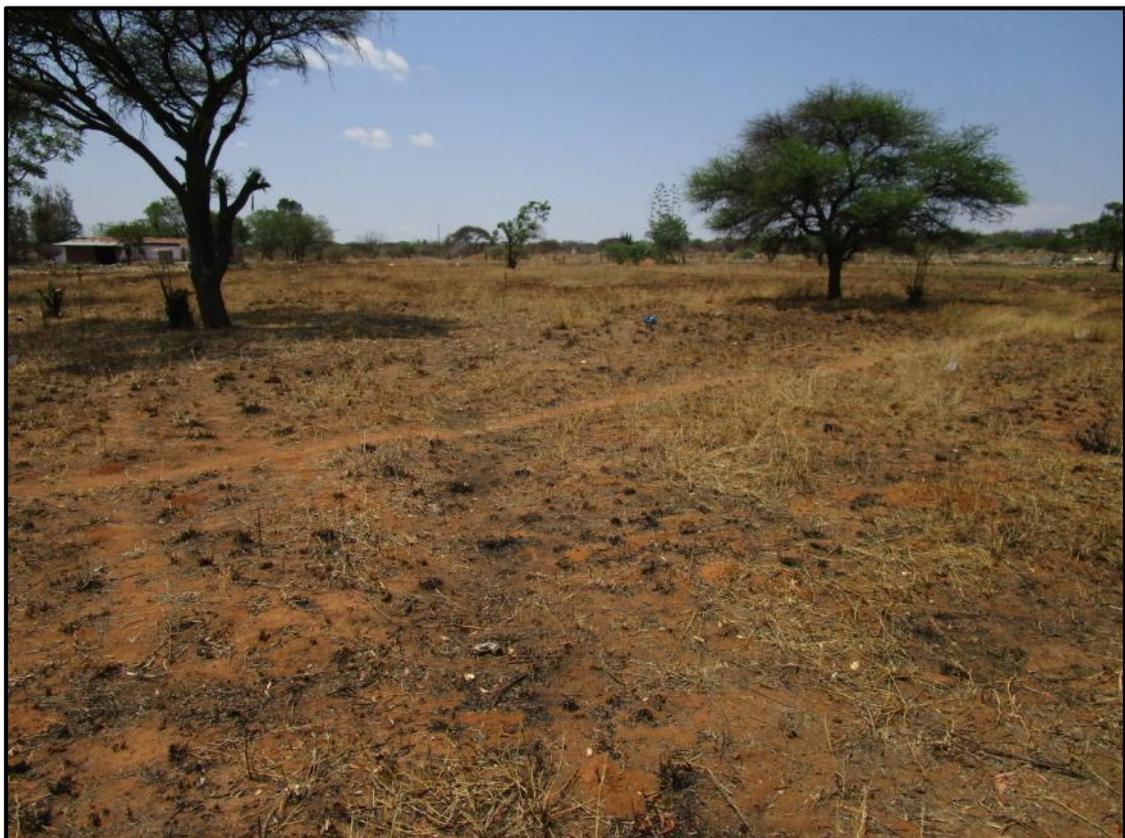


Figure 18. View of old cultivated field on Smallholding 80.