

**Heritage Impact Assessment for the
PROPOSED WATERBERG PHOTOVOLTAIC PLANT,
WATERBERG MAGISTERIAL DISTRICT, LIMPOPO PROVINCE**



HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED WATERBERG PHOTOVOLTAIC PLANT, WATERBERG MAGISTERIAL DISTRICT, LIMPOPO PROVINCE

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Prepared for:

Savannah Environmental (Pty) Ltd
Representative: Ms Jo-Anne Thomas

Postal Address: PO Box 148, Sunninghill, 2151
Tel: 011 234 6621
E-mail: joanne@savannahsa.com

Prepared by:

J van Schalkwyk (D Litt et Phil), Heritage Consultant
ASAPA Registration No.: 168
Principal Investigator: Iron Age, Colonial Period, Industrial Heritage

Postal Address: 62 Coetzer Avenue, Monument Park, 0181
Mobile: 076 790 6777
Fax: 012 347 7270
E-mail: jvschalkwyk@mweb.co.za

Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



J A van Schalkwyk (D Litt et Phil)
Heritage Consultant
September 2010

EXECUTIVE SUMMARY

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED THUPELA WATERBERG PHOTOVOLTAIC PLANT, WATERBERG MAGISTERIAL DISTRICT, LIMPOPO PROVINCE

Thupela Energy is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on a site located north east of the town of Vaalwater in Limpopo Province.


The facility is proposed to be established on degraded pasture land on a portion of Portion 2 of the Farm Goedgevonden KR 104, located approximately 24 km east of Vaalwater within the Modimolle Local Municipality, Limpopo Province. The site falls outside of the boundary of the Waterberg Biosphere Reserve. The larger site covers an area of approximately 50 ha, with the development footprint for the proposed facility being approximately 20 ha.

The aim of the survey was to locate, identify, evaluate, and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop the solar power plant.

As very few systematic surveys have been done, little is known about the heritage resources in the region. Available information indicates that few sites would occur in or close to the study area.

- As no heritage sites exist in the study area, there would be no impact resulting from the proposed development.

Therefore, from a heritage point of view it is recommended that the proposed development be allowed to continue. However, it is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.



J A van Schalkwyk
Heritage Consultant
September 2010

TECHNICAL SUMMARY

Property details						
Province	Limpopo					
Magisterial district	Waterberg					
Topo-cadastral map	2428AB					
Closest town	Vaalwater					
Farm name/s	Goedgevonden 104KR					
Portions/Holdings	Portion 2					
Coordinates	Centre point					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 24.19641	E 28.32098			

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	Yes
Any other development category, public open space, squares, parks, recreation grounds	No

Development	
Description	Development of a solar power plant
Project name	Waterberg Photovoltaic Plant

Land use		
Previous land use	land	Farming: crop production
Current land use	land	Farming: crop production

Heritage sites assessment		
Site type	Site significance	Site grading (Section 7 of NHRA)
None	None	None

Impact assessment		
Impact	Mitigation	Permits required
None	None	None

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 - 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. These people, according to archaeological evidence, spoke early variations of the Bantu Language. Because they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED WATERBERG PHOTOVOLTAIC PLANT, WATERBERG MAGISTERIAL DISTRICT, LIMPOPO PROVINCE

1. INTRODUCTION

Thupela Energy is proposing the establishment of a commercial solar electricity generating facility and associated infrastructure on a site located north east of the town of Vaalwater in Limpopo Province.

The facility is proposed to be established on degraded pasture land on a portion of Portion 2 of the Farm Goedgevonden KR 104, located approximately 24 km east of Vaalwater within the Modimolle Local Municipality, Limpopo Province. The site falls outside of the boundary of the Waterberg Biosphere Reserve. The larger site covers an area of approximately 50 ha, with the development footprint for the proposed facility being approximately 20 ha but not more than 30 ha.

The facility is proposed to have a generating capacity of up to 5 MW which will be achieved through the use of an array of photovoltaic (PV) panels. The facility is also proposed to have the following associated infrastructure:

- A **switching station** for the “turn in” into Eskom’s existing Mink Power Line (it has been determined this line has spare capacity to receive the power from the proposed solar facility)
- An **extraction point** and low volume **water supply pipeline** for the extraction of water from existing on-site boreholes. This will only be for the purpose of ablution facilities on site as the photovoltaic panels will be cleaned using pressurised air
- **Access roads** within the site (for the purposes of construction and limited maintenance)
- **Workshop, laydown** and **storage areas**
- A **Visitors Centre** utilising Eco-Loos for the purpose of sanitation

South Africa’s heritage resources, also described as the ‘national estate’, comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Savannah Environmental** to conduct a Heritage Impact Assessment to determine if any sites, features, or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the solar power plant.

2. TERMS OF REFERENCE

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which all available literature, reports, databases and maps were studied
- A visit to the proposed development area

The objectives were to

- 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

Type of study	Aim	SAHRA involved	SAHRA response
Heritage Impact Assessment	<p>The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.</p> <p>The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.</p> <p>Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.</p>	Provincial Heritage Resources Authority	Comments on built environment and decision to approve or not
		SAHRA Archaeology, Palaeontology and Meteorites Unit	Comments and decision to approve or not

3. HERITAGE RESOURCES

3.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- Places, buildings, structures and equipment of cultural significance;
- Places to which oral traditions are attached or which are associated with living heritage;
- Historical settlements and townscapes;
- Landscapes and natural features of cultural significance;
- Geological sites of scientific or cultural importance;
- Archaeological and palaeontological sites;
- Graves and burial grounds, including-
 - Ancestral graves;
 - Royal graves and graves of traditional leaders;
 - Graves of victims of conflict;
 - Graves of individuals designated by the Minister by notice in the Gazette;
 - Historical graves and cemeteries; and
 - Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- Sites of significance relating to the history of slavery in South Africa;
- Movable objects, including-
 - Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - Objects to which oral traditions are attached or which are associated with living heritage;
 - Ethnographic art and objects;
 - Military objects;
 - Objects of decorative or fine art;
 - Objects of scientific or technological interest; and
 - Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature's uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of:

- Its importance in the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- 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
- Sites of significance relating to the history of slavery in South Africa.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey covers the area as presented in Section 5 and as illustrated in Figures 1 - 2.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted.

- One study done in the region to the south of the study area was identified (De Jong 2005).

4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *Chief Surveyor General*, and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.
- The original Title Deed for the farm was located in the records of the Chief Surveyor-General and indicated that the farm was originally surveyed in 1896. No references to the property were traced in the National Archives of South Africa.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

Information of a very general nature were obtained from these sources

4.2.2 Field survey

The area that had to be investigated was identified by **Savannah Environmental** by means of maps.

4.3 Limitations

None at present

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location and description

The study area is located to the north east of the town of Vaalwater in the Waterberg magisterial district of Limpopo Province. For more detail, please see the Technical Summary presented above.

The geology of the region is made up of arenite. The original vegetation consists of Mixed Bushveld, some of which has been replaced due to the making of agricultural fields. The topography of the area is classified as lowlands with hills, with the Melkriver passing through the area and forming the eastern boundary of the study area.

The area under consideration has been used as agricultural fields, irrigated by means of a centre pivot system. Having been ploughed over in the past, it is highly likely that any heritage sites, features or objects that might have occurred here in the past, were destroyed.

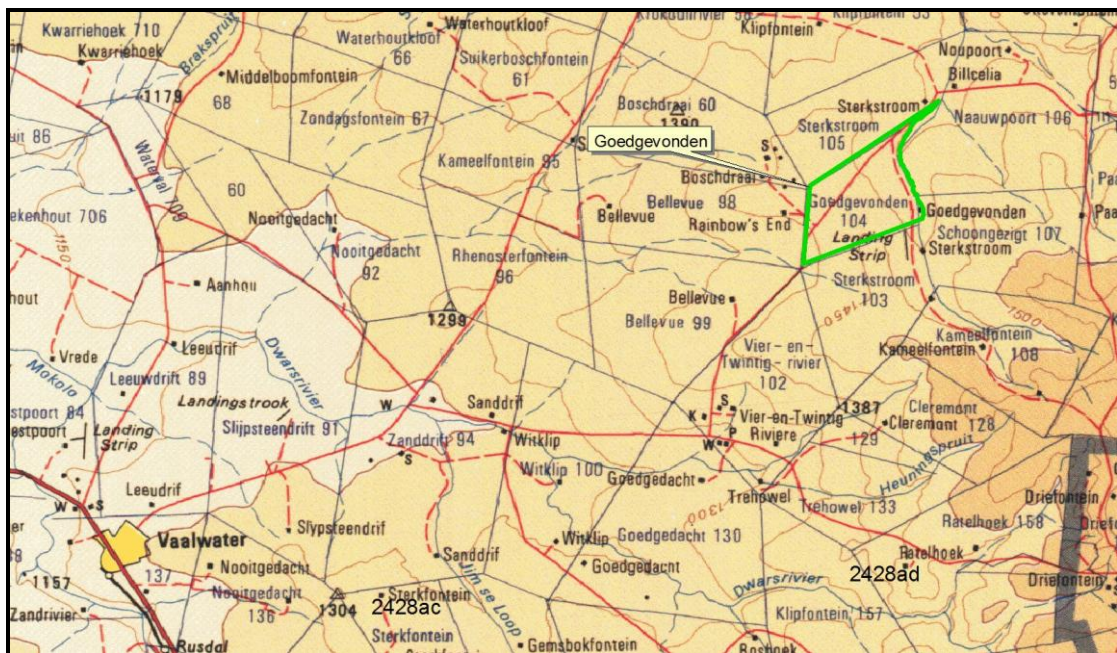


Figure 1: Location of the study area (green outline) in regional context (Map 2428: Chief Surveyor-General)

5.2 Regional overview

Nothing much is known as no systematic surveys have been done in the region. However, some sites dating to the Stone Age are known to occur to the north and west of the study region. Some of these also contain rock art. These sites are usually found in river valleys where small rock shelters were carved out by streams.

In addition, it can be expected that some Iron Age sites can be identified in the more flat open regions near the river. However, as yet there are no reports on the existence of such sites.

Lastly, sites dating to historic times are known to exist all over. Typical of these would be farmsteads with old buildings and associated farming related features, as well as informal cemeteries. An exception is the St. Johns Anglican Church at Vier-en-Twintig- Rivier south of the study area (see front page). This church was designed by Sir Herbert Baker and consecrated in 1914.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Heritage assessment criteria and grading

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region
- **Grade III:** Other heritage resources worthy of conservation on a local authority level

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable of mitigation measures would allow the development activities to continue.

6.2 Statement of significance

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites. Three categories of significance are recognised: low, medium and high. In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a grading as identified in the table below.

Table 1: Summary of identified heritage resources in the study area.

Identified heritage resources	
<i>Category, according to NHRA</i>	<i>Identification/Description</i>
Formal protections (NHRA)	
National heritage site (Section 27)	None
Provincial heritage site (Section 27)	None
Provisional protection (Section 29)	None
Place listed in heritage register (Section 30)	None
General protections (NHRA)	
Structures older than 60 years (Section 34)	None
Archaeological site or material (Section 35)	None
Palaeontological site or material (Section 35)	None
Graves or burial grounds (Section 36)	None
Public monuments or memorials (Section 37)	None
Other	
Any other heritage resources (describe)	None

6.3 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the current understanding of the development.

Table 2: Summary of identified sites

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
None	None	None
Impact assessment		
<i>Impact</i>	<i>Mitigation</i>	<i>Permits required</i>
None	None	None

As there are no sites, features, or objects of cultural significance in the study area, there would be no impact from the proposed development.

7. CONCLUSIONS

The aim of the survey was to locate, identify, evaluate, and document sites, objects and structures of cultural significance found within the area in which it is proposed to develop a PV plant.

As very few systematic surveys have been done, little is known about the heritage resources in the region. Available information indicates that few sites would occur in or close to the study area.

As no heritage sites in the study area, there would be no impact resulting from the proposed development.

Therefore, from a heritage point of view it is recommended that the proposed development be allowed to continue. However, it is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

8. REFERENCES

8.1 Data bases

Chief Surveyor General

Environmental Potential Atlas, Department of Environmental Affairs and Tourism.

Heritage Atlas Database, Pretoria.

National Archives of South Africa

8.2 Literature

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

Coetzee, C.B. (ed.) 1976. *Mineral resources of the Republic of South Africa*. Handbook No. 7, Geological Survey. Pretoria: Government Printer.

De Jong, R.C. 2005. *Level 2 (Heritage scooping) report: proposed development of full title deed units on Portions of the farms Buffelsfontein 55KR, Buffelshoek 54Kr, Matjesgoedfontein 57KR and Zondagsloop 56KR (collectively known as Nyathi Game Reserve, north of Vaalwater, Limpopo Province*. Unpublished report. Pretoria: Cultmatrix.

Holm, S.E. 1966. *Bibliography of South African Pre- and Protohistoric archaeology*. Pretoria: J.L. van Schaik.

8.4 Maps and aerial photographs

1: 50 000 Topocadastral maps: 2428AB

Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance			
	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			
1.	Low		
2.	Medium		

3.	High	
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Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a "no-go" implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs
- 5 = retain graves

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(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 offices or museum, which must immediately notify such heritage resources authority.

(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 in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

- (b) 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
 (c) 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 the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

APPENDIX 3: SURVEY RESULTS

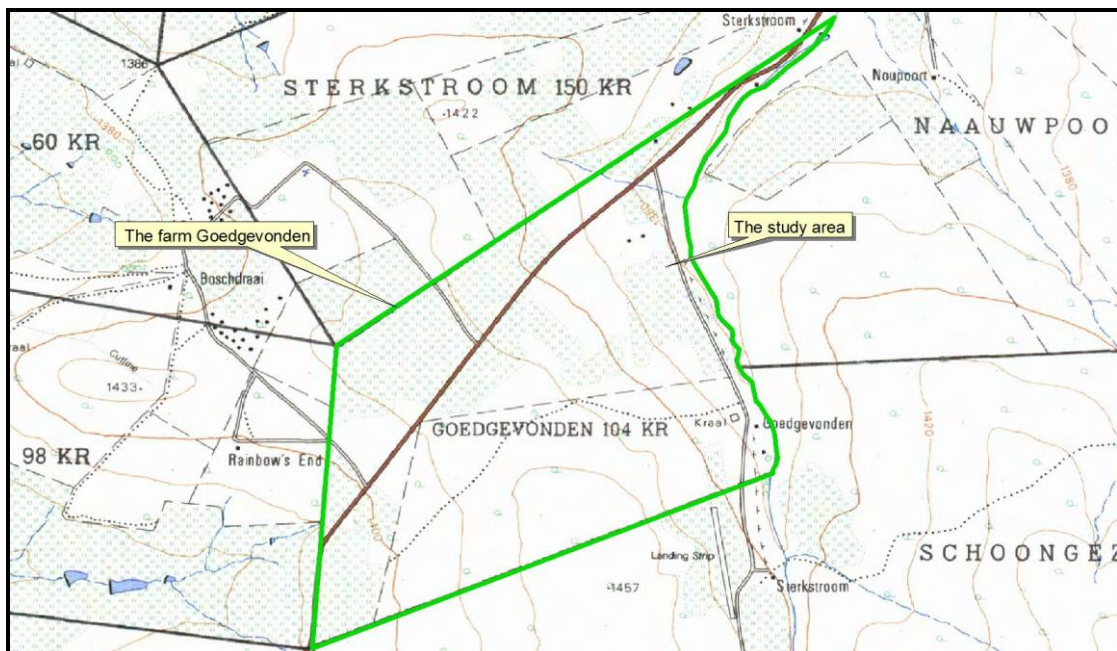


Fig. 2. The study outlined in green.
 (Map 2428AB: Chief Surveyor-General)

Sites identified in the study area: Nil

APPENDIX 4: ILLUSTRATIONS

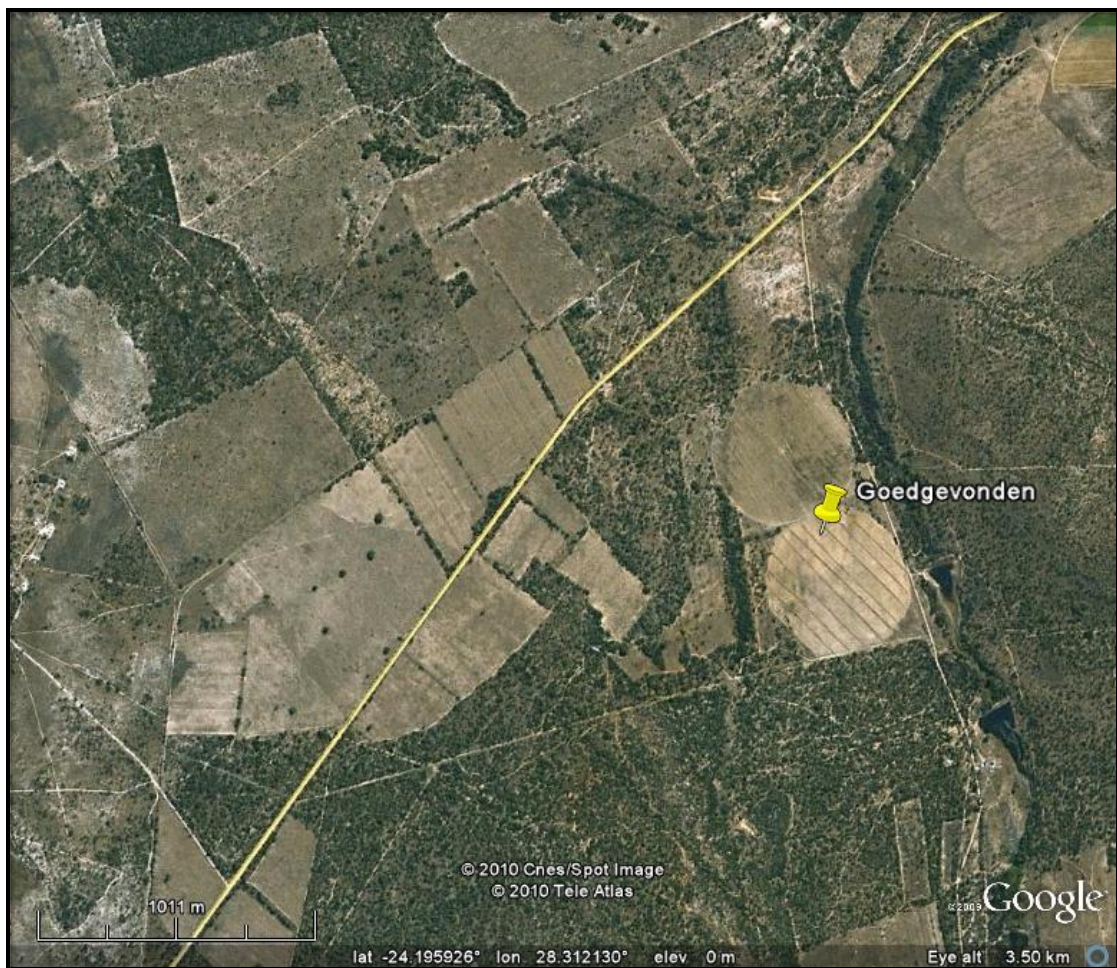


Fig. 3. The study area seen from the air.
(Photo: Google Earth)

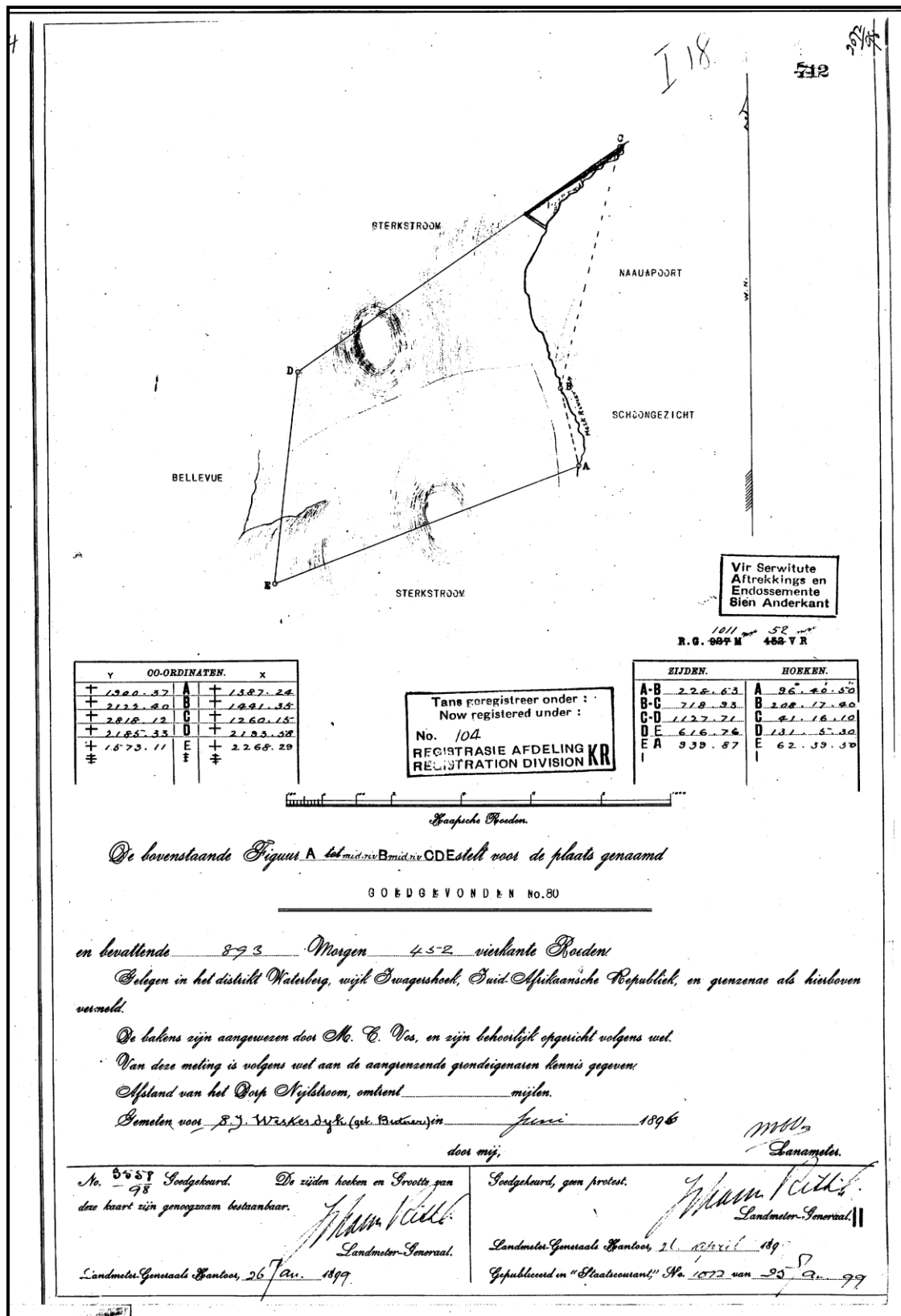


Fig. 4. Original Title Deed for the farm, dating to 1896.



Fig. 5. The study area looking west.



Fig. 6. The study area looking east.



Fig. 7. The study area looking south.