

# Archaeological Impact Assessment

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For The Proposed Transalloys Coal-Fired Power Plant, Clewer, Mpumalanga Province.

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Prepared For  
**Savannah Environmental (Pty) Ltd**

**By**



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## EXECUTIVE SUMMARY

**Site name and location** Transalloys is located approximately 8km west of Emalahleni, south of the N4 highway and north of Clewer, Mpumalanga Province.

**Purpose of the study:** Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed development of a coal-fired power station and associated infrastructure on these resources within the study area.

**1:50 000 Topographic Map:** 2529 CC

**Environmental Consultant:** Savannah Environmental (Pty) Ltd.

**Developer:** GDF SUEZ Energy Southern Africa (Pty) Ltd

**Heritage Consultant:** Heritage Contracts and Archaeological Consulting CC (HCAC).

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**Date of Report:** 28 February 2014, Revised 4 August 2014.

### Findings of the Assessment:

During the initial scoping assessment (van der Walt 2013) for the project 5 site alternatives were proposed. Prior to the AIA site alternative 5 was not considered technically feasible by the client and is not considered as an option. The power station is proposed to be located in site alternative 1 and the ash disposal facility in site alternative 2, to the immediate east of the Transalloys smelter complex and slag dumps. During the survey the demolished remains of several structures were identified scattered over the study area. Due to the extent of the destruction to these structures they are of no heritage significance and not conservation worthy. Two initiation sites were also recorded on the banks of the "Brugspruit" as well as a large informal cemetery adjacent to the Transalloys access road. None of these three sites are located within the proposed site alternatives and no direct impact is foreseen on these sites.

From a heritage perspective the ash disposal facility within site alternative two is favourable as no sites or demolished structures occur in the proposed footprint. The power plant that is located in site alternative one is in near proximity to two demolished structures (WPT 321 & 322). There is nothing left of these structures and they do not have conservation value.

Subject to approval from SAHRA there is from an archaeological point of view no reason why the development should not proceed if the recommendations as made in this report are adhered to.

### General

Due to extensive ground disturbance and vegetation cover, archaeological visibility was low on portions of the site during the survey. It must also be noted that due to the subsurface nature of archaeological material and graves the possible occurrence of unmarked or informal graves and subsurface finds can thus not be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

**Disclaimer:** *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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- The technology described in any report;
- Recommendations delivered to the Client.

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## ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

*\*Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

## GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 200 000 years ago)

Middle Stone Age (~ 300 000 to 20 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

## 1 BACKGROUND INFORMATION

<b><i>Kind of study</i></b>	Archaeological Impact Assessment
<b><i>Type of development</i></b>	Power Station
<b><i>Developer:</i></b>	Transalloys
<b><i>Consultant:</i></b>	Savannah (Pty) Ltd

Heritage Contracts and Archaeological Consulting CC was contracted by Savannah Environmental (Pty) Ltd to conduct an Archaeological Impact Assessment for the Proposed Transalloys Coal-Fired Power Station, approximately 8km west of Emalahleni, south of the N4 highway and north of Clewer, Mpumalanga Province. The Archaeological Impact Assessment report forms part of the EIA for the proposed project.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a review of the heritage scoping report that includes collection from various sources and consultations; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey the remains of several demolished structures were recorded, one standing building, a cemetery and two initiation sites. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for peer review and comment.



## 1.1 Terms of Reference

### Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

### Reporting

Report on the identification of anticipated and cumulative impacts the operational units and associated infrastructure of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

## 1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2)(b) of the NEMA and sections 39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

### **1.3 Description of Study Area**

#### **1.3.1 Location Data**

The proposed power station is located adjacent to the existing Transalloys Smelter Complex which is located within 1km south-east of Evraz Highveld Steel. Five potential site alternatives (refer to Figure 1), located within or directly adjacent to the Transalloys complex have been identified for the potential siting of the power plant and include the following farm portions: Portions 25, 26, 33, 34, 35, 36 and 37 of the Farm Elandsfontein 309 JS, Portions 20, 24 and 38 of the Farm Schoongezicht 308 JS. Site alternative 5 was discarded as an option prior to the AIA and this area was not assessed during the survey.

The topography of the area is relatively flat and extensively altered by large scale industrial, mining development and agricultural activities that would have impacted on surface indicators of heritage sites. The "Brugspruit" traverses the study area in a north south direction.

The study area falls within the Mesic Highveld Grassland Bioregion as described by Mucina et al (2006) with the vegetation described as Rand Highveld Grassland. Land use in the general area is characterized by extensive mining. The study area is characterised by sandy to loamy soils.

1.3.2. Location Map

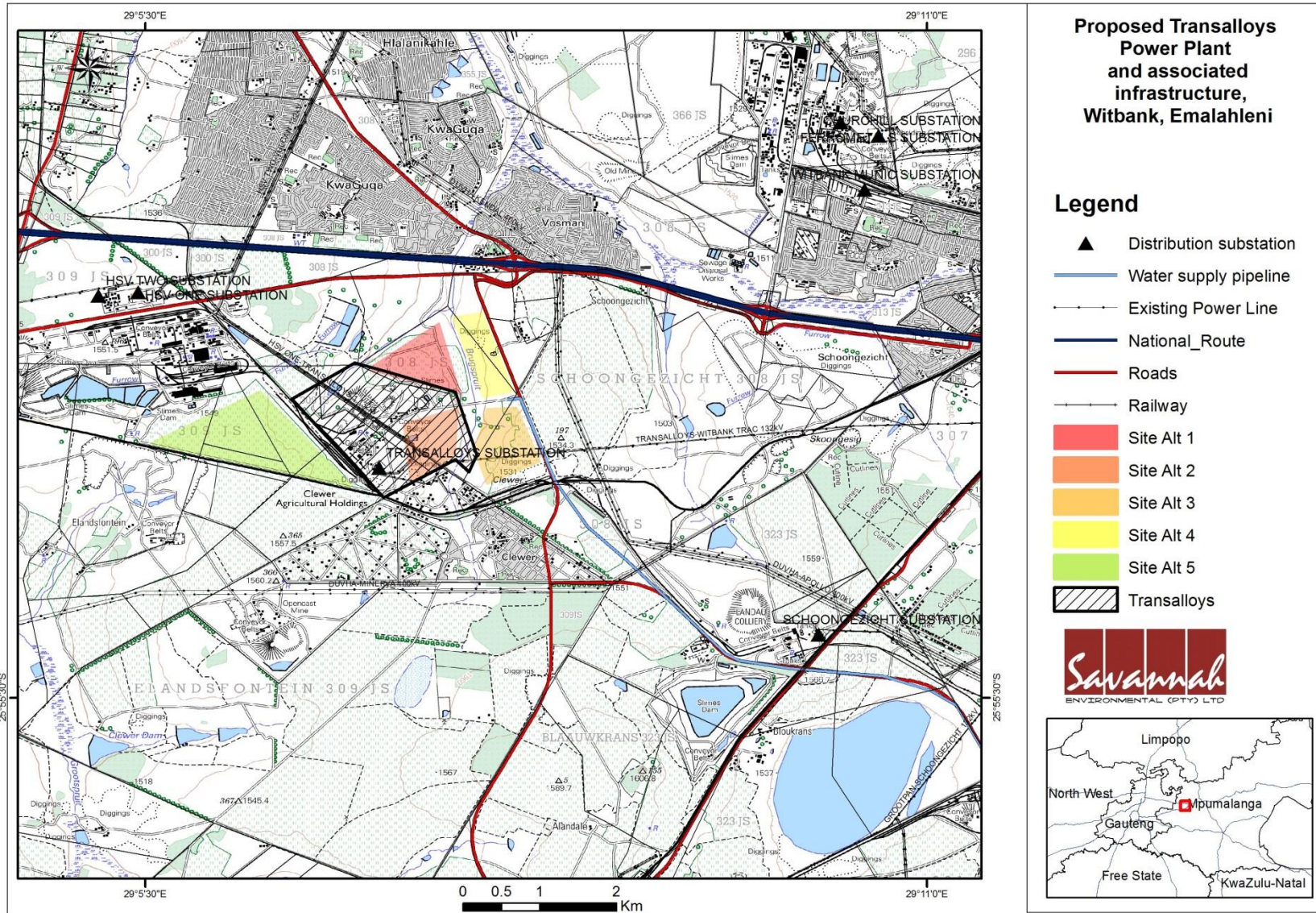


Figure 1: Power Station Location map.

### 1.3.3. Google Maps

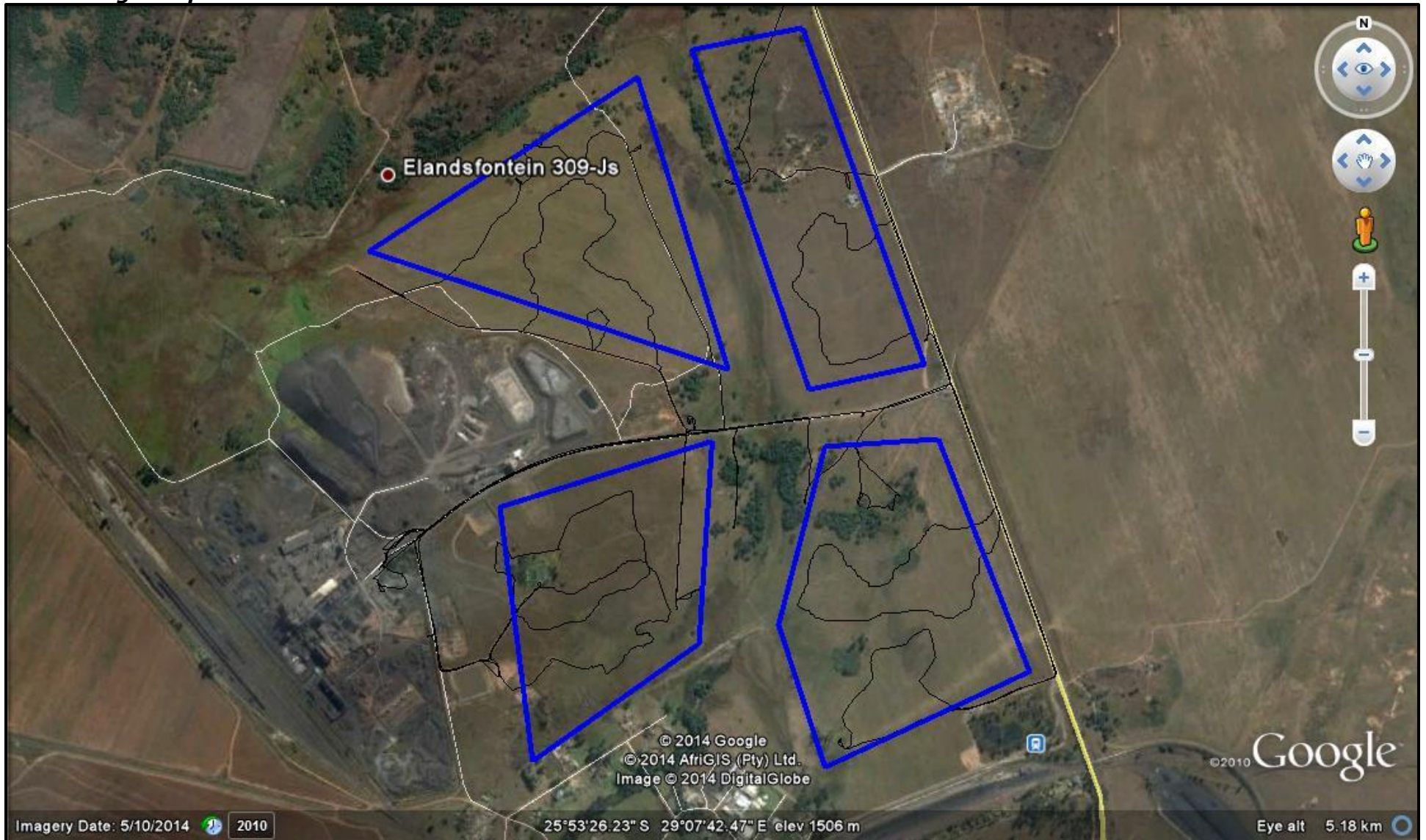


Figure 2: Google Image showing the four alternatives (blue) and track log (black) of the areas that were covered during the survey.

## **2. APPROACH AND METHODOLOGY**

The aim of the study is to cover archaeological databases and historical sources to compile a background history of the study area followed by field verification; this was accomplished by means of the following phases.

### **2.1 Phase 1 - Desktop Study**

The first phase comprised a desktop study, gathering data to compile a background history of the area in question. It included scanning existing records for archaeological sites, historical sites, graves, and ethnographical information on the inhabitants of the area. This phase consisted of a heritage scoping report completed by Heritage Contracts and Archaeological Consulting CC (van der Walt 2013).

#### **2.1.1 Literature Search**

In addition to the archival study from the scoping study the actions indicated below were also taken.

#### **2.1.2 Information Collection**

The SAHRIS and Wits archaeological database was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area. Large parts of the study area was covered previously by van Vollenhoven (2013 & 2014) while several other projects was conducted in the vicinity by van der Walt (2013), Murimbika 2008 and Huffman 1999. Two previously recorded sites are on record with the Archaeological databases at Wits University (referenced 2009) for the 2529 CC Topographical map. None of these sites are in close proximity to the study area and consists of Stone Age flakes dating to the MSA on the farm Blesboklaagte and Naaupoort

#### **2.1.3 Consultation**

A Public Participation process was conducted by Savannah Environmental for this project. No heritage concerns were raised.

#### **2.1.4 Google Earth and Mapping Survey**

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located. No sites are on record close to the study area.

#### **2.1.5 Genealogical Society of South Africa**

The database of the Genealogical Society was consulted to collect data on any known graves in the area. The only site located close to the study area is to the west at the Balmoral concentration camp cemetery.

### **2.2 Phase 2 - Physical Surveying**

A field survey of the power station alternatives of 165 ha was conducted; focusing on drainage lines, outcrops, high lying areas and disturbances in the topography. The study area was surveyed by means of vehicle and extensive surveys on foot by a professional archaeologist on the 11<sup>th</sup> July 2014. All sites discovered inside the proposed development area was plotted on 1:50 000 maps and their GPS co-ordinates noted. Digital photographs were taken at all the sites.

### **2.3. Restrictions**

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Low ground visibility of parts of the study area is due to high vegetation cover, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Only the footprint areas were surveyed as indicated in the location map, and not the entire farm. Although Heritage Contracts and Archaeological Consulting CC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

### **3 NATURE OF THE DEVELOPMENT**

Only one site will ultimately be identified for the construction of the power plant. The following infrastructure is associated with the proposed project:

#### **Power station (footprint of approximately 30ha)**

- » Main Plant House for one 150MW unit
- » Auxiliary plant buildings, including administration building and warehouse
- » Other operational support buildings
- » Maintenance workshops and storage facilities including electrical and instrument workshops and stores, and machine shop
- » Laboratory area for both routine testing and specialised analysis and investigation
- » Access roads
- » High voltage yard

#### **Associated infrastructure (footprint of approximately 30ha)**

- » In-plant coal stock yard and storage
- » Lime storage area
- » 250 meter high stack
- » Overland coal conveyors – from coal discard dumps in the area
- » Water supply pipeline
- » Amenities including potable water, sanitary and sewer utilities
- » Electrical utility interconnection and telephone utilities
- » Sewage treatment plant
- » Access road and internal roads
- » Ash dump
- » Ash dump runoff ponds
- » Water storage reservoir for raw water supply
- » Raw water treatment plant
- » Zero effluent/evaporation ponds
- » Recycling pond

#### 4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Very few Early Stone Age sites are on record for Mpumalanga and no *in situ* sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

The MSA has not been extensively studied in Mpumalanga but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present) while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). Some isolated finds were recorded by Van Vollenhoven (1992) and Huffman (1999) in the larger study area.

The Later phases of the Stone Age began at around 20 000 years BP. This period was marked by numerous technological innovations and social transformations within these early hunter-gatherer societies. These people may be regarded as the first modern inhabitants of Mpumalanga, known as the San or Bushmen. They were a nomadic people who lived together in small family groups and relied on hunting and gathering of food for survival. Evidence of their existence is to be found in numerous rock shelters throughout the Eastern Mpumalanga where some of their rock paintings are still visible. A number of these shelters have been documented throughout the Province (Bornman, 1995; Schoonraad in Barnard, 1975; Delius, 2007). These include areas such as Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg and Ohrigstad.

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. No Sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The same goes for the Later Iron Age period where the study area is situated outside the western periphery of distribution of Late Iron Age settlements in Mpumalanga. This phase of the Iron Age (AD 1600-1800's) is represented by various tribes including Ndebele, Swazi, BaKoni, Pedi marked by extensive stonewalled settlements found throughout the Mpumalanga escarpment. Late Iron Age sites that have been identified in the larger geographical area is to the west of Bronkhorstspuit and in the vicinity of Bethal (Bergh 1999). No major black tribes seem to have settled very close to the area where Witbank is located today by the start of the nineteenth century, but the Phuthing Tribe was prominent in the area to the north thereof. (Bergh 1999).

Since the mid 1800's up until the present, South Africa had been subdivided into various different districts. Since 1945, the area where the modern-day Witbank area is located formed part of the Lydenburg district. As of 1872, the farm area was located within the Middelburg district. The Witbank district was however proclaimed in 1925, and the farms were located in this area. As of 1977 the farm fell under the jurisdiction of the Witbank Magisterial Area. This was still the case by 1994 (Bergh: 17, 20-27).

When writing about the Mpumalanga Province, it is perhaps best to briefly glance back to prehistoric times, when coals formed in vast swamps from rotting forests between 200 and 300 million years ago. Massive seams of vast coal fields have been discovered and extracted in the southern areas in the province. The areas surrounding the towns of Witbank, Middelburg, Bethal, Hendrina, Ermelo and Carolina had long provided South Africa with an abundant source of cheap energy. This discovery has also had unfortunate effects on these areas, since the toxic by-products of burning coal in such quantities had severely polluted the ground and atmosphere in this area. (*Mpumalanga* 2007: 36-37)

In a few decades, the sociographic nature of the then Transvaal province would change forever. The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Geskiedenisatlas van Suid-Afrika 1999: 109-115) It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119) Mzilikazi and his raiders had moved from the Northern Nguni area to the area north of the Vaal River by 1821. It has been recorded that the Ndebeles first attacked the Phuthing tribe, which in turn migrated to the south of the Vaal River and joined groups of Southern Sotho speakers. The Phuthing and Southern Sotho tribes moved westward and northward and started raiding Tswana communities in the surrounding area. The Phuthing were commanded first by Chief Tshane, and later Ratsebe. As the Phuthing under Ratsebe moved eastwards along the Vaal River, they collided with Mzilikazi's Ndebele once more. The Phuthing and other raiding groups were finally taken captive in 1823 by Mzilikazi's men. (Bergh 1999: 110-111) It is unlikely that these events would have had a great influence on the area where the farms under investigation are located today, but it is still important to understand the social dynamics of the larger area.

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa – some as early as in the 1720's. One such an adventurer was Robert Scoon, who formed part of a group of Scottish travellers and traders who had travelled the northern provinces of South Africa in the late 1820s and early 1830s. Scoon had gone on two long expeditions in the late 1820s and once again ventured eastward and northward of Pretoria in 1836. During the latter journey, he passed by the area where Witbank is located today. (Bergh 1999: 13, 116-121)

By the late 1820's, a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39) As can be expected, the movement of whites into the northern provinces would have a significant impact on the black people who populated the land. By 1860, the population of whites in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would later be entrenched as legislation during the period of apartheid had already been developed. (Bergh 1999: 170)

Much can be said about the systematic oppression of black people in South Africa. In 1904 about a half of the black population in the Transvaal was living on private land, owned by whites or companies. According to the Squatters' Law of 1895, no more than five families of "natives" could live on any farm or divided portion of a farm, without special permission of the Government in the Transvaal. (Massie 1905: 97)

Black and white relations were however at times also interdependent in nature. After the Great Trek, when white farmers had settled at various areas in the northern provinces, wealthier farmers were often willing to lodge needy white families on their property in exchange for odd jobs and commando service. This bywoner often arrived with a family and a few cows. He would till the soil and pay a minimal rent to the farmer from the crops he grew. The farmer did not consider him a laborer, but mostly kept black workers for hard labour on the farm. After the Anglo-Boer War, many families were left destitute. Post war years of severe droughts and locust plagues did not ameliorate this state of affairs. All of these factors resulted in what became known as the 'poor white problem'. On the advent of commercial farming in South Africa, white landowners soon found bywoners to be a financial burden, and many were evicted from farms. In many cases, wealthier landlords found it far more profitable to rent their land to blacks than to bywoners. This enabled them to create reservoirs of black labour (for which mine recruiting agencies were prepared to pay handsome commissions), while it was also possible to draw more rent from their black tenants. This practice was outlawed by the 1913 Natives Land Act, which forbade more than five black families from living on white farms as peasant squatters. (Readers Digest 1992: 329-332)

The discovery of diamonds and gold in the northern provinces had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonized the Cape and



Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977)

During the British march into the Transvaal between February and September 1900, several troops passed by the area where Witbank is situated today. The battalions of Lieutenant Generals J. French, R. Pole-Carew and F. Roberts all travelled close by the Witbank area and through Middelburg. A railway line ran along this route at the time. (Bergh 1999: 51)

During the Anglo-Boer War, two railway stations were located in the vicinity of the Witbank area, and close to each a black concentration camp had been established. At Middelburg, about 20 kilometres to the east of Witbank, one white and one black concentration camp was also set up. No skirmishes took place in the direct vicinity of the farm area. (Bergh 1999: 54).

An Anglo-Boer war battle took place on the farm Donkerhoek, only a few kilometres to the west of where the development is to take place. The battle lasted between 11 and 12 June 1900. Other skirmishes also took place here during this war (Bergh 1999: 52-53). Blockhouses were also erected in the vicinity by the British (Van Vollenhoven & Van den Bos 1997: 42-46).

## 5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed power station and transmission lines the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposits;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined/is known);
- » The preservation condition of the sites;
- » Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- » Its importance in/to 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;
- » Sites of significance relating to the history of slavery in South Africa.

## 5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and approved by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 9 of this report.

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

## 5.2 Impact Rating of Assessment

The criteria below are used to establish the impact rating of a site. as provided by the client:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
  - \* the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - \* the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - \* medium-term (5-15 years), assigned a score of 3;
  - \* long term (> 15 years), assigned a score of 4; or
  - \* permanent, assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight

impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.

the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

## **6. BASELINE STUDY-DESCRIPTION OF SITES**

The study area is characterised by typical Highveld landscape with grass cover and clusters of pioneer species. The "Brugspruit" traverses the study area in a north south direction with a smaller non perennial stream draining into the Brugspruit. Vegetation is extremely dense in these areas and limited archaeological visibility. In other portions of the study area the grass recently burned down and visibility was much higher in these areas. Previous and current land use activities impacted on the study area and the impacts of quarry's and agricultural activities is clearly visible

The demolished remains of structures are found scattered over the area, but nothing is left of these structures apart from cement slabs. These sites are of no significance as nothing is left of the structures to mitigate or interpret and no further action is necessary for these sites. A Single standing modern face brick, utility building is located in site alternative 4.

According to personnel from Transalloys two initiation sites occur in the study area, although they are located outside of any of the four alternatives their location was recorded. Lastly a large cemetery was recorded but is also located outside of the site alternatives.

## 6.1 Site Distribution Map

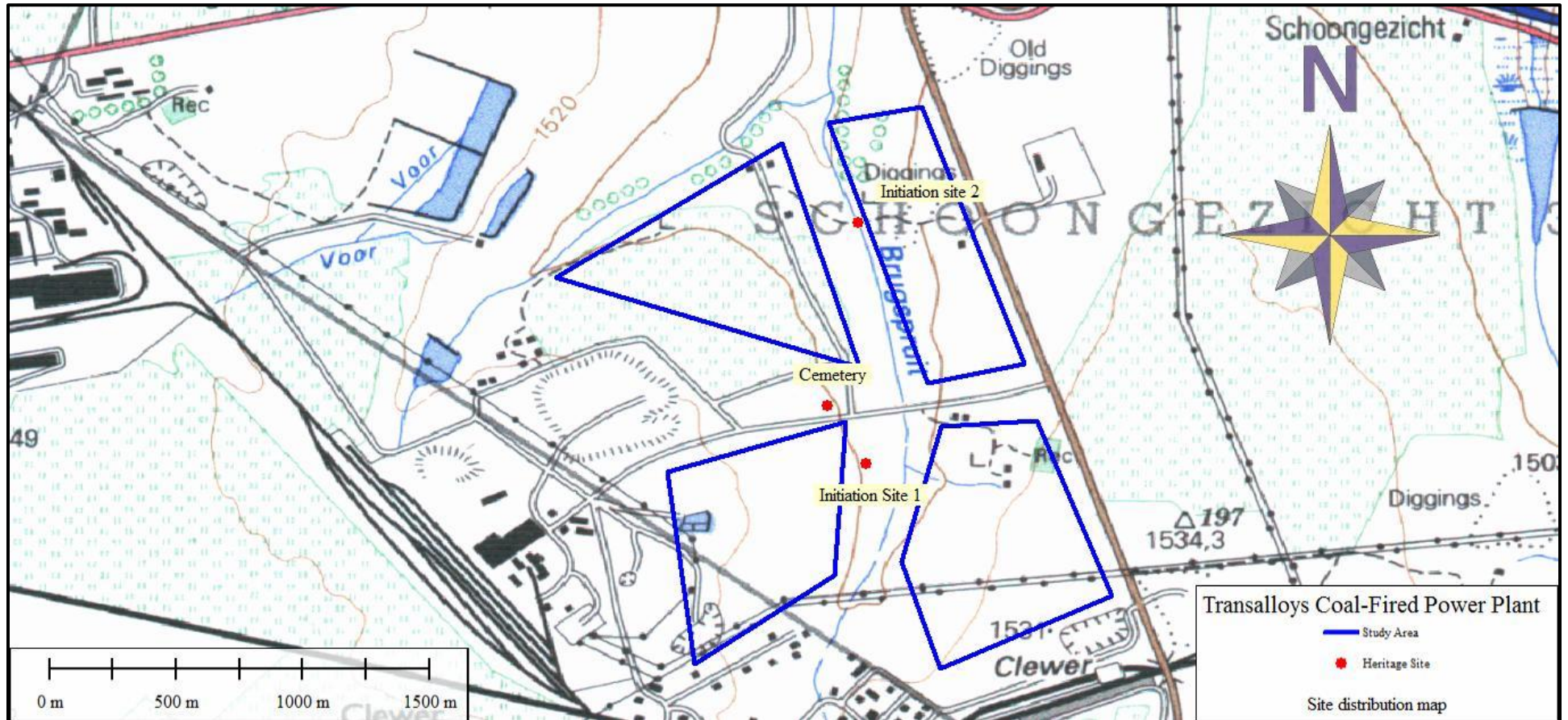


Figure 3: Showing the location of the recorded sites in relation to the proposed power station site alternatives.

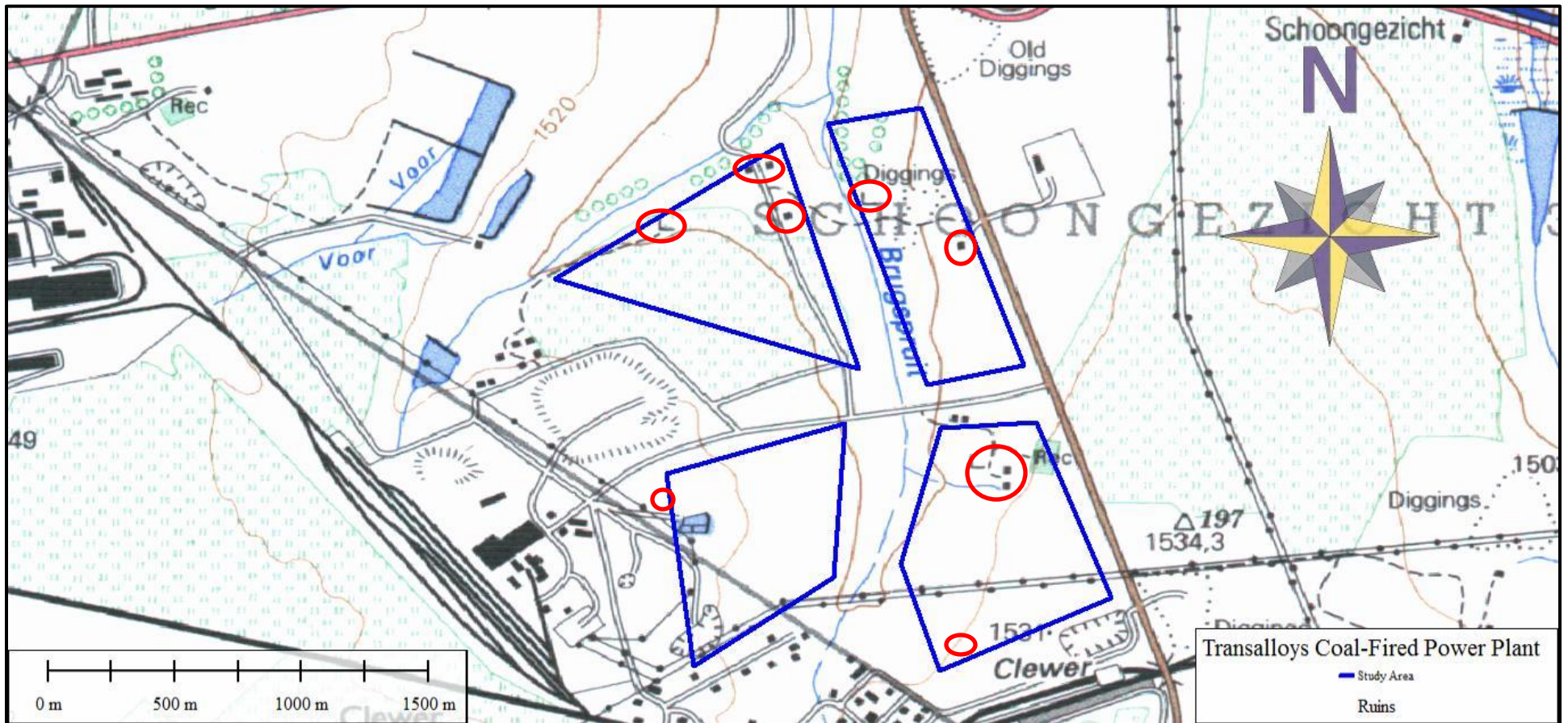


Figure 4: Showing the location of demolished buildings in relation to the proposed power station alternatives.



Figure 5. Environment in site alternative 2.



Figure 6. Environment in site alternative 1.



Figure 7. Dense vegetation in certain areas.



Figure 8. Environment in site alternative 4.





Figure 9. Remains at WPT 320.



Figure 10. Remains at WPT 321.



Figure 11. Remains at WPT 327.



Figure 12. Modern building in site alternative 4.

### 6.2. Sites with Coordinates

Site Number	Type Site	Markers	Co ordinate	Location
<b>Cemetery</b>	Historical and modern	Grave markers.	S25 53 25.9 E29 07 40.0	Not located within a proposed alternative
<b>Initiation site 1</b>	Intangible Heritage	Thick bush next to river	S25 53 33.2 E29 07 45.0	Not located within a proposed alternative
<b>Initiation site 2</b>	Intangible Heritage	Bridge	S25 53 02.5 E29 07 43.9	Not located within a proposed alternative

### 6.3. Demolished structures with Coordinates

WPT nr	Type Site	Markers	Co ordinate	Location
320	Demolished structures	Cement slabs and concrete. Possibly mining related.	S25 53 37.7 E29 07 19.4	Site Alternative 2
321	Demolished structures	Pile of bricks and cement slabs. Sites like these might contain unmarked graves  2 large stone heaps possibly associated with clearing of fields for ploughing	S25 53 02.3 E29 07 21.1  S25 52 59.3 E29 07 22.5	Site Alternative 1
322	Demolished structures	Concrete and cement	S25 52 55.7 E29 07 31.5	Site Alternative 1
323	Demolished structures	Cement and some bricks	S25 52 59.1 E29 07 34.6	Site Alternative 1
327	Demolished structures	Concrete foundations. Complex of structures, possibly farm house and labourer dwellings.	S25 53 33.2 E29 08 02.6	Site Alternative 3
328	Demolished structures	Stone circle with concrete on top and cement slabs. Sites like these might contain unmarked graves	S25 53 56.7 E29 07 56.2	Site Alternative 3

### 6.3. Site Descriptions

#### 6.3.1. Initiation site 1 and 2

<b>Site Number</b>	Initiation site 1 and 2	<b>1:50 000 map nr</b>	2529 CC
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Intangible heritage		
<b>Site categories</b>	Initiation Site		
<b>Context</b>	<p>Both sites were pointed out to the author by a Transalloys employee Mr. Thys Knoetze.</p> <p><b>Initiation site 1</b> is located on the western bank of the "Brugspruit" with in a cluster of wattle trees. No features occur in this area but according to Mr Knoetze the site is visited approximately every 3 years by Ndebel and Sotho participants.</p> <p><b>Initiation site 2</b> is located at a low water bridge over the "Brugspruit". According to Mr. Knoetze the site is visited yearly by Pedi participants. At the time of the survey no one was attending a initiation school at any of the two sites.</p> <p>Both sites are located outside of any of the proposed alternatives and no direct impact is foreseen on the sites.</p>		
<b>Cultural affinities, approximate age and significant features of the site;</b>	<p>Site 1 – Pedi</p> <p>Site 2. – Ndebele/Sotho</p>		
<b>Description of artefacts</b>	Modern artefacts, such as wire, glass and cans, are scattered over the sites.		
<b>Statement of Significance (Heritage Value)</b>	The sites are of high social significance.		

## Initiation Site 1 and 2

### Impact evaluation of the proposed project on heritage resources

**Nature:** No direct impact is expected for the sites as the sites are located outside of the proposed development area.

	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Low (3)	Low (3)
<b>Probability</b>	Not Probable (1)	Not Probable (1)
<b>Significance</b>	<b>Low (10)</b>	<b>Low (9)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	

**Mitigation:** (Please refer to section 7 for full details on recommendations).

**Cumulative impacts:**

The sites will not be impacted on by the development and no cumulative impact is foreseen.

**Residual Impacts:**

Historical and cultural sites are non-renewable and impact on any historical feature or material will be permanent and destructive.

### 6.3.2. Cemetery

<b>Site Number</b>	Cemetery	<b>1:50 000 map nr</b>	2529 CC
<b>Site Data</b>	<b>Description:</b>		
<b>Type of site</b>	Open site		
<b>Site categories</b>	Cemetery		
<b>Context</b>	<p>This is the location of a cemetery containing approximately 100 graves. The graves are all aligned east west with various types of grave dressing and headstones consisting of cement borders with headstones, stone packed with or without headstones, granite borders, soil heaps and headstones and heaps of brick. A number of them are fenced in with several child graves marked by small mounds of soil. Surnames identified include Gasibone, Mdlalose, Masilela, Blom and Mokoena. The site is located outside of any of the four alternatives and a secondary impact is foreseen on the site.</p>		
<b>Cultural affinities, approximate age and significant features of the site;</b>	The oldest visible date of death inscribed on a headstone is 1947 and the youngest 1960.		

**Photographs**



Figure 13: Children's graves.



Figure 14: General site conditions.

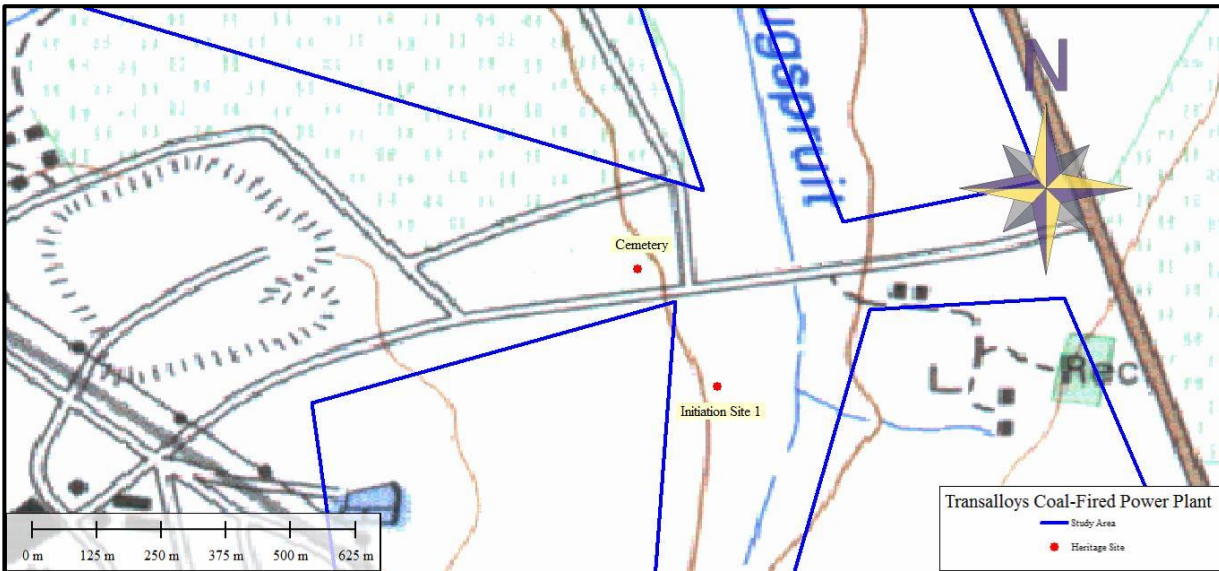


Figure 15: Grave in relation to development footprint.

<p><b>Field Rating</b> (Recommended grading or field significance) of the site:</p>	<p>Generally Protected A</p>
<p><b>Statement of Significance (Heritage Value)</b></p>	<p>High social significance</p>

### Impact evaluation of the proposed project on heritage resources

<b>Nature:</b> During the construction and operation of the project a secondary impact is expected for the site.		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (2)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	High (8)	High (8)
<b>Probability</b>	Not Probable (1)	Not Probable (1)
<b>Significance</b>	<b>15 (Low)</b>	<b>14 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	Yes	
<b>Mitigation:</b> The site is located outside of the development footprint of any of the alternatives and no direct impact is foreseen on the site. However to protect the site from accidental damage it should be fenced off during construction with an access gate for family members. (Please refer to section 7 for full details on recommendations).		
<b>Cumulative impacts:</b> If the mitigation recommendation is followed and the site is preserved no cumulative impact is foreseen on graves in the area.		
<b>Residual Impacts:</b> Archaeological and cultural sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		

## 7. CONCLUSIONS AND RECOMMENDATIONS

Within the four site alternatives investigated for the proposed power station the demolished remains of several structures were identified. Due to the extent of the destruction to these structures they are of no heritage significance. It must however be mentioned that sites like these might be associated with unmarked graves. Two initiation sites were also recorded on the banks of the "Brugspruit" as well as a large informal cemetery. None of these three heritage sites are located within the proposed site alternatives and no direct impact is foreseen on these sites.

Currently site alternative 1 is considered for the power plant and alternative 2 for the ash disposal site. From a heritage perspective the ash disposal facility within alternative two is favourable as no sites or demolished structures occur in the proposed footprint (figure 16). The plant itself (Figure 17) that is located in alternative 1 have the remains of two demolished structures (WPT 321 & 322). There is nothing left of these structure and they do not have conservation value.



Figure 16: Recorded finds in relation to the proposed ash disposal site





Figure 17: Recorded finds in relation to the site layout in alternative 1.

No fatal flaws were identified during the AIA and subject to approval from SAHRA there is from an archaeological point of view no reason why the development should not proceed if the following recommendations are adhered to.

- Although the cemetery is located outside of the proposed impact area a influx of people and construction vehicles are expected, it is recommended that the site is fenced with an access gate for family members.
- Both initiation sites are located outside of the proposed site alternatives and no direct impact is foreseen on the sites. The location of these sites should how ever be noted by the planning team in any future expansions in the area. These areas should also be avoided by Transalloys employees during initiation school times. This should be easily achievable as there is a high level of security for the power station and employee's movements will be restricted within the fenced in areas.
- As part of the social consulting process, the absence of graves in the proposed alternatives must be confirmed.
- If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

## **8. PROJECT TEAM**

Jaco van der Walt, Project Manager

## **9. STATEMENT OF COMPETENCY**

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

I have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique and Tanzania as well as the DRC; and have conducted more than 300 AIAs since 2000.

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