



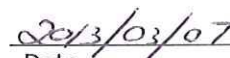
Transnet Capital Projects  
Ngqura 16 MTPA  
Phase 1 Heritage Impact Assessment - Borrow Pit areas between Kimberley to De Aar  
2013 01 28

**Transnet Capital Projects  
Ngqura 16 MTPA**


**Phase 1 Heritage Impact Assessment - Borrow Pit areas between  
Kimberley to De Aar**

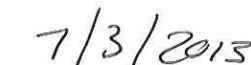
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## 1. Introduction

The Phase 1 Heritage Impact Assessment (HIA) focused upon the description and assessment of the proposed borrow pit areas at Heuningneskloof and Belmont. The purpose of this Phase 1 HIA report is to determine if and where heritage resources are positioned within the proposed development footprint.

The gathering of information will allow for the buffering of sensitive areas, and the creation of and the delineation of no-go sites. The Phase 1 HIA will inform the South African Heritage Resources Agency (SAHRA) what the development entails, any areas of concern and issues that require legal input from SAHRA's statutory body.

The purpose of the heritage resources impact report is to provide Ngwao Boswa Kapa Bokoni (Northern Cape Provincial Heritage Resources Agency) and the South African Heritage Resources Agency (SAHRA) with a background in terms of the type of works that are proposed at the borrow pit areas and to provide suggestions regarding mitigation procedures.

## 2. Background

The proposed Ngqura 16 Mtpa railway upgrade stretches across 800km from Hotazel in the Northern Cape to the Port of Ngqura in the Eastern Cape. To allow for a manageable Phase 1 Heritage Impact Assessment to be completed, it was decided to divide the scope of work into three different areas that are listed as follows:

- Area 1: Hotazel to Kimberley
- Area 2: Kimberley to De Aar
- Area 3: De Aar to Port of Ngqura

Areas 1 and 3 are managed within a current Environmental Impact Assessment process, meaning that the Phase 1 HIA forms part of a specialist study period. Area 2 has already been authorised by the Department of Environmental Affairs in 2009 and as a result no further environmental studies are required in this specific area.

In 2008 a Phase 1 HIA undertaken by Archaic formed part of the Environmental Impact Assessment process and identified a range of stone age, rock art and historical sites. The Phase 1 HIA report included all three sections identified by the proposed scope of works. The National Department of Environmental Affairs (DEA), as the competent authority, authorised the project prior to receiving comments from SAHRA who subsequently indicated shortcomings in the assessment which need to be addressed. The 2008 Phase 1 HIA was reviewed to identify areas of concern at Heuningneskloof and Belmont. The 2008 Phase 1 indicated that Rock Art Engravings are situated, 6km north of Belmont and 7km south of Belmont (Archaic, 2008). Both of these sites fall outside of the proposed development footprint.

In addition Hatch has reviewed the 2008 Phase 1 HIA assessment and has undertaken a gap analysis to identify where further studies are required. The gap analysis identified that most of the 2008 archaeological report findings were located outside of the development area and that

no heritage resources of significance were identified within the railway reserve alignment. The results showed that further heritage investigations (palaeontology, structures, historical and living heritage) are required to have a clear understanding of the range of heritage resources that exist alongside / within the proposed development route. The main focus of the assessment was on identifying areas where borrow pit activities may impact on potential heritage resources.

A Phase 1 HIA fieldwork was completed during 2012 that identified heritage resources that are of significance and situated within the railway reserve areas. The Phase 1 HIA provided insight into the heritage resources areas that may be under threat and could be disturbed if any type of development occur. The Phase 1 HIA was used to guide the decision making process in terms of the placement of proposed borrow pits. It was emphasised that areas that are already disturbed should be used for the excavation of borrow pit material than new areas to prevent the unnecessary loss of heritage artefacts that are situated in situ. A list of coordinates were placed on a Google map indicating sites that have been recorded during a 2009 study and also during 2012. The Hatch engineering team has decided on the location of borrow pit areas by liaising with the professional archaeologist to ensure that these development sites are placed away from sensitive heritage resources.

In terms of the SAHRA regulations borrow pit applications must be lodged on the SAHRIS system separately from the other EIA applications. This report will be attached to the Environmental Management Plan prepared for the borrow pit areas at Heuningneskloof and Belmont.

### **3. Project Scope**

The information below provides a summary of the proposed works at the various sections to upgrade the existing line to support 200 wagon trains. The areas are divided into three different sections namely Hotazel to Kimberley, Kimberley to De Aar and De Aar to Port of Ngqura. The focus of this report is to determine the impact that the proposed borrow pit development may have on heritage resources that may be located at Heuningneskloof and Belmont.

The purpose of borrow pits is to obtain suitable material to be used for earthworks construction. The Belmont borrow pit is required for earthworks material for construction of railway formations, construction of level crossing ramps and use in the formation subsidence repair between Modderivier and Heuningneskloof whereas the Heuningneskloof borrow pit is required for earthworks material for the formation subsidence repair of the lines between the Modderivier and Heuningneskloof crossing stations.

The section below describes the type of engineering work that is required to upgrade the proposed Ngqura 16 Mtpa railway line.

#### **3.1 Proposed Borrow Pit Activities**

The type of activities associated with the development of borrow pit area are inclusive of the following:

- Staking out of the borrow pit area before vegetation clearance from the site
- Topsoil will be removed to a depth of 300 mm and stockpiled separately from the other soil layers

- Excavation of materials by ripping and loading with the excavator directly onto the haul vehicle
- Transportation of the excavated material along the existing gravel road that is located alongside the existing railway line
- Material that is not suitable to be used as borrow pit material will be stockpiled separately and used for rehabilitation of the site.

### 3.1.1 The Size and Footprint of the Proposed Borrow Pit Sites

The expected borrow pit dimensions for the Heuningneskloof borrow pit are as follows:

- Footprint in hectares: 4ha
- Maximum depth in metres: 3m
- Anticipated volume in cubic metres: 100 000m<sup>3</sup>

The expected borrow pit dimensions for the Belmont borrow pit are as follows:

- Footprint in hectares: 1.5ha
- Maximum depth in metres: 3m
- Anticipated volume in cubic metres: 34 000m<sup>3</sup>

### 3.1.2 Phases Associated with Borrow Pit Developments

- The construction phase that is associated with vegetation clearance and removal of topsoil to an approximate depth of 300mm
- The operation phase involves the excavation, stockpiling and removal of the borrow pit material
- Rehabilitation and closure that is aimed at restoration of the disturbed area.

### 3.1.3 Location of the Borrow Pit Sites

The proposed borrow pit sites are located at the areas described below.

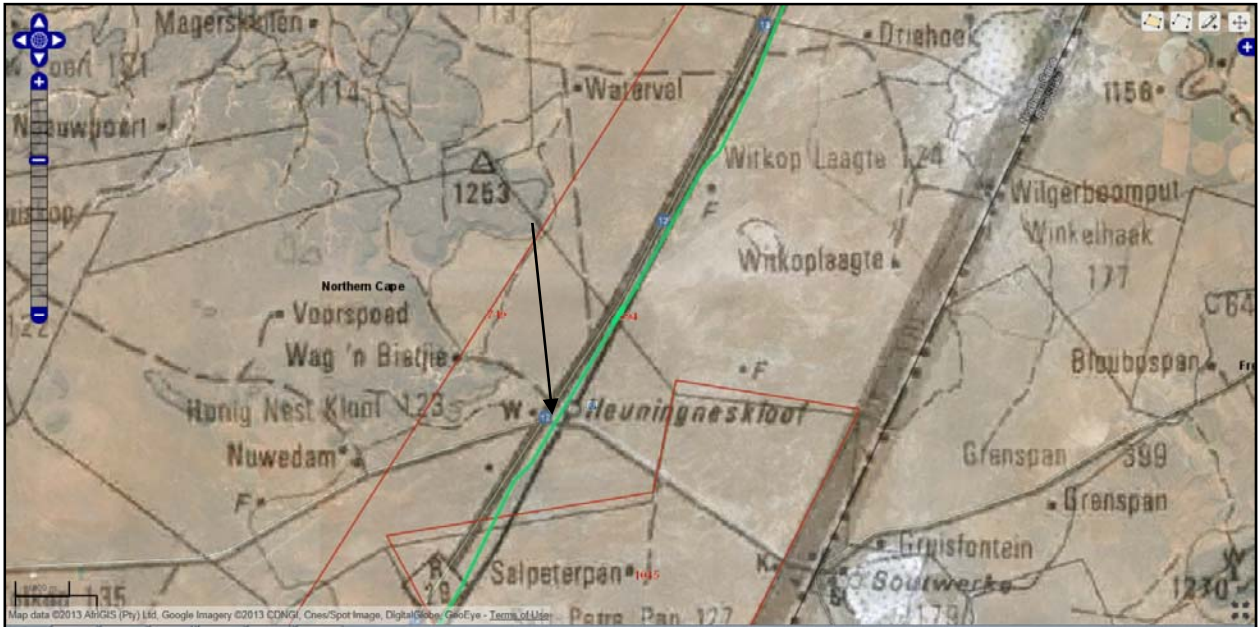
#### 3.1.3.1 Heuningneskloof

The Heuningneskloof borrow pit area is situated on the Farm Honig Nest Kloof 123 that is adjacent to the existing Kimberley to De Aar railway line. An existing borrow pit occurs at Heuningneskloof, but it was indicated that additional private land is required. The size of the proposed borrow pit is anticipated to be 4ha, of which 2.5ha could be private land. The neighbouring sites that may be affected are subsections 1 and 4 of Witkoplaagte.

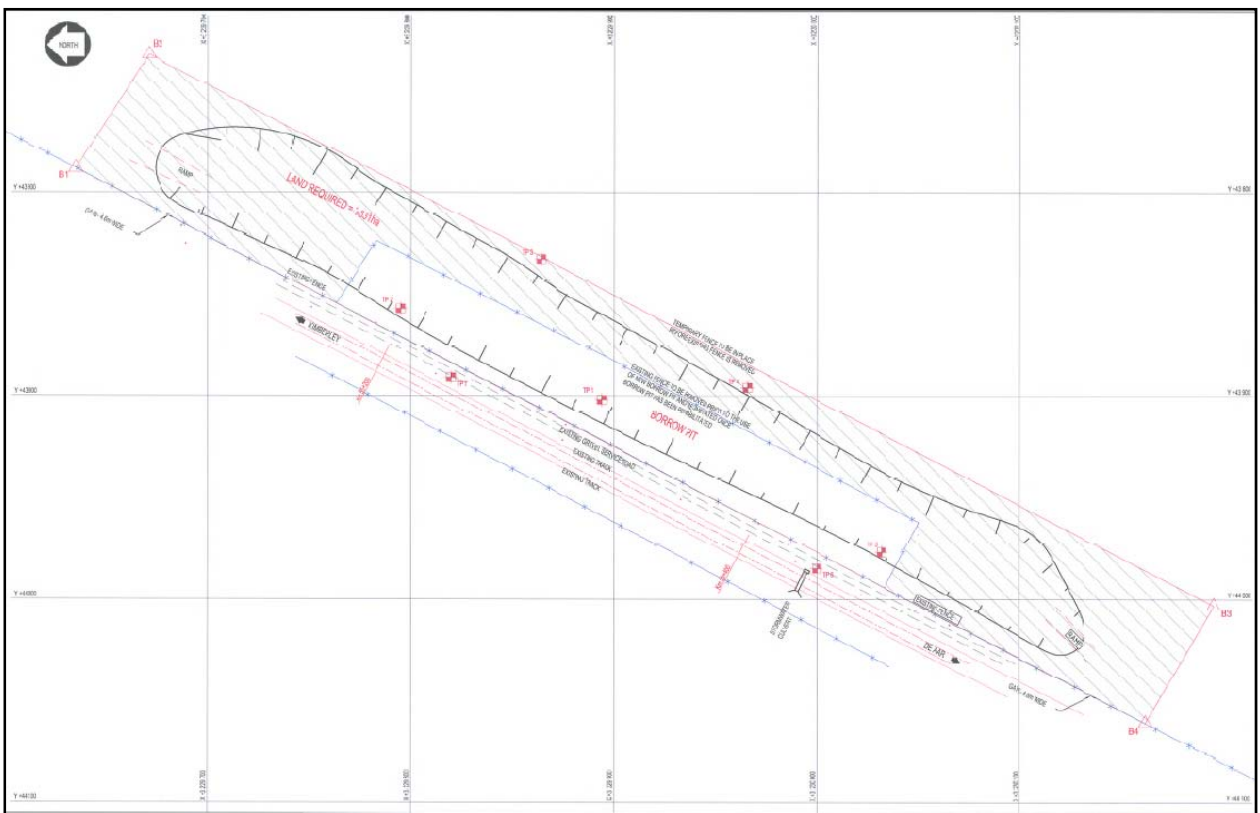
Heuningneskloof borrow pit area is an open surface area positioned within 20 metres of the railway line.

The location of the proposed borrow pit site is: 29°11'50.78"S 24°32'29.77"E

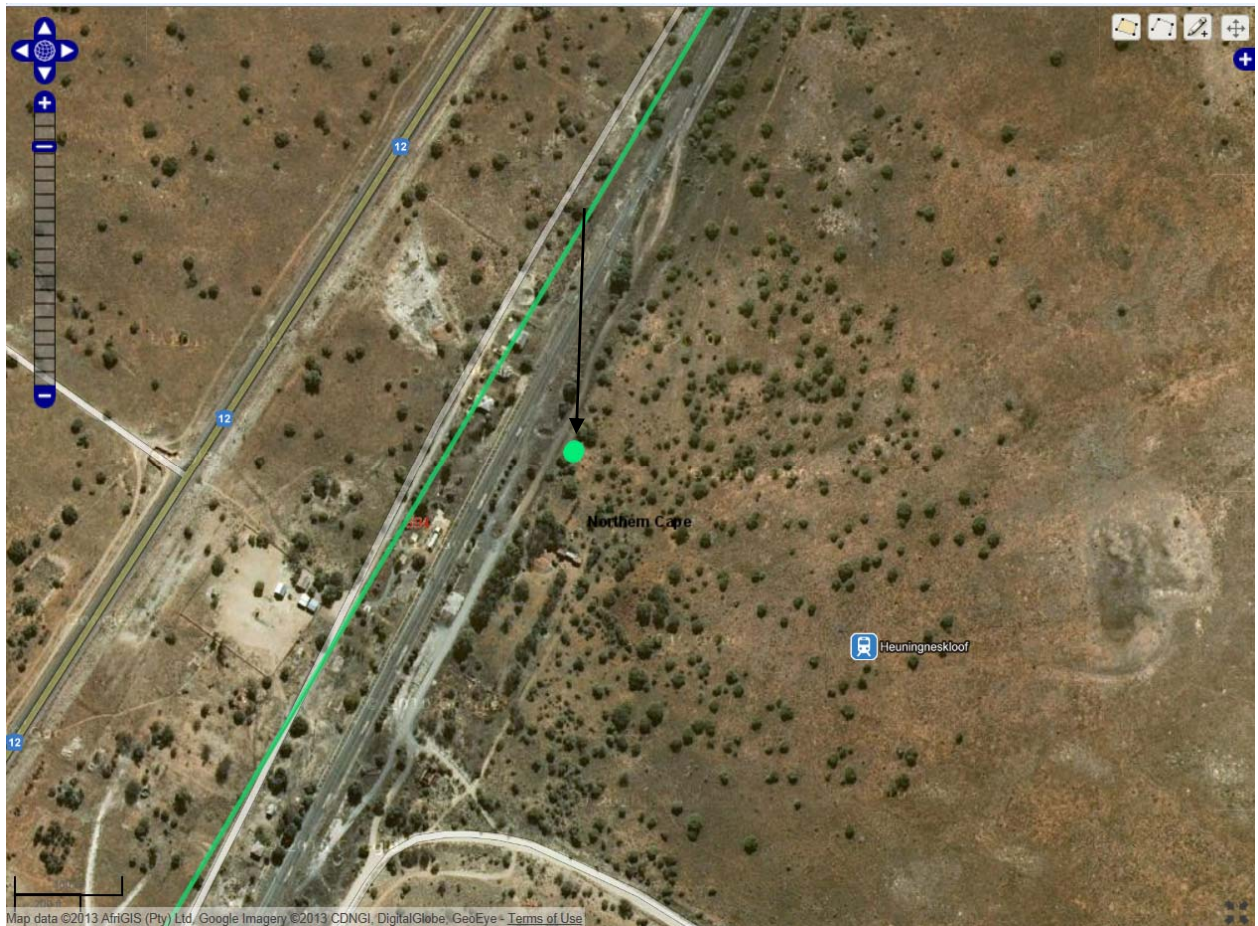
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**Figure 1: Heuningneskloof borrow pit area (SAHRIS, 2013)**



**Figure 2: Heuningneskloof borrow pit sketch plan (Transnet, 2012)**

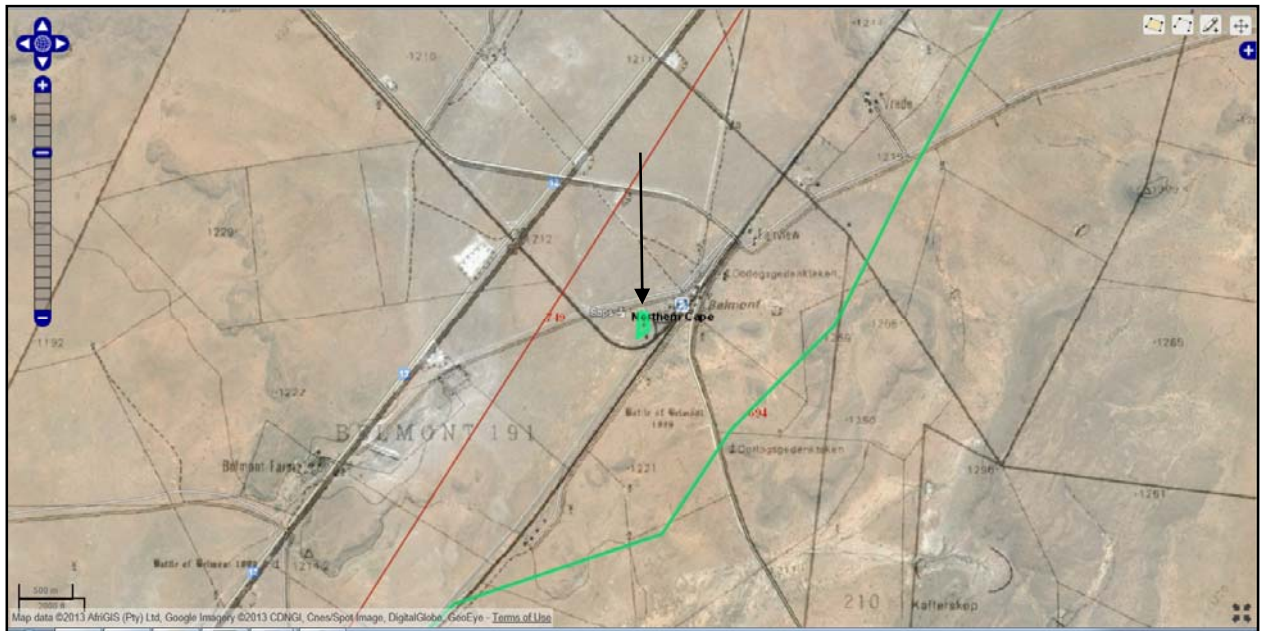


**Figure 3: Aerial view of the Heuningneskloof borrow pit area ( SAHRIS, 2013)**

### 3.1.3.2 Belmont

The proposed borrow pit area is situated on the farm Belmont 191 and is located within the railway reserve that is owned by Transnet. The proposed development site is situated within a 100 to 200 metres of the existing railway reserve line. The existing borrow pit will be used and no additional private land will be required.

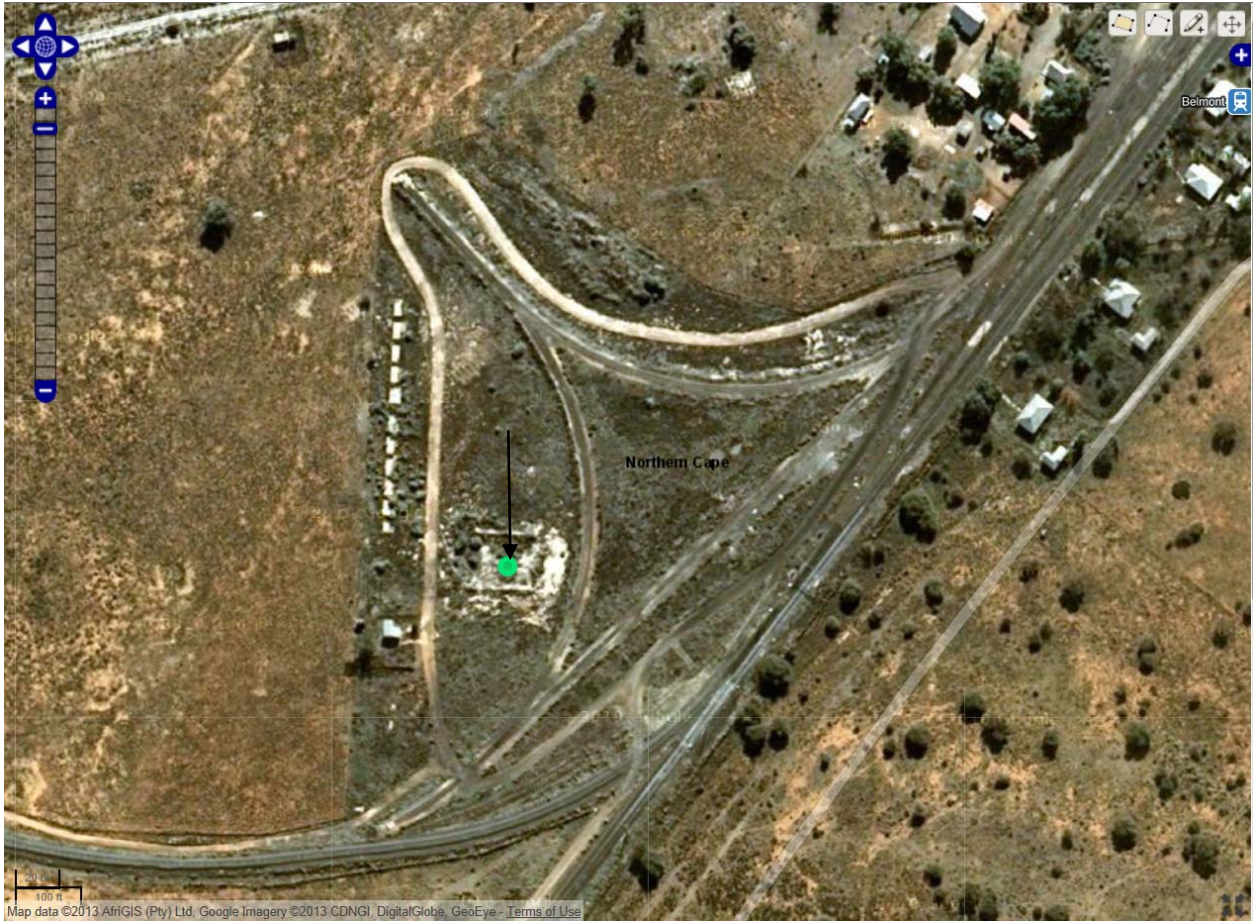
The location of the proposed borrow pit site is: 29°25'7.32"S 24°21'51.71"E



**Figure 4: Belmont borrow pit area (SAHRIS, 2013)**



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**Figure 5: Aerial view of the Belmont borrow pit area (SAHRIS, 2013)**

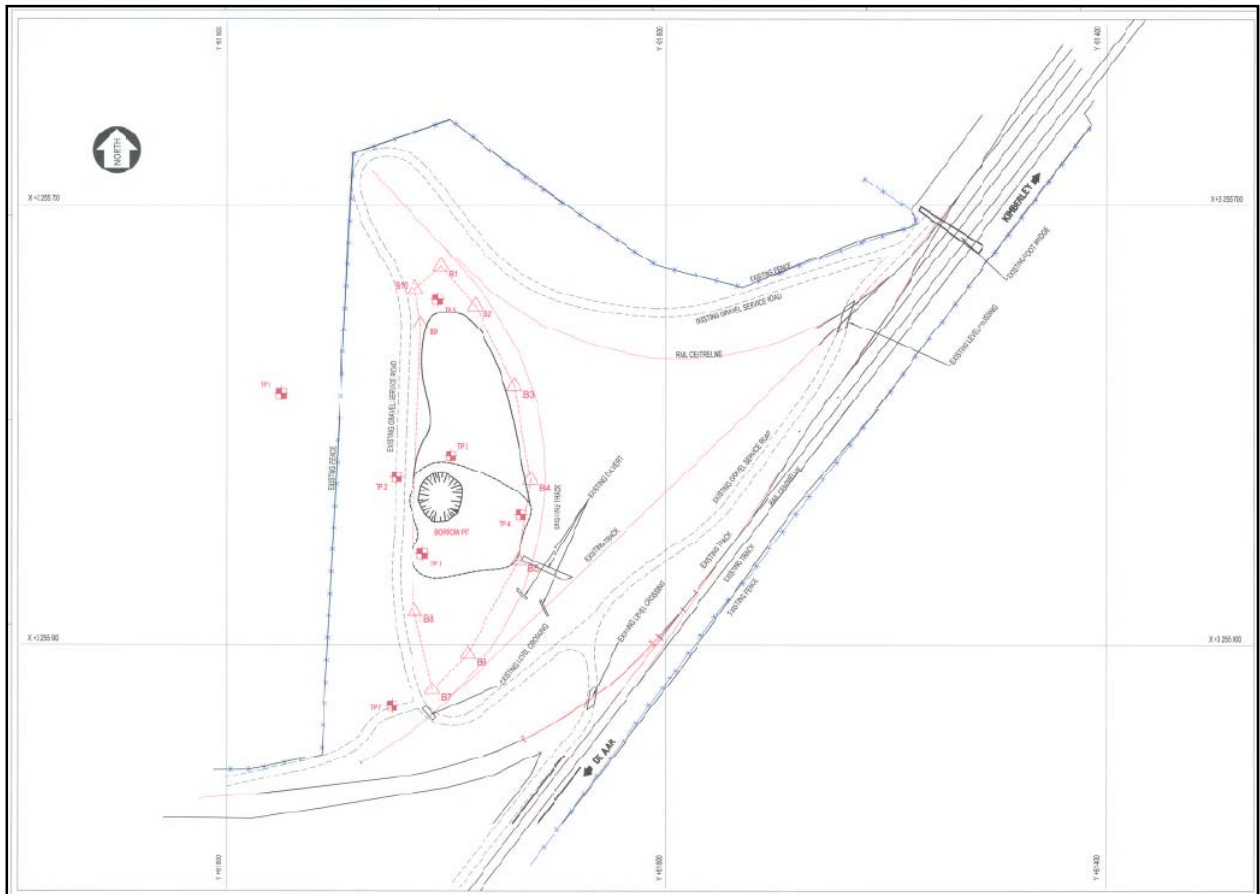


Figure 6: Sketch plan of Belmont Station borrow pit on Farm Belmont 191 (Transnet, 2012)

## 4. Approach

This section summarises the approach in determining potential heritage concerns at the borrow pit areas situated at Heuningneskloof and Belmont with construction likely to commence in the first quarter of 2013.

### 4.1.1 Terms of Reference

The specific terms of reference for the heritage impact assessment are as follows:

- Provide a description of the archaeology and cultural heritage of the project development route and identify / map any sites of archaeological and cultural significance that may be impacted by the proposed borrow pit development

- Undertake an archaeological reconnaissance survey <sup>1</sup> to assess the sensitivity and conservation significance of any sites of archaeological and cultural heritage significance affected by the proposed borrow pit development
- Make practical recommendations for the protection and maintenance of any identified and significant archaeological and cultural heritage sites that may be affected
- Provide guidance for the requirement of any permits from SAHRA and the Provincial Heritage Resources Authority (Ngwao Boswa Kapa Bokoni) that might be needed.

#### 4.1.2 Project Objectives

The specific project objectives are as follows:

- Identify major heritage resources issues that may result in a risk to the project or may be a potential fatal flaw
- Minimise the adverse impacts on heritage resources that are positioned on the surface or placed in situ
- Identify the areas where permanent removal of tangible as well as intangible heritage resources needs to be undertaken within a controlled environment and if such activity has an impact on the cultural characteristics of local traditional communities, that they will be compensated
- Avoid impacts on communities of Indigenous Peoples or minimise the impact as far as possible
- Respect and conserve the practices of Indigenous Peoples.

#### 4.2 Legislation and Guidelines

SAHRA is a statutory organisation established in terms of the National Heritage Resources Act (No. 25 of 1999) as the national body responsible for the protection of South Africa's cultural heritage resources. SAHRA' manages the administration of permits for:

- Destruction, alteration or demolition of structures older than sixty years
- Needs and desirability permits linked to development activities
- Sampling permits that allow the removal of heritage objects for research purposes or rescue archaeology
- Rock art documentation permits
- Grave exhumation and removal permits
- Archaeological excavation permits.

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<sup>1</sup> Archaeological reconnaissance is the attempt to locate, identify and record the distribution of archaeological sites on the surface and against the natural geographic as well as environmental background.

The need for input with respect to heritage resources is primarily triggered through statutory requirements, the nature and degree of the potential impact's significance, and concerns raised during the stakeholder consultation process (Provincial Government Western Cape, 2005).

It is the legal responsibility of the client to ensure that the cultural heritage, archaeological resources and paleontological sites that have been identified during the reconnaissance survey are protected and that the mitigation procedures are implemented. It is also the responsibility of the client to ensure that competent professionals are available to assist with the identification and protection of heritage resources.

## 5. Assumptions and Limitations

The following assumptions and limitations must be taken into consideration when reading this report.

### 5.1 Assumptions

The following assumptions are applicable based on the engineering scope of works:

- All work will stop until further advised by a professional archaeologist, in the event that heritage resources are uncovered during vegetation clearance and construction
- A professional archaeologist will be informed in the event that heritage objects are uncovered during earthmoving operations
- Monitoring will occur during construction to ensure that no heritage objects will be removed without properly recorded and transported to the heritage resources provincial recording institution that is McGregor Museum in this regard
- Stakeholder engagement will occur with the local authorities, property owners, museums, universities and interests groups.

## 6. Project Methodology

The methodology includes the following:

- Review of previous reports produced during the 2008 Phase 1 HIA study
- During the Phase 1 HIA, the area within the railway reserve areas and the immediate land was assessed to determine if any heritage resources may be affected by the proposed development
- Provision of a sensitivity map that will indicate the tangible and intangible heritage resources positioned alongside and within the proposed development area. The sensitivity map was developed based on the information gathered during the site visit as well as other reports
- Document, calculate and analyse the heritage resources identified during the reconnaissance survey to determine what constitutes a significant resource and how this can be managed
- List recommendations to inform the decision-making process

- Consult with local community members, authorities, museums, academic institutions and historical associations on a regular basis.

This is supported by the identification of previous heritage impact assessment reports completed in the past. The documents are reviewed to determine if any archaeological sites of importance or specific cultural landscapes have been discovered in the neighbouring areas that must be investigated. The coordinates identified in the heritage impact assessment reports are transferred to Google Earth Maps to establish if the identified heritage resources are positioned in the borrow pit development areas.

The background information stipulated above was used to determine which areas needed to be assessed and visited by undertaking a reconnaissance survey.

## 7. What is Cultural Heritage?

Cultural heritage resources are characterised by two different sub-disciplines which represent intangible and tangible heritage resources that define the field of heritage resources management. Tangible heritage resources can be documented using a quantitative method and intangible heritage resources are documented using a qualitative method. The list of heritage resources that are protected in terms of the National Heritage Act (No. 25 of 1999) is inclusive of the following:

- Tangible moveable and immovable objects
- Property sites, structures, or groups of structures older than sixty years
- Palaeontological sites and objects
- Archaeological sites and objects
- Physical landscape features for example sacred rocks, lakes and waterfalls
- Places of historic, cultural, artistic and religious value
- Unique natural features
- Intangible forms of culture that are inclusive of cultural knowledge, innovations and traditional lifestyles
- Cultural landscapes developed as a result of interactions between nature and man, are illustrative of the relationship that people / communities have with the natural environment (France\_UNESCO cooperation agreement, 2006) Cultural landscapes are a combination of trees, forest, rocks, hilltops and associations with sacred natural features. Cultural landscapes are also associated with areas linked to events of bravery, survival and remarkable human events.

### 7.1 Archaeological Time Periods

Heritage resources and cultural landscapes are linked to specific time periods. In summary the various eras are as follows:

- The Iron Age and farmer period occurred in southern Africa from Common Era (2000 years ago to 1950) to historical periods. The definition is divided between Early Iron Age (c. 200 CE to c. 1400 CE) and Late Iron Age (c. 1400 CE to 1800's (Archaic, 2008) The historical period indicate dates from 1500s to present ( Swanepoel N, Esterhuysen A and Bonner P, 2007). The Iron Age is defined as a time period that occurred during c. 200 to c. 1000 Common Era named as the early period and c. 1000 to 1800's Common Era (Archaic, 2008)
- The Stone Age time period is divided between three different time periods, namely:
  - ◆ Early: c. 2 500 000 to 150 000 Before Common Era
  - ◆ Middle: c. 150 000 to 30 000 Before Common Era
  - ◆ Late: c. 30 000 Before Common Era until the historical time periods commenced

## **8. Archaeological, Historical and Living Heritage Background of the Kimberley to De Aar Section**

The purpose of the section below is to provide an overview of the historical – archaeological background of the proposed borrow pit areas.

### **8.1 South Africa's Railway History**

South Africa's railway system dates back to the 1860's and is one of the largest on the African continent. The few lines originated in the 1870's to 1880's that was part of the historical time period associated with the finding of gold and diamonds. The various railway administrations and departments originated during the development of colonies as well as the Boer republics. These systems were combined in 1910 to develop one railway map ( De Jong R C, 2002).

The historical railway infrastructure played an extensive role during the South African War specifically related to the transport of wounded soldiers between Magersfontein, Heuningneskloof Graspan, Belmont and De Aar (Marais J J, 1977). The school at De Aar was changed into a hospital of where soldiers were treated (Marais J J, 1977).

### **8.2 The South African War**

The battle of Magersfontein was one of the three major British defeats that occurred during the South African War. Lord Methuen, with a 10 000 strong army left his camps at the Orange River on the 11<sup>th</sup> of November 1899 to march north along the railway line towards Kimberley (History of War, 2007).

Two victories occurred during this time at Belmont and Rooilaagte during 1899. The British had suffered during the Modderivier battle that occurred on the 28<sup>th</sup> of November even if the Boers retreated from the position (History of War, 2007). Methuen decided to allow his men to rest and wait for reinforcements. This resulted in the Boers to defend a position at Spytfontein closer to Kimberley (History of War, 2007). The Boers also wanted to block the railway between Modderivier Bridge and Kimberley.

## 9. Summary of Findings

The following section provides a summary regarding the type of heritage resources that have been identified in the vicinity of the borrow pit areas.

Belmont and Heuningneskloof are cultural landscape sites where significant South African War battles occurred from 1899 to 1902. Blockhouses, mounds and ditches occurred alongside the existing railway line during the South African War. These features do not occur at the proposed development areas, but they have been highlighted to explain the type of cultural landscape that surrounds the railway infrastructure.

Although most of the battles occurred at the hilltop areas, it is possible that artefacts related to this time period could be uncovered when earthmoving operations commence. Significant historical battlefield activity occurred next to the railway lines and bridges and during earthmoving operations heritage objects may be exposed.

### 9.1 Heuningneskloof

No heritage resources of significance were identified at the proposed borrow pit area. Historical structures occur at the railway station, but they will not be impacted by the proposed development.



**Figure 7: Historical structures are located west from the existing railway line at Heuningneskloof, but they will not be impacted by the proposed borrow pit development**



**Figure 8: Typical cultural landscape associated with the Heuningneskloof railway line and station area**

## **9.2 Belmont**

No heritage resources of significance have been identified at the existing borrow pit area. Belmont station has evidence of various historical railway structures, but they will not be impacted by the proposed development.





**Figure 9: Area situated west from the existing railway line at Belmont. Belmont Post Office is situated on the left side of this photograph**

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**Figure 10: Old railway structures are situated west from the existing railway line, but they will not be impacted by the proposed borrow pit development**



**Figure 11: The cultural landscape that surrounds the Belmont station area**



**Figure 12: Old railway structures are located at Belmont station, but they will not be impacted by the proposed borrow pit development**

## 10. Recommendations

The following recommendations are proposed to minimise the impact on potential heritage resources that may be discovered during commissioning of the borrow pit areas.

- Minimal impact on heritage resources sites

It would be ideal to limit the borrow pit areas at sites that are already disturbed. If this cannot be achieved, it is of importance that a professional archaeologist undertakes monitoring as discussed below

- Heritage Resources Assessment prior to earthmoving activities

An environmental control officer should monitor the sites during construction and request a professional archaeologist to consult in the event that any potential artefacts are uncovered

- If heritage objects need to be rescued a permit application must be completed and forwarded to SAHRA for approval. If a permit is issued by the relevant authority, sampling must be undertaken as soon as possible

- Rescue of heritage objects uncovered after construction commenced

Should heritage objects be identified after construction activities have commenced, it is compulsory that development stops at the specific area. The professional archaeologist and McGregor Museum must be contacted as soon as possible to inform them about the situation such that the site can be assessed. The archaeologist must record the type of heritage objects uncovered and forward the information to the national as well as provincial heritage resources authorities. The heritage resources authorities will decide on the way forward. Works at the specific section may only proceed with an approval letter from the South African Heritage Authority and Ngwao Boswa ya Kapa Bokone (Heritage Northern Cape)

- Heritage resources monitoring during construction

Once earthmoving activities commence, the professional archaeologist must monitor the borrow pit areas on a monthly basis and provide an audit report to the heritage resources authorities. This will provide SAHRA and Ngwao Boswa ya Kapa Bokone (Heritage Northern Cape) with an opportunity to comment on the status of the cultural environment and provide additional comments / requirements when necessary

- Heritage resources monitoring during the handover phase

During the handover phase a final monitoring report must be forwarded to the relevant authorities

- Approval from authorities

No borrow pit developments are allowed without the approval from the South African and Provincial Heritage Agencies. The approval will be in the format of a letter or permit document dependent on a decision made by the heritage resources authorities. The permits normally contain a list of terms and conditions that must be followed. Monitoring and auditing will be completed against a list of heritage resources management requirements

- Rehabilitation of borrow pits

A professional archaeologist must monitor the area during rehabilitation of the borrow pit sites. The cultural landscape will be disturbed during the development of borrow pits and as a result a detailed cultural landscape rehabilitation plan is necessary to guide the process when construction activities come to an end

- Heritage Resources education and training

Construction workers must be educated in terms of the type of heritage objects that may be discovered during earthmoving operations, who to contact in such an event and what to do before a professional archaeologist attend to the site.

## 11. Conclusion

In summary both borrow pit areas have been placed away from sensitive heritage resources sites and continuous liaison will occur between the engineering team and the professional archaeologist. The historical structures that are situated within the railway reserve areas, will not be impacted by the proposed development. Monitoring will occur during construction to ensure that if in situ archaeological material are uncovered, the artefacts are recorded within a professional manner.

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## Sensitivity Maps

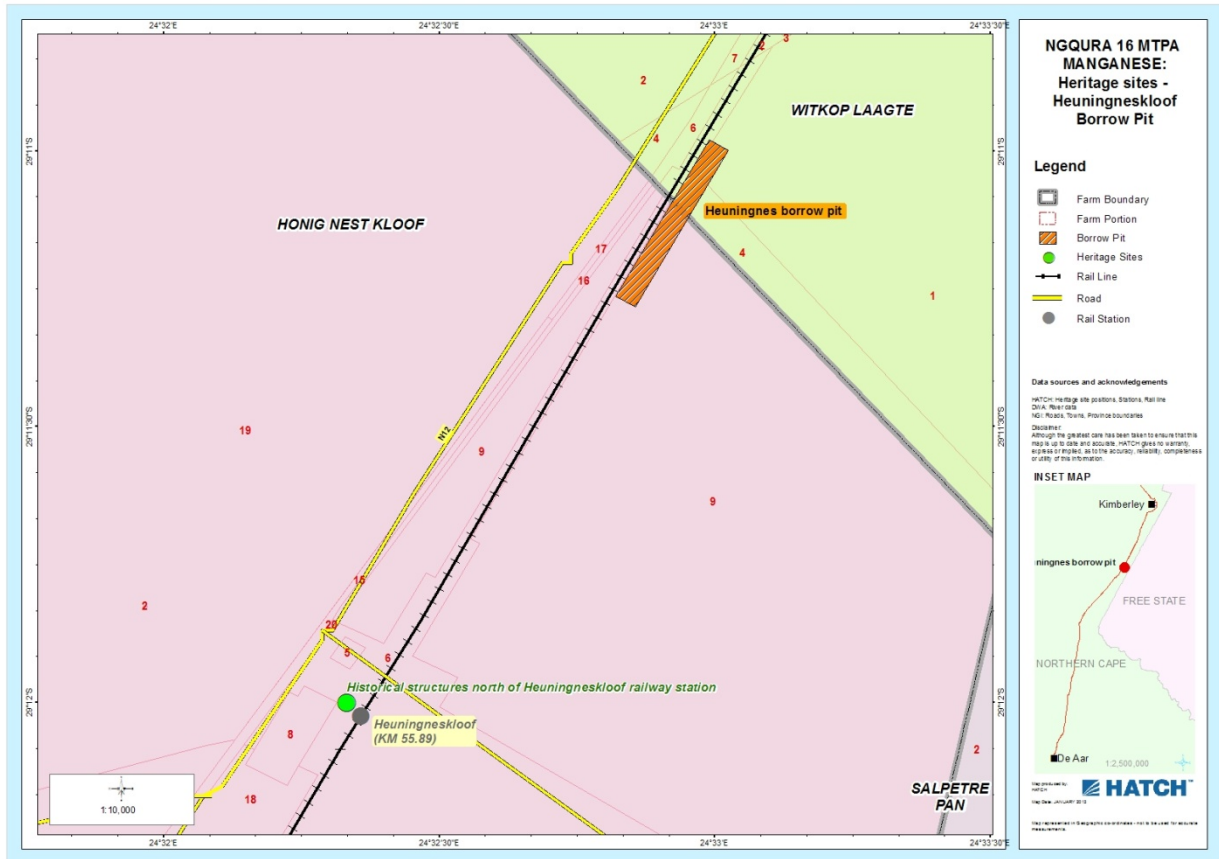
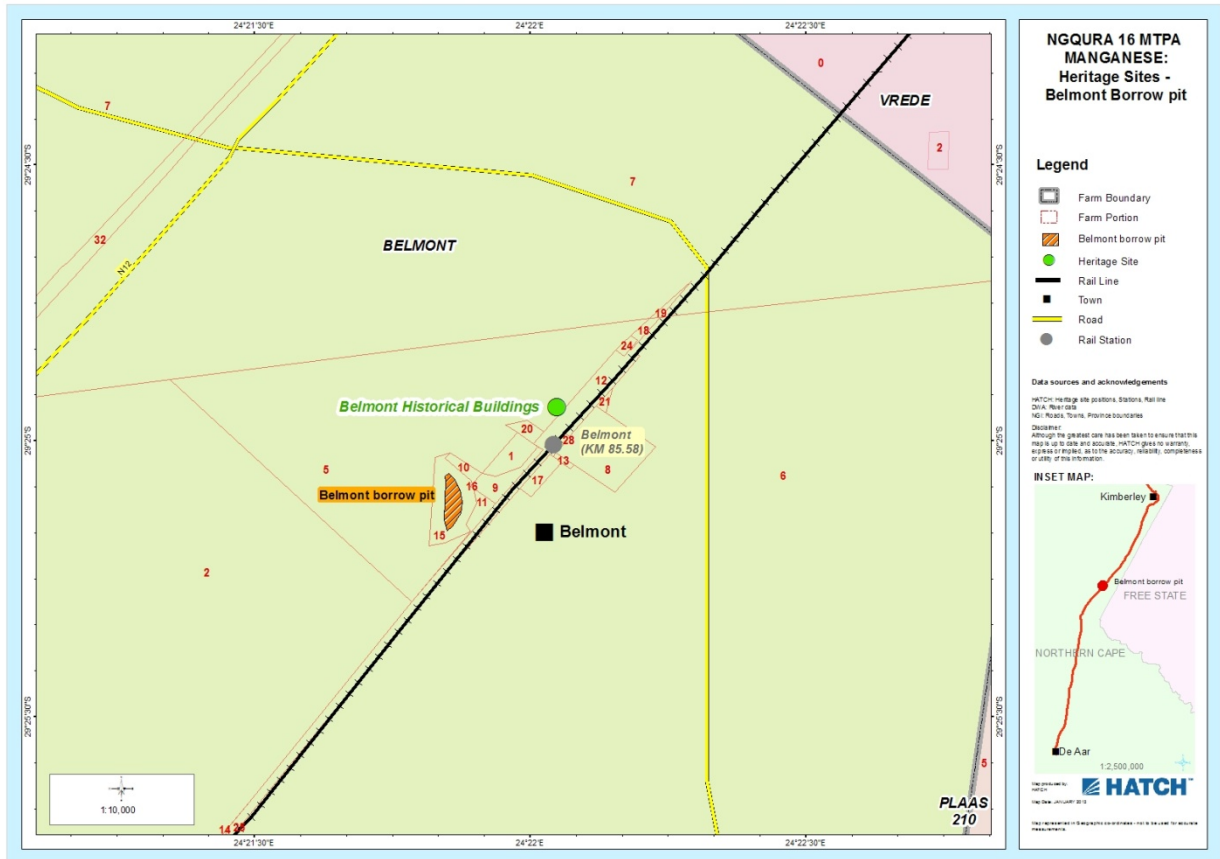


Figure 13: Heritage Sites – Heuningneskloof Borrow Pit



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**Figure 14: Heritage Sites – Belmont Borrow Pit**