

# HERITAGE IMPACT ASSESSMENT WITH INTEGRATED SET OF RECOMMENDATIONS

## PROPOSED SAND MINE ON BLAAUWBERG FARM (CAPE FARM 88 AND CAPE FARM 91, MELKBOSSTRAND), CITY OF CAPE TOWN

By

PHS Consulting



March 2012

cell: 082 7408 046 | tel: (028) 312 1734 | fax: 086 508 3249 |  
[phsconsult@telkomsa.net](mailto:phsconsult@telkomsa.net) | 1 Myrtle ave, Hermanus | P.O Box 1752 | Hermanus 7200

## Table of Contents

1.	PROJECT DESCRIPTION	1
1.1.	Introduction	1
1.2	Description of Proposed Sand Mining Activity	2
1.3	Terms of Reference	5
1.4	Public Participation	5
2	SITE DESCRIPTION	6
2.1	Location	6
2.2	Description of the Area	7
2.2.1	MA1 and MA	2
2.2.2	MA3	8
2.2.3	MA4	8
2.2.4	MA5	8
2.2.5	Photo Report	9
2.2.6	Conservation Initiative	3
3.	HERITAGE RELATED STUDIES	14
3.1	Archaeological Background and Context	14
3.2	Palaeontological Background and Context	15
3.3	Historical Background and Context	15
3.3.1	Battle of Blaauwberg	15
3.3.2	Historic homesteads	18
3.4	Visual Background and Context	20
4.	HERITAGE RESOURCES	23
4.1	Archaeology	24
4.2	Palaeontological	24
4.3	Historic	24
4.3.1	Battle of Blaauwberg	24
4.3.2	Historic Homestead	24
4.4	Visual	25
5.	BASELINE INTEGRATED SET OF RECONDITIONS	26
5.1	Layout	26
5.2	Roads & Infrastructure	26
6.	RESPONSES TO THE HERITAGE RECOMMENDATIONS	27
7.	REVISED AND PREFERRED ALTERNATIVE	29
8.	HERITAGE IMPACT ASSESSMENT	30
8.1	Archaeological Impact Assessment	30
8.2	Palaeontological Impact Assessment	30
8.3	Historical Impact Assessment	30
8.4	Visual Impact Assessment	31
8.5	Cumulative Heritage Impact	32
9.	CONCLUSION AND INTEGRATED RECOMMENDATIONS	32

## List of Figures

Figure 1: Location	2
Figure 2: Original Alternative; Proposed Mining Areas (MA1-MA5).	3
Figure 3. Estimated mineral sand resource areas to be mined	4
Figure 4: Terrain map	7
Figure 5: Proposed Mining Areas MA1 to MA5 in relation to City of Cape Town's Biodiversity Network (map and legend provided by the City of Cape Town)	13
Figure 6: Battle of Blaauwberg, battle-lines	17
Figure 7: Oblique view of the site from the North West to the Southeast.	21
Figure 8: Viewsheds and view corridors	22
Figure 9: Heritage resources and constraints	23
Figure 10; 2 <sup>nd</sup> and Revised Alternative indicated in transparent red (MA 1 will be known as RA1 & MA 2 will be known as RA2)	27
Figure 11; 2 <sup>nd</sup> and Revised Alternative: MA4 will be known as RA4, a section in the south was removed due to botanical constraints	27
Figure 12: Revised and Preferred Alternative	28

## List of Tables

Table 1. Comments received relating to potential visual, cultural landscape and heritage impacts	5
Table 2: Relevant landscapes	20
Table 3: Visual constraints	25
Table 4: AIA	29
Table 5: Historic Impacts	30
Table 6: Original Alternative Visual Impact Ratings	30
Table 7: Revised Alternative Visual Impact Ratings	31

## List of Annexure

Annexure A: Archaeological - Jonathan Kaplan, Agency for Cultural Resource Management	
Annexure B: Palaeontological - John Pether, Geological and Paleontological Consultant	
Annexure C: Historical - Gustav Hendrich	
Annexure D: Visual – PHS Consulting	

## **1. PROJECT DESCRIPTION**

### **1.1. Introduction**

Amathemba Environmental Management Consulting on behalf of Tip Trans Resources (Pty) Ltd has submitted an application to the Department of Mineral Resources (DMR) for a sand mining right in terms of Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA). It is required to submit a scoping report and an Environmental Management Programme (EMP) to the DMR in a format specified by the DMR.

An application form for environmental authorisation for the proposed sand mine was accepted by DEA&DP on 13 October 2011. DEA&DP Reference: E12/2/4/2-A2/305-3031/11 was assigned to the application.

Due to the requirements of the National Heritage Resources Act (Act 25 of 1999) a Notice of Intent to Develop (NID) was submitted by Amathemba Environmental Management Consulting in 2011. Heritage Western Cape (HWC) provided comment on the 16<sup>th</sup> of November 2011 requesting a Heritage Impact Assessment (HIA) with a set of integrated recommendations incorporating studies that relate to the following studies:

- Archaeological
- Paleontological
- Historical
- Visual

Amathemba Environmental Management Consulting subsequently requested a review on the interim comments that related to the paleontological and historical environment. HWC denied the request on the 6<sup>th</sup> of December 2011 based on following reasons:

1. Although the Witzand Formation has yielded a sparse fossil record, the underlying Springfontyn Formation has yielded significant palaeontological material in other parts of the Western Cape. As such, a desktop palaeontological study is required to ascertain the fossil potential of the Springfontein Formation at this site and to alert the developer as to potential sensitivities. The purpose of the study is to provide recommendations and a mitigation strategy if required;
2. An historical study is required due to the historical sensitivity of the location. The NID mentions that 200 burials, related to the Battle of Blouberg, are thought to be located in the area. The historical study must investigate the validity of this statement and the potential effects of the mining activities on any historical material. This study must be done by a person appropriately qualified in this field.

#### **(HWC comment dated 6 Dec 2011)**

PHS Consulting was appointed to conduct the HIA and the compilation of the integrated set of recommendations. The following specialist appointments were made:

- Archaeological - Jonathan Kaplan, Agency for Cultural Resource Management
- Palaeontological - John Pether, Geological and Paleontological Consultant
- Historical - Gustav Hendrich,
- Visual – Paul Slabbert, PHS Consulting

## 1.2 Description of Proposed Sand Mining Activity

The application is for a proposed sand mining project. Sand is a basic material that is needed for construction and development projects. Five areas on the farm have been identified as containing significant sand resources. The total area that has been applied for is 336 hectares in 5 separate proposed mining areas. All of the proposed mining areas have been previously transformed, ploughed and used as pastureland for cattle.

A structured method of mining and concurrent rehabilitation is planned for these properties. Each mining area will be divided into blocks of approximately 1 hectare in size. Before mining of the first block starts, the top 300mm of topsoil will be removed. The topsoil will be stockpiled just outside of the first block. Rehabilitation will start immediately when mining has been completed on the first mining block. The area will be levelled and sloped and the topsoil will be replaced. The rehabilitated area will be ploughed and a cover crop established to stabilise the soil and protect it from erosion.

**At any one time there should be approximately one hectare of land open in the active mining area, and one hectare of land that is being rehabilitated (i.e. concurrent mining and rehabilitation). When mining has been completed in one of the Mining Areas, it will be necessary to complete the rehabilitation of the final mining block, before moving on to the next Mining Area.**

The planned end use of the land is to rehabilitate it so that it can continue being used as pastureland for cattle (i.e. extensive agriculture).

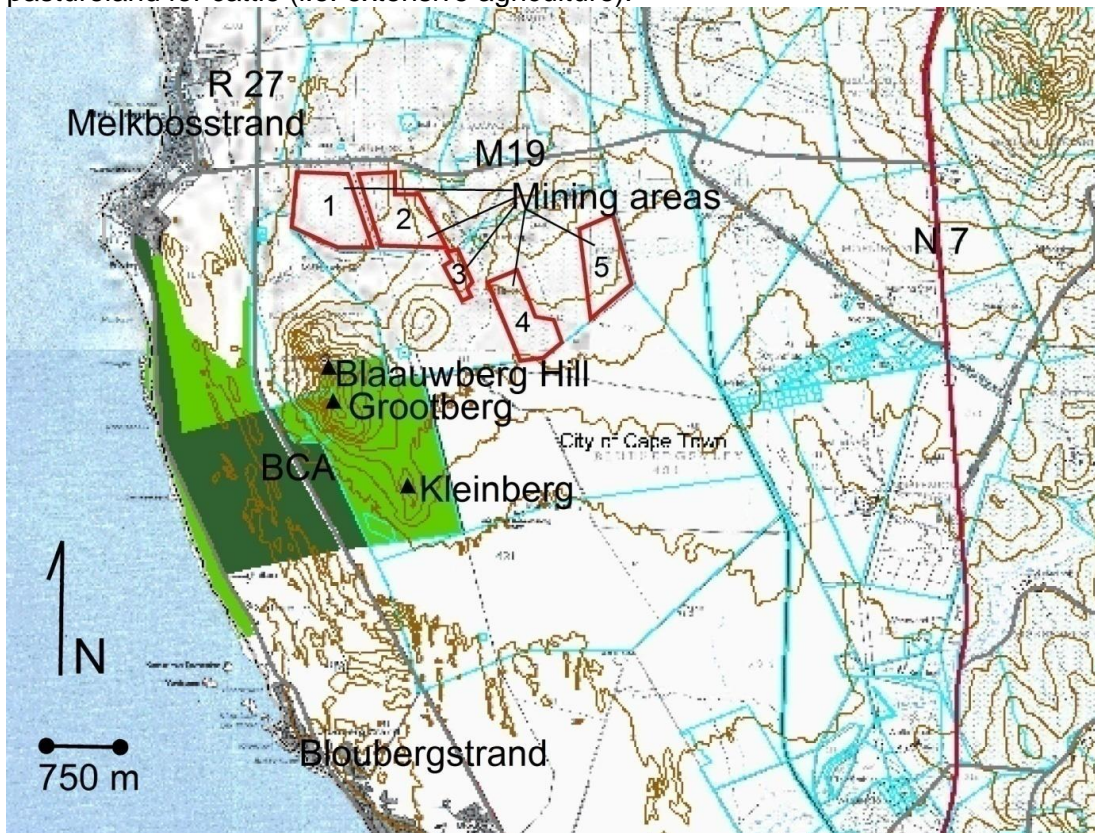


Figure 1: Location

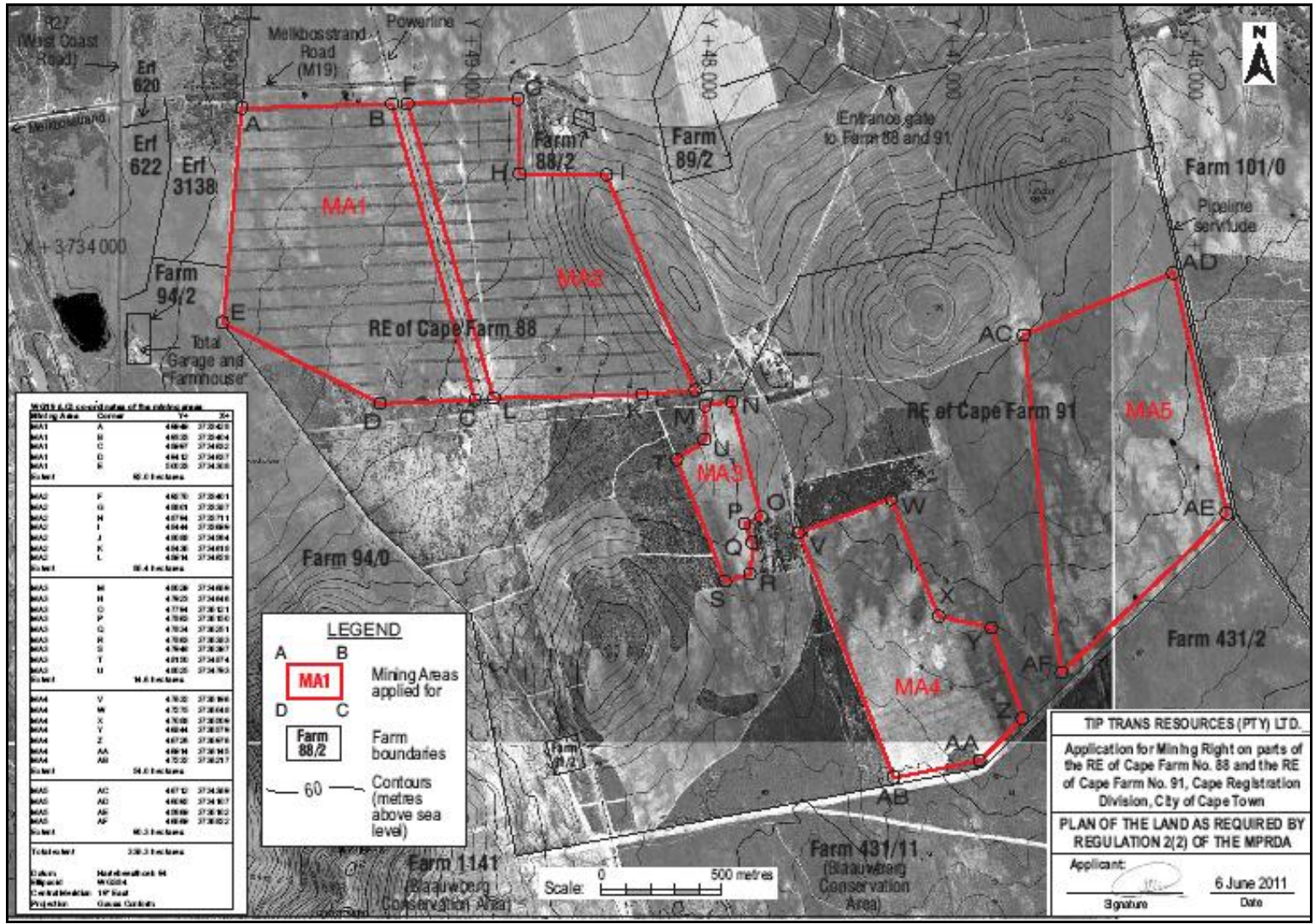


Figure 2: Original Alternative; Proposed Mining Areas (MA1-MA5).

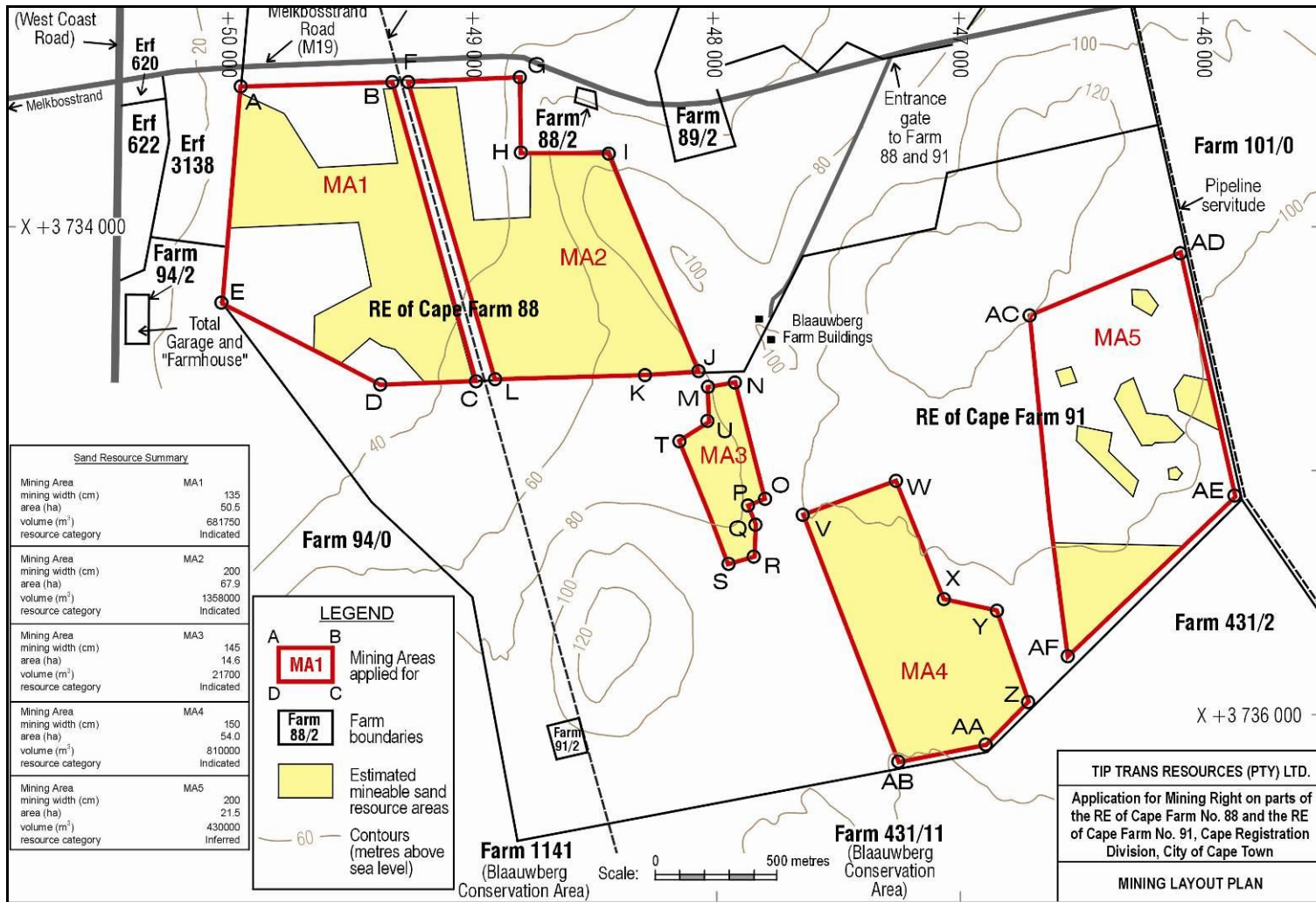


Figure 3. Estimated mineral sand resource areas to be mined

### 1.3 Terms of Reference

A HIA of proposed development was requested by Heritage Western Cape as part of the EIA phase of the mining application. The purpose of the HIA is to determine the Heritage Impact that the proposed mining activities on the heritage resources present on site and in the area.

The HIA is a statement of significance regarding the heritage of a development area. S38 (3) of the NHRA 1999, details the basic requirements of an HIA:

S 38(3) the responsible heritage resources authority must specify the information to be provided in a report (in this case HWC comments; 16 Nov and 6 Dec 2011) required in terms of subsection (2)(a): provided that the following must be included:

- (a) the identification and mapping of all heritage resources in the area affected;
- (b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
- (c) an assessment of the impact of the development on such heritage resources;
- (d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

The body of the HIA report is to include the above, a summary of specialist findings and particular attention given to an integrated set of recommendations. These recommendations are to take into account the specialist recommendations and to provide HWC with a holistic approach to the interpretation of the heritage of the development.

### 1.4 Public Participation

Issues raised during the public participation process as part of the EIA process, have been provided by AMATHEMBA Environmental Management Consulting CC. Only those issues that have visual, landscape and heritage implications are listed below:

**Table 1.** Comments received relating to potential visual, cultural landscape and heritage impacts

Comments and responses		
HWC	An Interim Comment dated 14 November 2011 was provided by HWC requiring an HIA incorporating the following studies with an integrated set of recommendations: 1. archaeological; 2. palaeontological; 3. historical; and 4. visual.	28 November 2011, AMATHEMBA Environmental Management Consulting CC wrote to HWC requesting that HWC should review the interim comment and exclude the requirement for the historical and paleontological studies
	HWC subsequently replied on the 6 <sup>th</sup> of December, confirming	



	<p>the need for an paleontological assessment an the historic assessment, referring in specific to the Battle of Blaauwberg.</p>	
<p>City of Cape Town</p>	<p>The location of the Battle of Blaauwberg burial sites is unknown. Appropriate heritage investigations must be undertaken.</p> <p>Given the projected 20 years life cycle normally associated with a vast mining area of this nature, the mining blocks should be completed in a sequence that would minimize potential impact on the northwards expansion of the Blaauwberg growth corridor.</p> <p>In addition areas least visible from the M19 Melkbosstrand road should be mined first. In this regard, the opinion is held that mine phasing should commence first with MA5 and end with MA1.</p> <p>Conservation Initiative, for further comments that relate to the inclusion of some of the application area into the Blouberg Conservation Area</p>	<p>Historic Study determined that it is “highly unlikely that a considerable number of burials occurred within the areas of Blaauwberg Farm”.</p> <p>The mining activity is not complex and, if required, the sequence can be changed.</p> <p>The comments related to the Biodiversity Network were field checked by a botanical specialist.</p> <p>The sites landscape significance relate to the natural environment and areas critical for conservation. Areas suitable for maintaining and furthering conservation efforts should be excluded from the mining area.</p>

## 2 SITE DESCRIPTION

### 2.1 Location

The proposed mining areas are located on the farm Blaauwberg in specific the remainder of Cape Farm 88 and the Remainder of the Farm 91. The farm is to the east of the R27 (West Coast Road) and to the south of the M19 (Melkbosstrand Road). Access to the farm and the proposed mining sites is off the M19 at the current farm entrance.

Five mining areas have been set aside for the application namely MA1, MA2, MA3, MA4 and MA5. The closest mining area to an urban area, MA 1 is 1, 5 km east of Melkbosstrand and 1 km east of Atlantic Beach Golf Estate. The Blaauwberg Hill and Blouberg Conservation Area (BCA) is approximately 1 km south and southwest of the applied area. Bloubergstrand is 5 km south of the proposed mining area.

## 2.2 Description of the Area

The study area is typical of the West Coast region, consisting of an undulating landscape consisting of low hills and sandy flats. The soils consist of sands of Aeolian and marine origin overlying clay. Minimum soil genesis has taken place in the extremely sandy parent material. There is slightly darker topsoil A horizon, containing higher organic matter, which is 20 to 40cm deep. Most of the deeper sands are classified as the Fernwood soil form and the shallower soils are classified as the Kroonstad form according to the South African soil classification scheme. The soils are limited by the low clay content (+- 2-4%) and leaching of the upper soil horizons and therefore have a low water and nutrient holding capacity. As a result, they have a low agriculture potential.

Blaauwberg hill and Kleinberg hill south of the application area are significant features in the landscape. The main ridgelines of the hills trend in an N-S direction, parallel to the coastline. Hills in the application area form a connection to the west and northwest with Blaauwberg hill. The hill ridges form a strong “high-land” connection in the relative flat landscape. These ridgelines are indicated in a green broken line in Figure 2 below.

The area is characterised by 4 major landscape types, namely the Coastal terrace (A), undulating plains (D), hillock slopes (C) and the hill tops (D).



Figure 4: Terrain map

### **2.2.1 MA1 and MA2**

Totalling nearly 175 ha, MA1 and MA2 are located in the northwestern portion of the Remainder of Cape Farm 88, alongside M19. The large landholdings were previously ploughed and ripped to a depth of about 50 cm (Mr Seymour Currie pers. comm.), with numerous windbreaks planted in between. The windbreaks have since been removed and the landholdings are currently used for grazing, where several camps on the upper slopes have also been established. The bulk of the lands are covered in thick Kweek grass and are also becoming densely infested with alien Port Jackson, especially across the northern portion. The lands are flat, but slope from east to west toward the West Coast Road (R27). A large area alongside M19 has very recently been cleared of Port Jackson. An, Eskom servitude bisects MA1 and M2 more or less in the middle, alongside a sandy farm track. There is a small drinking pan near the southern boundary of MA1 and a large sand dune occurs in the northeastern portion of MA2. Surrounding land use is grazing and vacant land.

### **2.2.2 MA3**

At 14.6 ha, MA3 is located about 200 m southwest of the farm werf. The proposed site is covered in very thick Kweek grass. It is currently being grazed by cattle and is quite heavily trampled. There is hardly any surface stone on the subject property. Some remnant dunes and natural veld occurs in the southeast. There are no significant landscape features on the property, and the surrounding land use is grazing and vacant land. Blaauwberg Hill is situated a few hundred metres to the west of the site.

### **2.2.3 MA4**

MA4 is 54 ha in extent and slopes from north to south. The southern boundary of the proposed site is bordered by the Blaauwberg Conservation Area which is heavily infested with Port Jackson. Table Mountain and Durbanville Hills can be seen in the distance. The receiving environment is covered in a thick mat of Kweek grass. Dune mole rat activity is extensive over the property. There is hardly any surface stone on the proposed site. Some ostrich currently graze in the fields. There are some remnant dunes alongside the northern boundary of the proposed site, not far from where a small scatter of silcrete flake tools was found during a survey undertaken in 2002 (Kaplan 2002a). There is a large sand blowout in more or less in the centre of the site. Surrounding land use is grazing and vacant land.

### **2.2.4 MA5**

Measuring 90.3 ha in extent MA5 is fairly undulating and characterised by a line of large heuweltjies located alongside the western portion of the site. Some Restio grasses inhabit the heuweltjies. The remainder of the proposed site is covered in a thick matt of Kweek grass and dry weeds. The Blaauwberg Conservation Area borders the property in the south. Dune mole rat activity is extensive and the site is quite heavily trampled in places. There is a Telkom servitude running through the property in the north. There is very little surface stone on the proposed site. A pile of building rubble, concrete, bricks and large pieces of Koffieklip were noted, in the north east of the site, but it is unclear whether the rubble has been dumped on the site, or is the remains of a once-standing structure. Three small pans were also logged. Surrounding land use is grazing and vacant land.

**2.2.5 Photo Report**  
**MA 1 & MA 2**

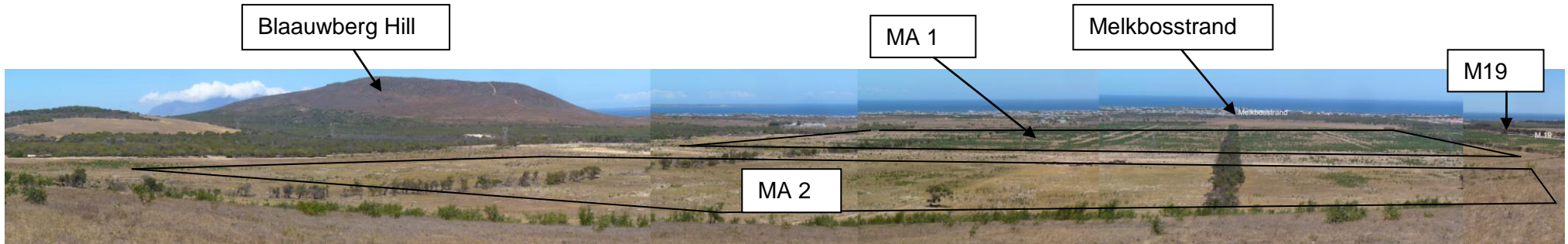


Photo 1: Taken from the viewshed towards the west, separating the application area in a distinct western and eastern area. MA 1 & MA 2 is located on the western side of the viewshed, closest to Melkbosstrand of the proposed mining areas.



Photo 2: Most north western corner of MA 1, with Blaauwberg Hill in picture



Photo 3: MA 1, viewed from the M19



Photo 4: taken from the M19, not mature blue gum lane and flat Nature of MA2



Photo 5: MA 2 with viewshed in background, note photo 1 was taken from this viewshed

**MA 3**



Photo 6: Taken with a view towards the south.

**MA 4**



Photo 7: Taken from the primary viewshed towards the east



Photo 8: On site status of MA 4

**MA 5**

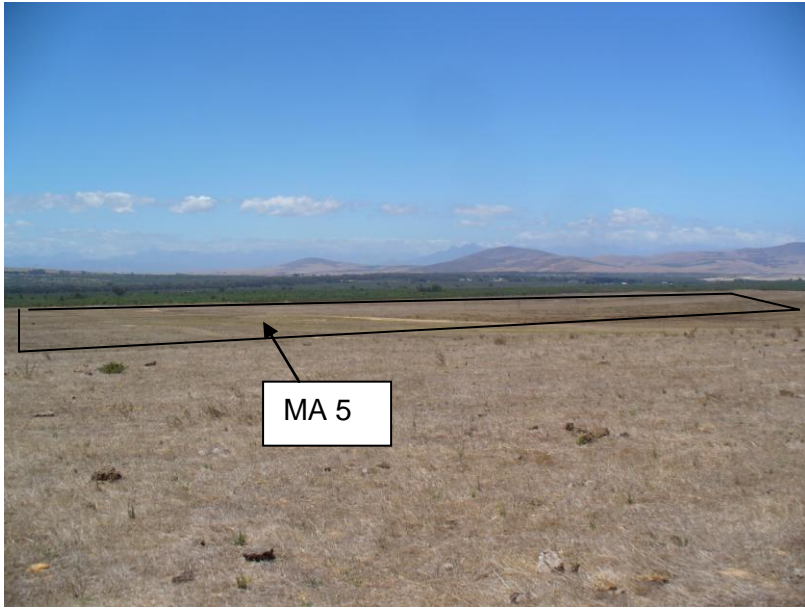


Photo 9: MA 5 with views towards the east

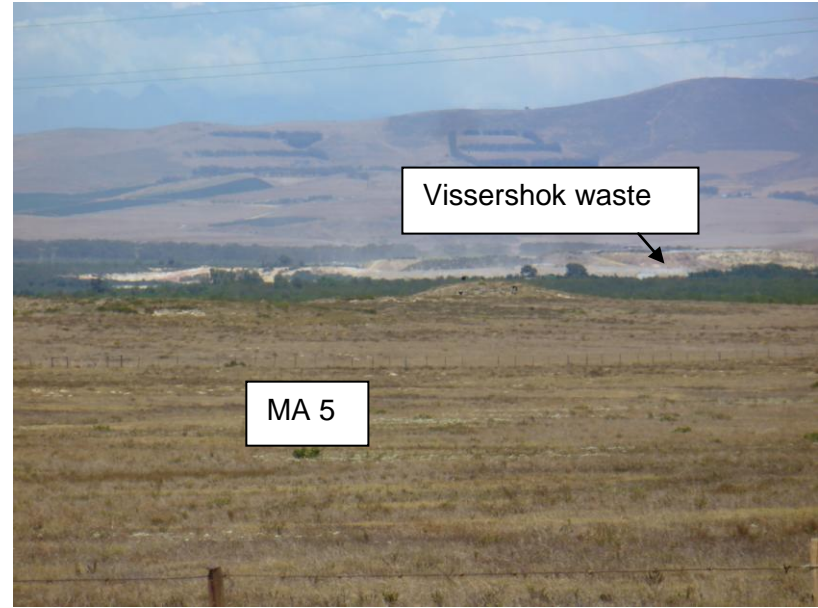
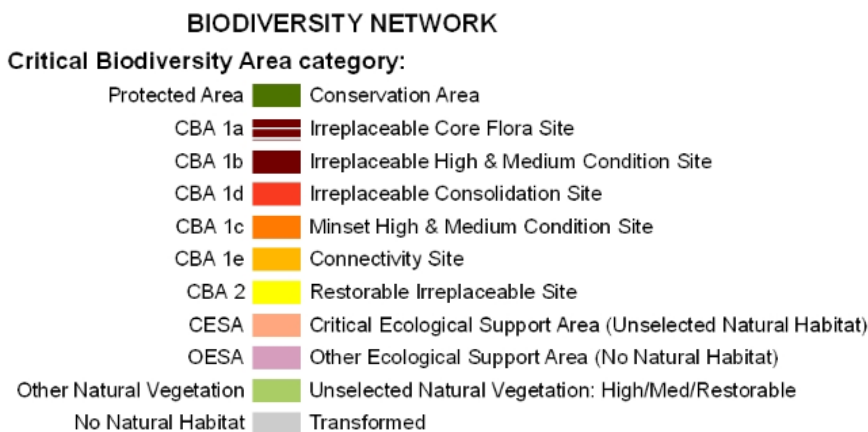
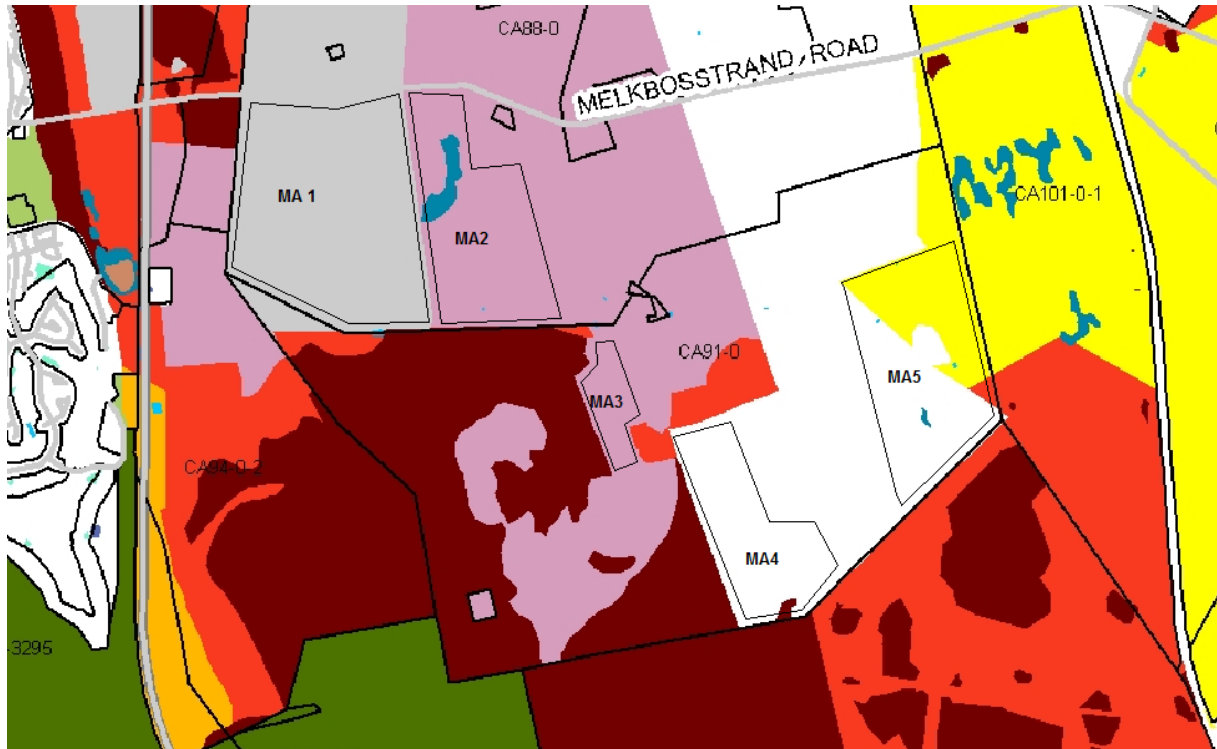


Photo 10: Views towards the south east from MA 5, with Vissershok in the background

## 2.2.6 Conservation Initiative

The Blouberg Conservation Area (BCA in Figure 1 above) is located to the south of the application area. Interim negotiations took place between the City of Cape Town and the landowner with respect to the acquisition of certain land in the application area for the BCA. The land portions required relate the City of Cape Town's Biodiversity Network plans. The City commented as per table 1 above, and provided a map showing proposed mining areas MA1 to MA5 in relation to the City's Biodiversity Network.



**Figure 5: Proposed Mining Areas MA1 to MA5 in relation to City of Cape Town's Biodiversity Network (map and legend provided by the City of Cape Town)**

The City of Cape Town's comments relate to the above map as follow:

Mining Area MA2 to MA5 impact on the City of Cape Town: Biodiversity Network in the following manner:

- MA2 - The possible presence of a wetland entity.



- MA3 - Located between a CBA 1b and a CBA 1d Irreplaceable site that forms part of land that the City of Cape Town has been attempting to acquire for inclusion to the Blouberg Conservation Area (BCA). As such the opinion is held that mining of MA3 and its potential detrimental associated edge effect of the CBA sites warrant this area to be excluded from mining activity.
- MA4 - The southern section affects a CBA 1b remnant.
- MA5 - The northeastern half of MA5 impacts a CBA 1d and CBA 2 remnant.

### 3. HERITAGE RELATED STUDIES

With reference to HWC comment dated 16 November 2011 the following specialist studies were commissioned:

- Archaeological - Jonathan Kaplan, Agency for Cultural Resource Management (Annexure A)
- Palaeontological - John Pether, Geological and Paleontological Consultant (Annexure B)
- Historical - Gustav Hendrich,(Annexure C)
- Visual – Paul Slabbert, PHS Consulting (Annexure D)

#### 3.1 Archaeological Background and Context

The archaeologist and others have undertaken numerous surveys in the Blouberg area. Even while the region has been heavily impacted by agriculture, archaeological heritage is still visible in these transformed landscapes. Scatters of Later Stone Age (LSA) implements have been recorded by J. Kaplan and by Jayson Orton of the Archaeology Contracts Office on Blaauwberg Farm, and two Khoisan burials were exposed in informal diggings (for building sand) on Oliphantskop Farm adjacent Blaauwberg Farm in the 1960s. Given the known archaeological sensitivity of the region, it was therefore assumed that pre-colonial archaeological sites (and human remains) might potentially be impacted by proposed sand mining operations on Blaauwberg Farm. While it is considered unlikely, 'war graves' relating to the Battle of Blouberg (1806) may also occur in the mining application area.

A two-day foot survey of Mining Areas (MA1-MA5) was undertaken, in which the following observations were made:

**MA1:** A relatively large scatter of LSA flakes and tools were documented in a large blowout between the Eskom servitude and a sand track in the southeastern corner of MA1. Numbering about 80 tools, the lithics occur on a slightly gritty, yellow sand floor, about 1.5 m below the overburden. The majority of the tools are in fine-grained silcrete, but tools and debitage in quartz and shale were also noted. Many flakes, including a few bladelets were counted, as well as utilized and retouched pieces, round and cylindrical cores, one convex scraper and a single high backed/boat shaped scraper. Several hammerstones, grinding stones, manuports, an anvil, and a broken bored stone fragment were also found. A few small pieces of red ochre were recovered. No pottery was found, suggesting that the site is older than 2000 years. Tortoise bone, and several large weathered limpets and fragments of a diagnostic limpet shell were noted providing a direct link with the ocean more than 3 kms to the west. While the site has been disturbed and the material displaced by natural processes, it is contained within the blowout, and is possibly a nearly complete sample of a range of tools and subsistence remains that are representative of the time.

The context in which the tools and remains were found means that the site (known as Site 475) has been rated as having medium-high (Grade 3B) local significance.

The site will not be directly impacted by proposed mining activities, as it is located outside the mining application area, but secondary (or indirect) impacts relating to sand mining operations (such as the use of heavy vehicles for example), may damage the site and compromise its integrity over time.

A few more silcrete and quartz flakes were found alongside/in the Eskom servitude and in the sandy farm road, but these are isolated finds, occurring in a disturbed context and have been rated as having low (Grade 3C) local significance.

**MA2:** Several isolated quartz chunks and flakes, and some modern glass and porcelain were found over the large footprint area of MA2, but the remains are not significant (Grade 3C).

**MA3:** No archaeological remains were found in MA3.

**MA4:** A silcrete adze, a quartz cores and several quartz chunks were found in a sand blow out in MA4. The very small numbers mean that the archaeological remains have been rated as having low (Grade 3C) local significance.

**MA5:** No archaeological remains were found in MA5.

The specialist archaeological study has shown that proposed sand mining operations on Remainder of Cape Farm 88 and Remainder of Cape Farm 91 will not have an impact of great significance on surface archaeological remains, but buried sites and unmarked (indigenous and war graves) human remains may however, be uncovered or exposed mining operations.

### **3.2 Palaeontological Background and Context**

The proposed mining areas are situated on the **Springfontyn Formation**. The Springfontyn Formation is an informal category that accommodates the mainly non-calcareous, windblown sand sheets and dunes that have covered parts of the landscape during the middle and late Quaternary. White sands of the Holocene Witzands Formation have encroached upon the area in the southeast (MA4 & MA5). The investigation of the thickness of sand in the mining areas by trial pitting (Lanz, 2011) shows that it is usually less than ~3 m, but this is exceeded locally by higher Witzand dune forms.

Some fossil bones of terrestrial mammals have been found in the Springfontyn Formation and lignified and “coalified” plants, tree stumps and logs have been found at several places and are the most common fossil remains encountered (Theron, 1984). Notwithstanding, the fossil potential of the Springfontyn Formation is low. Marine deposits such as residual basal gravels with abraded fossil bones and teeth may underlie the Springfontyn Formation. There is some possibility of encountering residual marine deposits below ~50 m asl. in areas MA1 and MA2. However, these are likely to be decalcified and altered.

### **3.3 Historical Background and Context**

#### **3.3.1 Battle of Blaauwberg**

The notorious Battle of Blaauwberg (today ‘Blouberg’) of January 1806 is regarded by historians and social scientists as a pivotal battle in the history of South Africa. Essentially it signified the end of Dutch colonial rule and the heralding of Southern Africa into the English sphere of influence. Apart from the preconceived notion that the battle was a colonial, albeit Eurocentric conflict between Britain and France (with the Netherlands and Batavian rule at the Cape being allies) during the Napoleonic Wars, some historians regarded it merely as a “minor skirmish”. Notwithstanding the seeming impression of the battle as a European

colonial battle, it is worth mentioning that the (Dutch) Batavian forces comprised many nationalities. French and German mercenaries as well as local indigenous peoples such as the Khoikhoi and even slaves. Globally, the battle was alleged to be one of the largest seaborne invasions Britain had ever undertaken.

It is understandable that there were differing perceptions of the battle, which in turn affected the attitudes towards heritage conservation. As a result of the British victory it is worth mentioning that the defeated Dutch, and their later descendents, the Afrikaners, perceived the battle as being part of a protracted struggle for independence. After the Afrikaner Nationalists' take-over of power in 1948 and the declaration of the Republic of South Africa in 1961 political ties with the British Empire were cut – this led indirectly to antipathy to past British influences. The fact that the Battle of Blaauwberg battleground has not been declared a national monument or even utilised for local tourism, exemplifies the indifference of the apartheid government towards the conservation of the area. Archival documents reveal that various allowances were made for purposeful development within the locality, whereas in most cases any reference to the battleground has been disregarded altogether.

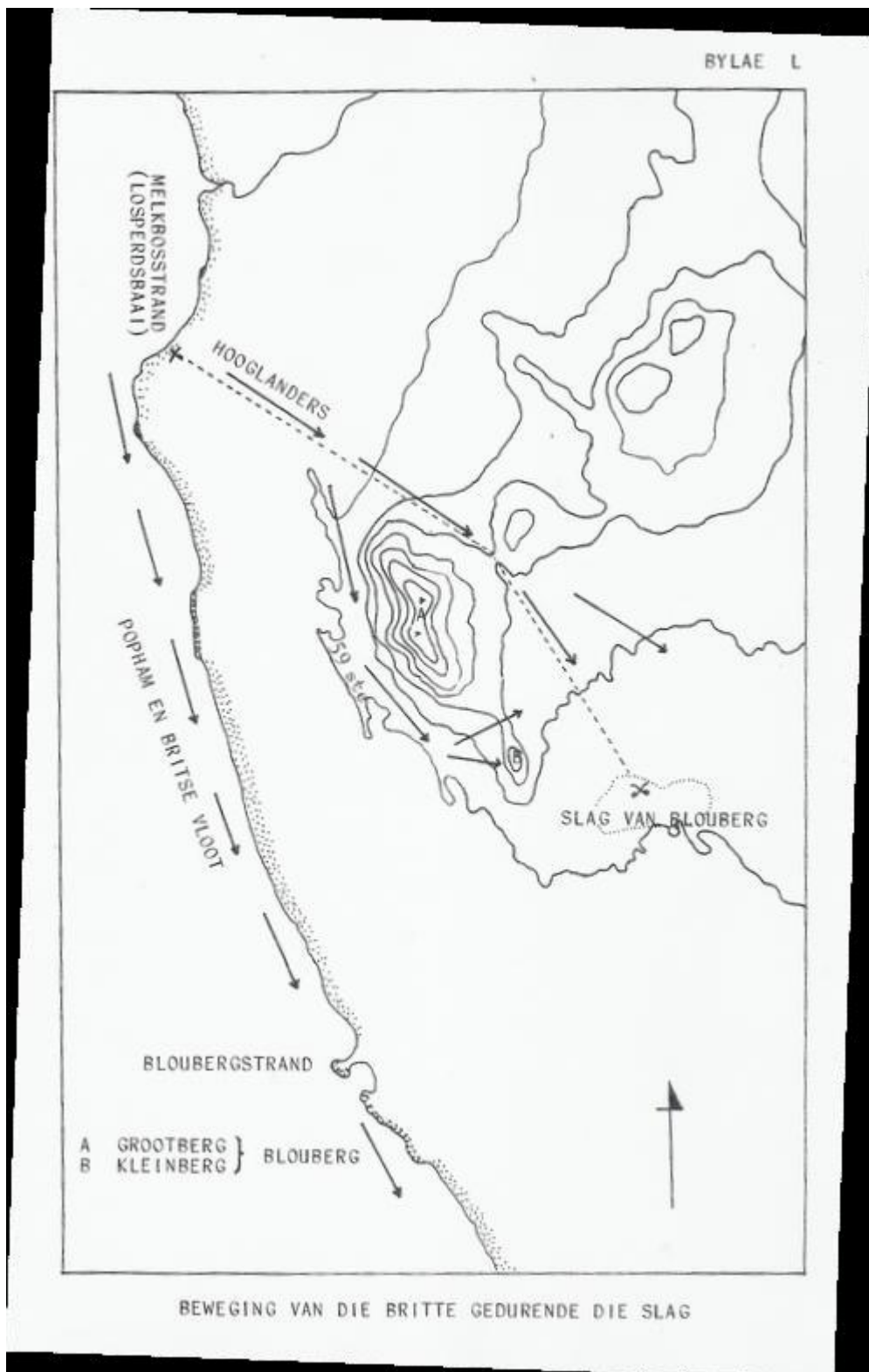
It is noteworthy that after 1994 adequate steps were taken to conserve and protect the locality of the Battle of Blaauwberg. As a result of the 200 year centenary of the battle in 2006 and its subsequent commemoration by means of re-enactment displays to the public, a new interest in the subject came to the fore. Not only were initiatives directed to advance the public awareness or consciousness of the heritage value, but also of the biodiversity potential of the area. An article in the *Cape Argus* of 23 May 2007 emphasised the importance of Blaauwberg Hills for conservation, and only a year after the centenary in 2007 it was proclaimed a conservation area.

In February 2010 it was reported that the company, Garden Cities, had transferred the historically important grounds to the Cape Town City Council to be added to the Blouberg Conservation Area (BCA). As a consequence, the area of land covering 462 ha (which includes Blaauwbergsvlei), has enlarged the BCA terrain by more than a third to 1415ha.7 Henceforth, the BCA became one of the most extensive conservation areas in the Cape Town metropolis.

The leading historian, George McCall Theal, provided a description of the course and aftermath of the battle. According to Theal the opposing British forces (under General David Baird) and the Dutch forces (under General Jan Willem Janssens) were strategically facing each other in a linear pattern, after the British had landed on Losperd's Bay (today Melkbosstrand). As the Dutch forces were outnumbered, Janssens ordered a retreat to a position at Kleinberg, supported by artillery. Theal's description of the positioning of the armies was as follows:

“The British soldiers were seen descending the shoulder of the Blueberg, marching in the cool of the morning towards Cape Town. General Baird had formed his army in two columns. That on the right, consisting of the twenty-fourth, fifty-ninth, and eighty-third regiments, was commanded by his brother, Lieutenant-Colonel Baird. The last column was the Highland brigade, under Brigadier-General Ferguson. Altogether there were about four thousand rank and file, besides the artillerymen and five or six hundred sailors armed with pikes and drawing two howitzers and six field-guns.

The Dutch general now extended his forces in a line covering the whole English front. By this time the armies were within cannon range, and the artillery on both sides was opening fire. A few balls fell on the ground occupied by the Waldeck battalion [Dutch unit], and that regiment began to retreat. The burghers, the French corps, the remainder of the troops, and the coloured auxiliaries were behaving well, receiving and answering a heavy fire with artillery and hunting rifles. But the fight on the main body of regular troops made it impossible for the mixed force left on the field to stand the charge of the Highland brigade, and by order of General Janssens the remnant of the army fell back.”



**Figure 6: Battle of Blaauwberg, battle-lines**

The artillery engagements brought havoc upon the soldiers, causing the battlefield to be scattered with corpses amongst the sand dunes. It was also brought about by the close proximity of the fighting (which included bayonet-charges) and artillery, which were approximately 1800 paces apart. Historian Tim Couzens calculated that the front-line of the battle extended to about 1600 metres, with the mounted burghers and artillery being positioned on Kleinberg and its slopes to the west. The archival maps and pictographs

inserted below indicate the geographical terrain and the lines of battle of the opposing armies.

At this point, it is important to take note of the places where the losses/casualties occurred. It is apparent that most of the casualties took place on the southeast side of Kleinberg, or the place where the main battle was fought, although, because of the sporadic artillery and musket fire on both sides, there were undoubtedly casualties outside the battle area. The irregularity of the surface, deep sand and almost impenetrable brushwood, further added to the uncertainty of the numbers of victims/casualties, as some soldiers were reported missing. It was mentioned that some wounded soldiers succumbed to the blazing summer heat, and being unnoticed, were left in the dunes.

After Janssens' right flank had crumbled, the army fell into disarray. Janssens ordered a general retreat to the Hottentots Holland Mountains from where he hoped to continue the resistance. This allowed the British forces to advance rapidly to Cape Town and demand the capitulation of the Dutch (Batavian) forces. As a result of Janssens having to retreat, there was no time to bury or retrieve the corpses which had fallen in the now British domain.

Reverend Martyn provided an eyewitness account on the aftermath of the battle, elaborating on the burials: "Overcome with emotion, Martyn went and lay under the sparse shade of some nearby bushes. Recovering his composure, he slowly walked back over the soft sand to Losperd's Bay. Although the sun was dropping below the horizon and bathing the sea in its fiery glow, burial parties were still hard at work interring the bodies where they had fallen. While General Janssens was on his way to Roozeboom, General Baird established his headquarters at Riet Vlei farmhouse and ordered the Scottish Brigade, now rested, to pursue what remained of the enemy's army up the Tygerberg, some few miles to the east.

Over five hundred men of both sides lay dead or wounded around the battlefield in the rear, or in Keet's farmhouse. At last the night closed mercifully on those who had suffered and died." is still not entirely clear from the historical sources where the specific burial grounds were situated immediately after the battle. This led to a controversy, not only about the burials as such, but also the exact number of casualties/losses. Initially historians differed quite radically with regard to the exact death toll, as the losses for the Dutch side were believed by British historians to be between 500 and 700. This proved to be an exaggeration, as a later recorded estimate at Rietvlei was that the total number of deaths, wounded and missing amounted to 337. On the British side, the calculations were more accurate as indicated in Theal's *Records of the Cape Colony*. According to Theal one officer, Captain Andrew Foster, and 14 men were killed, 180 men wounded and eight (8) reported missing.

### **3.3.2 Historic homesteads**

Two historic homesteads are located in the proximity of the application area. The first is the Blaauwberg homestead located on the application area (Remainder of the Farm 91). The second homestead is located on the neighboring farm called Melkboschplaas (Remainder of the Farm 94). Please refer to figure 9 below for localities.

It is important to note that the proposed sand mining activity will not have any contact or operational activities tied to the farmyards or homesteads. No additions or alterations to these homesteads are proposed. Therefore, no direct impacts are possible only indirect impacts that will relate to these houses position in the cultural and visual landscape.

The Blaauwberg homestead now called Joyce's Dairy is located in close proximity to the proposed MA 3, but approximately 700 meters away from the other proposed mining areas. It is clear that the homestead is older than 60 years but due to years of additions, it is difficult to determine the exact age. A study completed by Jonathan Kaplan in 2008 for the Proposed Melkbosch Framework Plan: Archaeological Heritage Scoping Study, it was noted that "The homestead at Joyce's Dairy (Blaauwberg Farm), while older than 60 years, has already been heavily altered and added onto over the years".



**Photo 10: Blaauwberg homestead**



**Photo 11: Blaauwberg outbuildings**



**Photo 12: outbuildings and homestead**



**Photo 13: Werf cottage**

The earliest buildings on the werf originate approximately from the late 1800's, when most of the original Swartland and Westcoast farms were established. The werf is surrounded by agricultural activities and the majority of the farm is ploughed and used for cattle grazing. The werf's significance relate to the proximity of the site to the Blaauwberg hill and the fact that the yard is located along the viewshed. The homestead is located within the hill top alignment, connecting the Blaauwberg hill with the surrounding high lying areas. This homestead form part of the surrounding visual and cultural landscape.

Klein Melkboschplaas (1842) alongside the R27 (at the northern toe of the Grootberg) is one of the oldest historic farmsteads in Melkbosstrand/Blaauwberg and one of the earliest farms to be established outside Cape Town. Part of the main farmhouse was destroyed by fire several years ago, but the original elongated building is still intact. The farms outbuildings have unfortunately, been altered and are currently used as a tourist/visitor facility and for several small commercial enterprises (Kaplan 2008).



Klein Melkbosch Farm (Farm 94) was sold to IPHC Property Holdings (Pty) Ltd in 2010. This is a company belonging to the International Pentecostal Holiness Church (IPHC). The Reverend Frederick S Modise who passed away in 1998 founded the IPHC in 1962. He was succeeded by his son, 'The Comforter, His Grace' Reverend M G Modise. Today the Church has 360 branches throughout South Africa with an active membership of more than 2.9 million people. Farm 94 is occasionally used by the IHPC for religious gatherings and ceremonies, which are held in large marquees. The house and yard is used for various activities that relates to urban services.



**Photo 14: Melkboschplaas werf at the foot of Blaauwberg Hill**

Melkboschplaas farm has been subdivided and various commercial activities were established along the R 27 including a petrol filling station. The werf is approximately 800 meter west of MA 1 the closest proposed mining area to the neighbouring farm. The farms significance relate only to the homestead and the links with Blaauwberg hill and the fact that

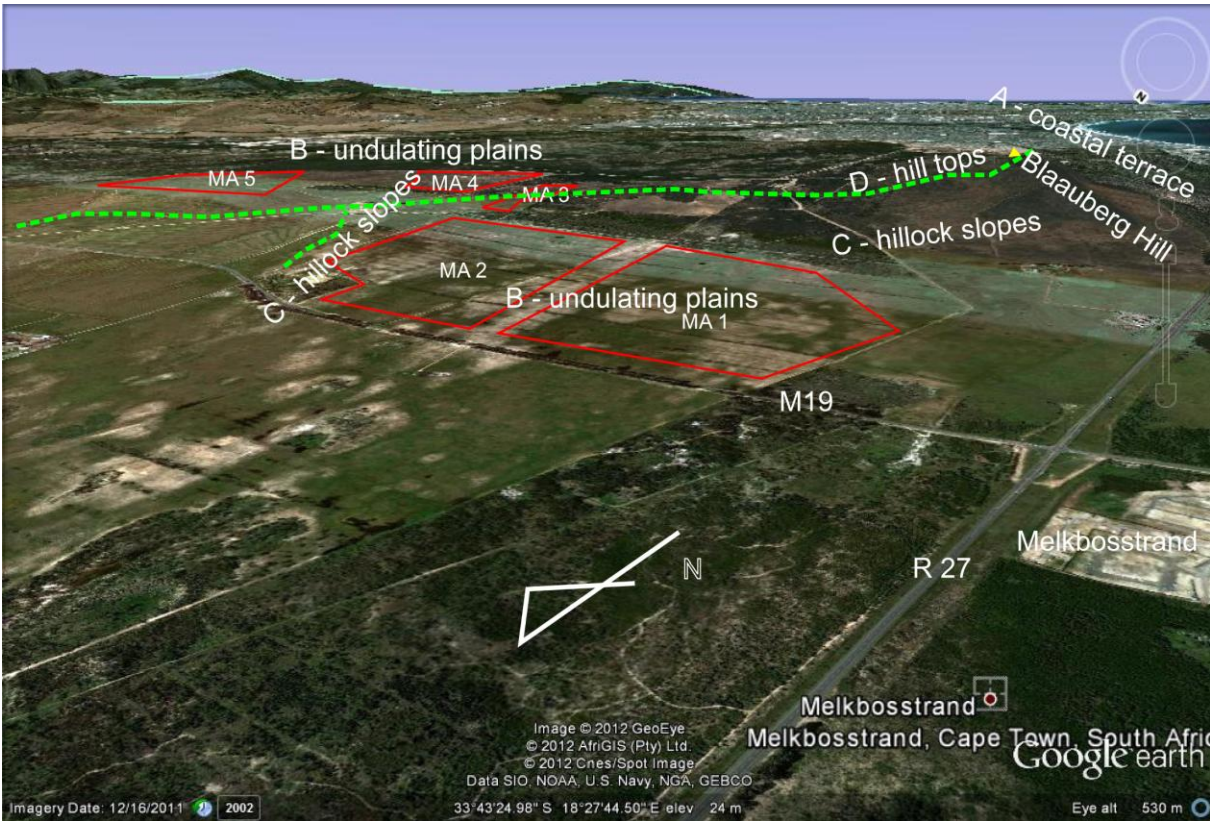
it falls within the alignment of the battle-lines of the Battle of Blaauwberg. This ties in with the landscape integrity of the greater area as pointed out in the visual impact assessment.

### 3.4 Visual Background and Context

Pertinent aspects that relate to the visual environment were spatially analysed in Figure 4, 6 and 7 of this report, and in more detail in the attached VIA. Mining will primarily take place in the following two landscape types:

**Table 2: Relevant landscapes**

<p>B – Undulating plains</p>	<p>Flattish sandy plains that gradually rise and fall. Some areas previously cultivated are very flat and sandy. These plains resemble what seem to be remnant dune formations. Flat areas are less visible than elevated areas. Sloped areas are generally visually sensitive.</p>	<p>Most of the mining development is proposed in this landscape type. All areas selected for mining were previously cultivated.</p>
<p>C – Hillock slopes</p>	<p>Moderately steep-sided hillsides covered in indigenous and alien vegetation, some slopes have been cultivated in the past, this zone is high visibility with scenic value.</p>	<p>Some of the mining areas encroach onto these slopes. In specific MA 2 is partly on a side slope and MA3 border slope and natural vegetated areas.</p>



**Figure 7: Oblique view of the site from the North West to the Southeast.**

The significance rating for the area is based on its scenic value arising from the juxtaposition of the Blaauwberg Hill, the inter-leading hilltops and the connection with the ocean. The fact that it borders the Blouberg Conservation Area adds to this significance, as does its proximity to the R 27 and M19 scenic routes. These routes forms an integral part of the scenic route network for this area. What is important to grasp is the scenic qualities in specific the road



scenic envelope and the scenic corridors. The scenic corridor between Blaauwberg Hill and the ocean needs to be maintained, and the connection between the hilltops is essential. The roads scenic envelope relate to the immediate area 300 meters on both sides of the M19 and the R 27.

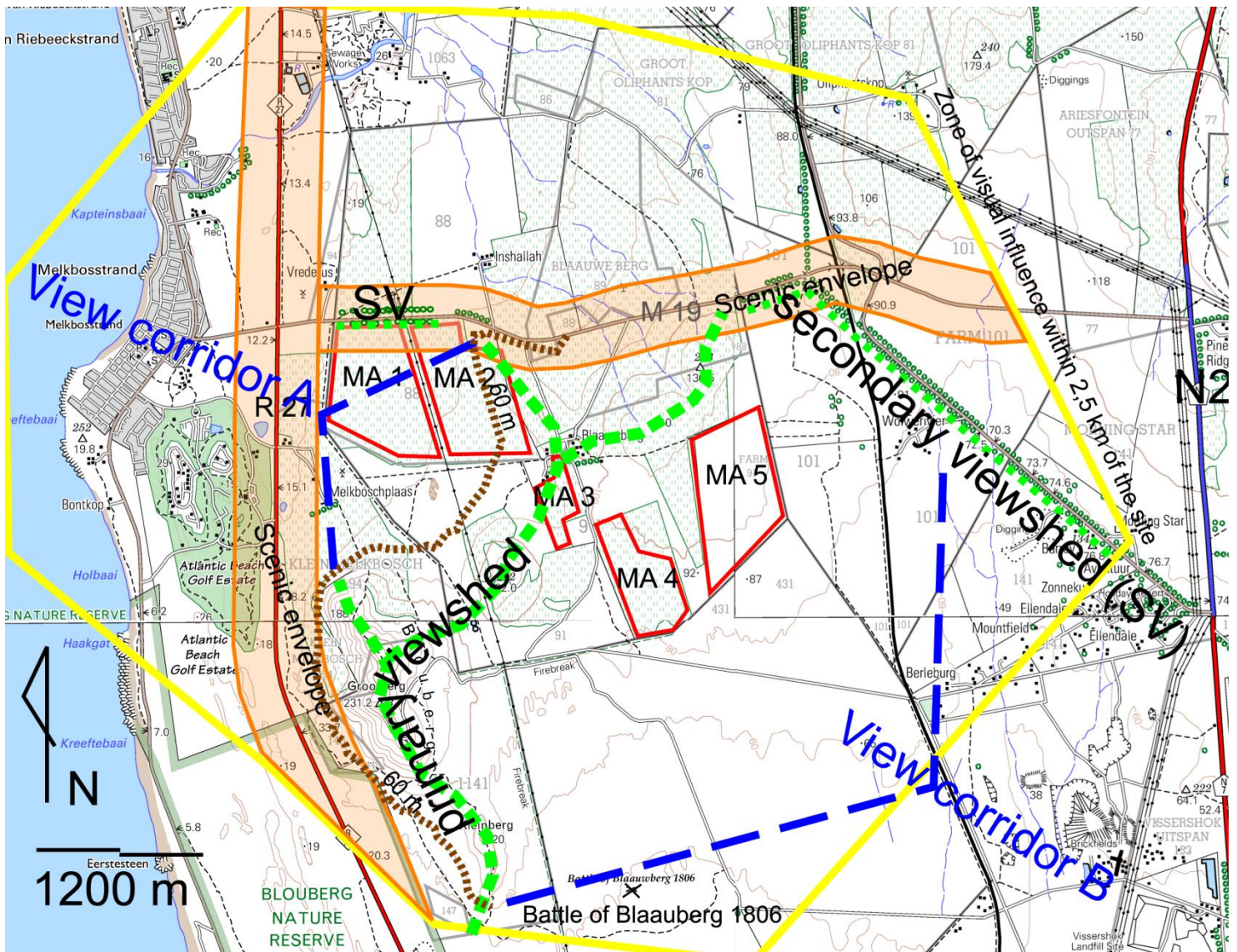
The conservation and agricultural area surrounding the site is furthermore one of the last remaining open spaces in close proximity to the Cape metropolis. The open spaces play an important role in giving the surrounding settlement its identity, especially where most of these are merging into almost continuous suburbia.

The open space / nature reserve plays an additional role in creating, not only a green conservation buffer and corridor between settlements, but also an important visual link between the urban and natural environment.

The proposed site was farmed and ploughed for many years and it is clear that the application areas are located on disturbed land. Many-built infrastructure exists on the farm and scars have been left by previous ploughed actions and access roads. Municipal bulk infrastructure in the form of overhead power lines servitudes, pipelines roads and reservoirs also contribute to the degraded nature of the area under investigation.

Due to the extent of the proposed site and the proximity of the primary viewshed, the site is divided into two distinct parts with a varying degree of significance. MA1 and MA2 are located on the ocean side of the viewshed, MA3 is located on the viewshed and MA4 and MA5 is located on the inland side of the viewshed.

Based on the landscape features and view corridors described above the MA1, MA2 and MA3 area can be regarded as having a "Moderate to High Landscape Significance" and a "High Landscape Significance" above the 60 meter contour line. The area on the inland side of the viewshed can be described as having a "Moderate Landscape Significance" throughout the area.



**Figure 8: Viewsheds and view corridors**

Only two view corridors exist that will provide views to potential receptors. View Corridor A is the most relevant due to the scenic routes and the cultural landscape views from this angle. View corridor B does not consist of many receptors and due to the distance between the application area and the remote receptors and the 1ha mining method, views of the proposed site activities are highly unlikely.

#### **4. HERITAGE RESOURCES**

With reference to the attached studies and the above summary of background and context find a combined map of the identified heritage resources present on site and in close proximity to the site. These heritage resources and constraints were presented to the environmental consultants and the applicant and mitigation suggestions were made in order to reduce the potential impacts that the original alternative will have on these resources.

The detailed resources are captured and described in this section.

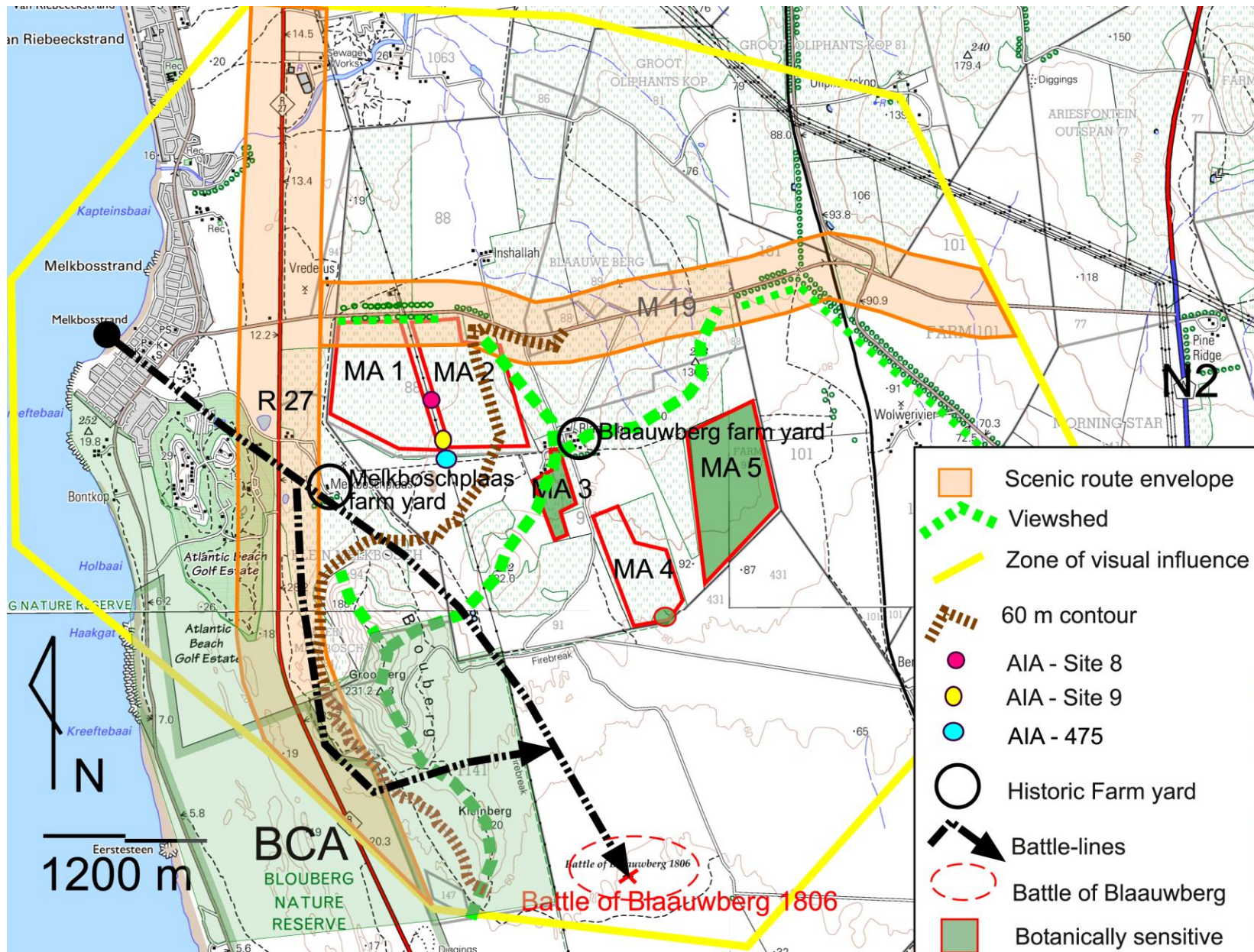


Figure 9: Heritage resources and constraints

## **4.1 Archaeology**

Jonathan Kaplan identified Site 475 in his attached AIA and rated the site as having medium-high (Grade 3B) local significance.

Site 475 will not be directly impacted by proposed mining activities as it is located between the Eskom servitude and a farm road (and therefore outside the mining application area), but secondary/indirect impacts relating to mining operations may impact negatively on the site. The site will however continue to be exposed, and erode back because of natural processes.

Site 475 appears to be very close, within just a few meters when plotted on Google Earth, to Site 9 documented by Orton (2010) during a survey for a proposed pipeline, described as having flaked artefacts in quartz and silcrete in a ploughed field (refer to Figure 20).

In addition, Site 8 documented by Orton (2010:25) consists of flaked artefacts in quartz and silcrete, a few pieces of ochre and shale and several marine shell fragments (refer to Figure 20). Orton (pers. comm.) has confirmed that his survey was restricted to the Eskom servitude; the proposed route for the sewer pipeline and that he did not venture outside the alignment.

Note that these sites primarily occur along the servitude line that does not form part of the proposed mining areas.

## **4.2 Palaeontological**

No resources were identified on site. In view of the low fossil potential, it is proposed that only a basic degree of mitigation is required. It is recommended that an alert for the uncovering of fossil bone and implements be included in the EMP for the mine.

## **4.3 Historic**

### **4.3.1 Battle of Blaauwberg**

The historical study found that there was much controversy and disagreement about the locations of the graves and the exact number of deaths. The death toll of approximately 200, as indicated by the archival sources, was much higher than initially anticipated or suggested by Heritage Western Cape. Besides the number of deaths, it is apparent that the majority of casualties took place within the demarcated Blaauwberg Conservation Area. In comparison to the BCA on the southeast of the topographical map, the strategic military/battle-lines on the historical maps do not overlap with the proposed sand mining area. According to the historical sources as analysed in this study, it is highly unlikely that a considerable number of burials occurred within the areas of Blaauwberg Farm where the proposed sand mining activities would take place. It is nevertheless not excluded that possible graves might have remained below the sand dunes or brushwood.

### **4.3.2 Historic Homestead**

The Blaauwberg homestead and historic buildings can be graded as Grade 3 C because it was significantly altered, the remaining fabric has historic value and it contributes to the broader spatial visual character of the area. The connection of this werf with the landscape and in specific Blaauwberg hill and its location on the viewshed, calls for the omission of MA 3, due to its close proximity and intrusion into the connected visual and cultural landscape.

The Melkboschplaas homestead can be regarded as a Grade 3 B because its historical fabric is mostly recognisable (past damage is reversible). Most elements of construction are authentic, fabric dates to the early origins of a place, fabric clearly illustrates an historical period in the evolution of a place, and fabric clearly illustrates the key uses and roles of a

place over time. The homestead is under direct threat to lose its significance due to uncontrolled urban related uses and additions. It needs to be noted that this homestead does not form part of the application area but due to its connection with the overall cultural landscape any interruption could further deteriorate its significance. The nature and extend of the application does not interfere or separate the homestead from the with the surrounding heritage resources or its connection with Blaauwberg hill or the surrounding hilltops.

**4.4 Visual**

The sensitive visual resources were identified, the constraints and no-go areas are pointed out in Table 3 below.

Type	Visual Constraints
Corridors	A 300m setback along the M19 and R 27, which is scenic route. The setback can be relaxed because the site is already disturbed and the fact that windrows and mature trees exist that can conceal the proposed works.
	A setback of at least 300 meter need to be provided, an existing windrow exist that can act as a berm for topsoil in the fist mining blocks
	MA3 is located along the axial that connect the hilltops and in line with the primary viewshed, this site is also within the identified Blouberg Conservation Area ecological support area.
Slopes	Avoid 1:4 slope encroachment, provide for a setback from theses slopes
	No mining above the 60-meter contour line in View corridor A on the coastal side of the viewshed.
Hills and ridgelines	As a norm these areas should be avoided
	MA3 is located along the ridgelines and axial connection of the hill tops
Natural areas	MA5 need to be omitted due to biodiversity reasons
	MA3 need to be omitted due to the connectivity and landscape restoration possibilities associated with the site

**Table 3: Visual constraints**

**5. BASELINE INTEGRATED SET OF RECONDITIONS (HERITAGE GUIDELINES)**

Heritage guidelines were proposed to inform the Original Alternative layout of the mining areas, in order to reduce the potential impacts on the identified heritage resources.

**5.1 Layout**

- Mining activities should ideally respect the R 19 scenic drive qualities to allow for continuation of the current open space and rural feel. A setback of 300-meter need to be provided from the M19. The mining areas are outside of the 300-meter zone of influence for the R 27.

- The closest existing windrow to the 300 meter should be selected in MA 1 and MA 2 to act as the most northern boundary of the mining area.
- Areas above the 60-meter contour in MA 2 should be avoided completely; this should act as the most eastern boundary of MA1.
- MA 3 should be omitted because it is located on the viewshed, proximity to the Blaauwberg Farm yard and along an ecological support area.
- MA 5 should also be omitted from the application based on botanical sensitivity.
- Setback of at least 20 to 30 meter from fence lines.
- Setback of at least 30 meters from the identified and recorded archaeological sites in the MA 1 & MA 2 proximity

## **5.2 Roads & Infrastructure**

- Only existing access roads should be used.
- Access roads should be kept as narrow as feasible, in order to minimize the development or expansion of new roads.
- Because mining of 1 ha and rehabilitation of 1 ha will run concurrent, limited to no infrastructure is required.

## **6. RESPONSES TO THE HERITAGE RECOMMENDATIONS**

Based on the above guidelines a “Revised Alternative” was produced and the following changes were made to the “Original Alternative”.

- MA 3 and MA 5 were omitted from the proposal, based on visual, cultural landscape, historical and ecological reasons.
- The remaining MA 1, MA 2 and MA4 were also amended and will be referred to as RA 1, RA 2 and RA 4 for the remainder of the assessment.
- The biggest changes in RA1 & RA2 are illustrated below. The preferred areas are shaded in transparent red; note the original MA points are also shown. The northern boundary of RA1 & RA2 is now setback by 340m south of the M19. This is more than the proposed guideline.
- MA 1 now called RA 1 is approximately 500 meter from the R 27, outside of the scenic envelope.
- The servitude allow for a wide enough buffer from the Orton’s identified sites.
- The southern boundary of RA1 has been moved well away due to the archaeological site identified by Jonathan Kaplan (Site 475) and Orton’s Site 9.
- RA2 has also been adjusted so that no part of RA 2 is above the 60m contour line. Only 2 corners touch the 60m contour line, & all the rest of the area is lower than 60m, respecting the visual and cultural landscape.
- Minor changes have been made to RA 4 for botanical reasons. A small patch has been excluded in the south & a 30m buffer has been left in the north.

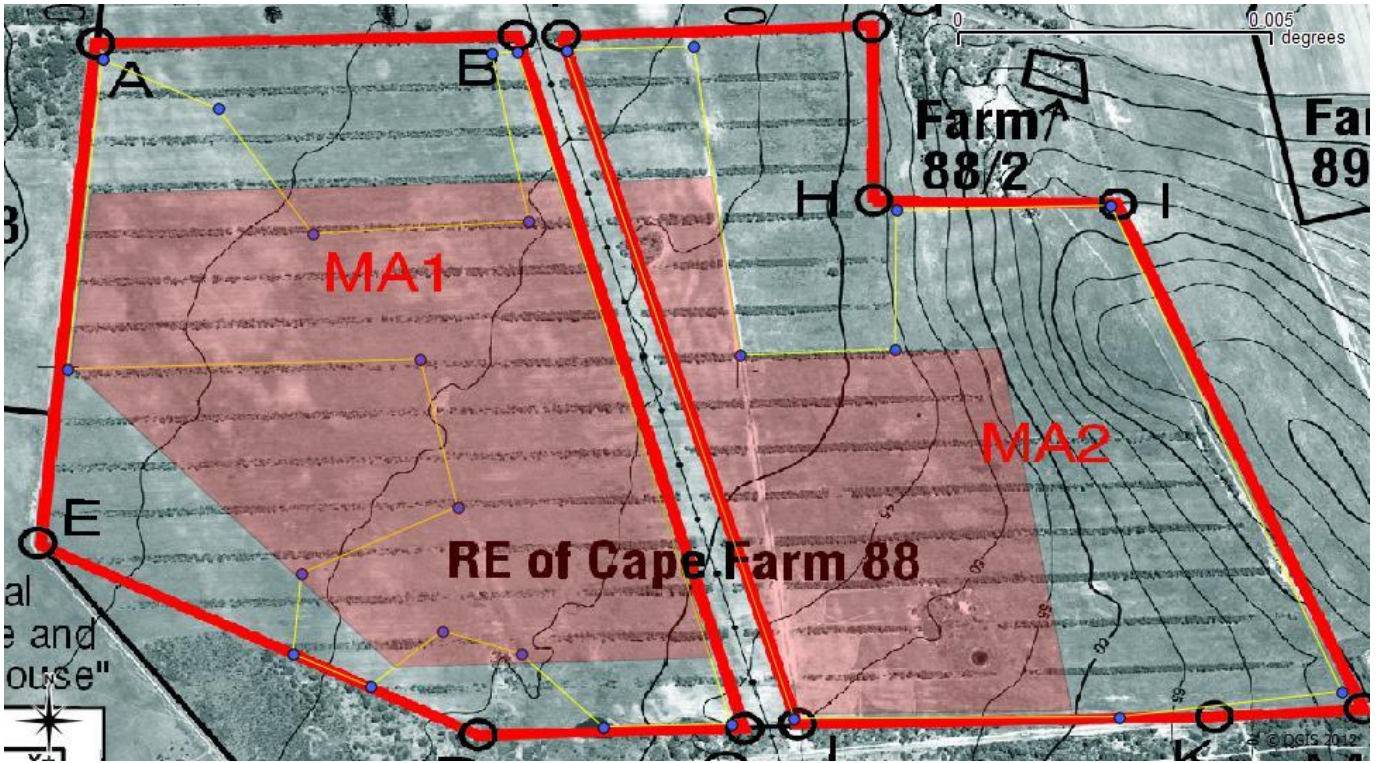


Figure 10; 2<sup>nd</sup> and Revised Alternative indicated in transparent red (MA 1 will be known as RA1 & MA 2 will be known as RA2)

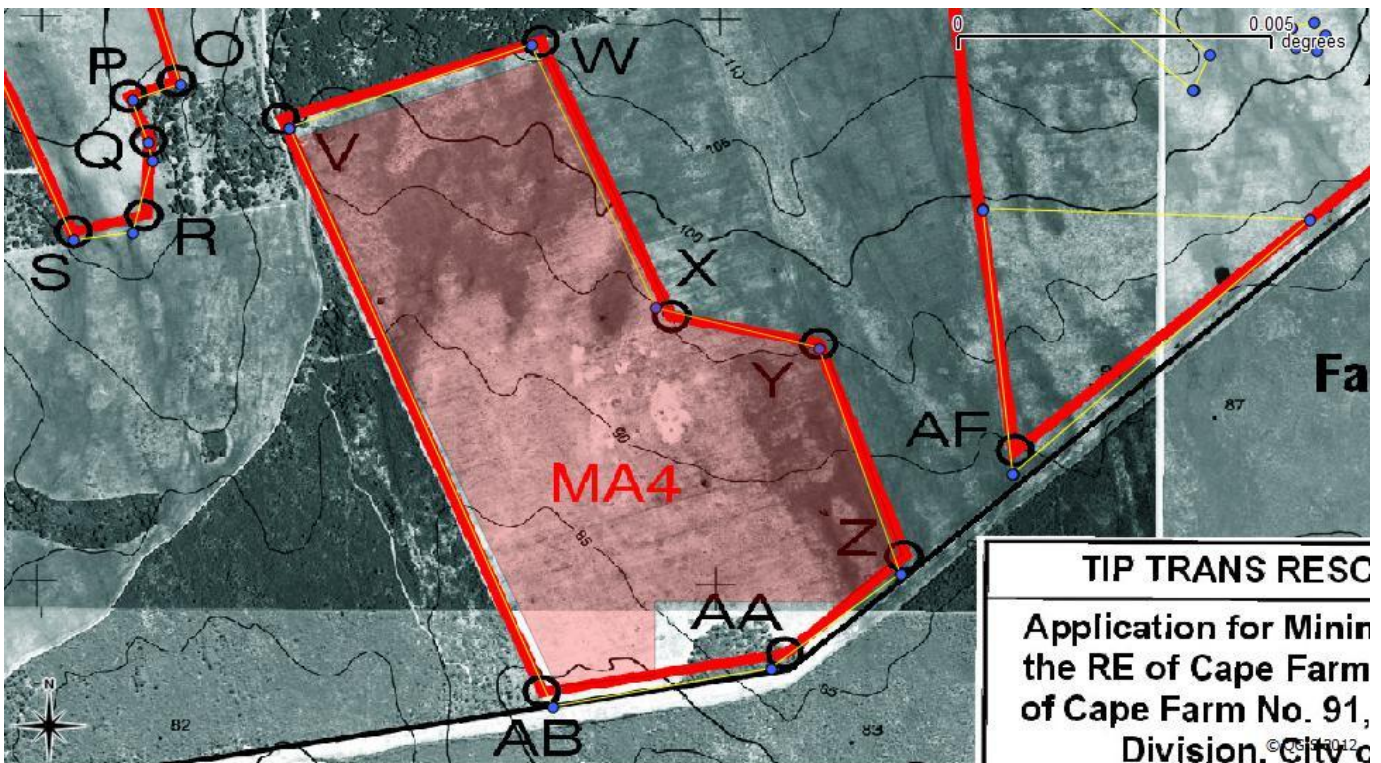


Figure 11; 2<sup>nd</sup> and Revised Alternative: MA4 will be known as RA4, a section in the south was removed due to botanical constraints

## 7. REVISED AND PREFERRED ALTERNATIVE

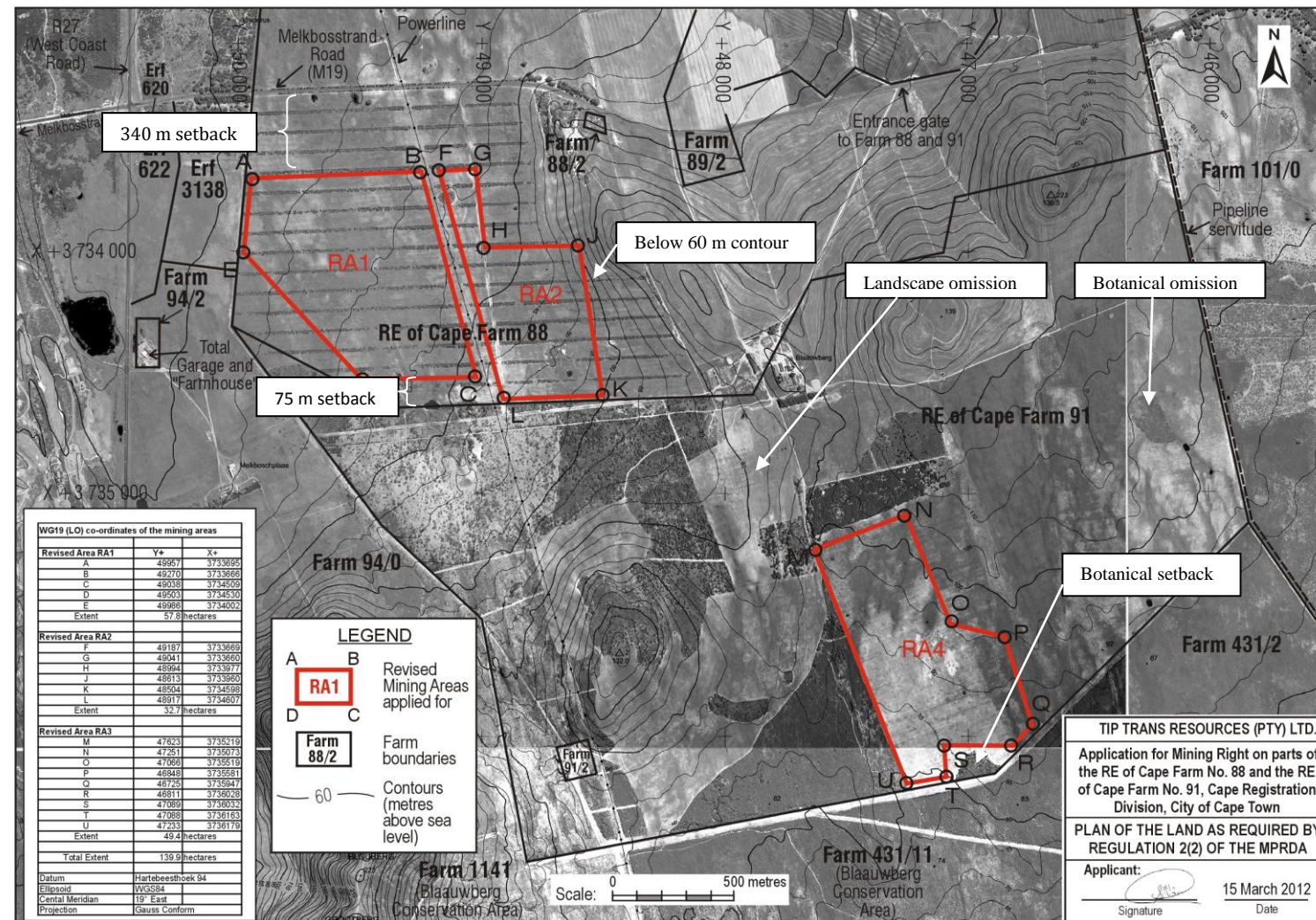


Figure 12: Revised and Preferred Alternative



## 8. HERITAGE IMPACT ASSESSMENT

### 8.1 Archaeological Impact Assessment

It was concluded that the proposed sand proposed mining operations on Remainder of Cape Farm 88 and Remainder of Cape Farm 91 will not have an impact of great significance on surface archaeological remains. The scatter of tools (475) in the blowout alongside the Eskom servitude will not be directly impacted by proposed mining activities, but will continue to erode and be exposed because of natural processes. Secondary (or indirect) impacts resulting from proposed mining operations may, however, affect negatively on this important site. Due to this a setback of 75 meter were introduced from site 475 to avoid impacts from the mining process. This area will be regarded as a no-go area.

Potential impacts on archaeological heritage	MA1(RA1)	MA2 (RA1)	MA3	MA4 (RA 4)	MA5
Nature of impact:	Negative	Negative	Negative	Negative	Negative
Extent of impact:	Site specific	Site specific	Site specific	Site specific	Site specific
Magnitude of impact;	Medium-low	Very low	Zero	Very low	Zero
Duration of impact;	Medium term	Temporary	Temporary	Temporary	Temporary
Probability of occurrence:	Possible	Unlikely	Unlikely	Unlikely	Unlikely
Confidence:	Sure	Certain	Certain	Certain	Certain
Degree to which the impact can be reversed:	Reversible	Reversible	Reversible	Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Replaceable	Replaceable	Replaceable	Replaceable	Replaceable
Significance rating of impact prior to mitigation (Neutral, Very Low, Low, Medium, or High)	Medium	Low	Neutral	Low	Neutral
Significance rating of impact after mitigation (Neutral, Very Low, Low, Medium, or High)	Low	Low	Neutral	Low	Neutral

**Table 4: AIA**

### 8.2 Palaeontological Impact Assessment

There is a low probability of terrestrial fossil bones being turned up in the mining excavations. Stone Age artefacts may be found buried in the upper part of excavations. With depth, it is possible that fossil plant and wood material could be found. It is important to obtain samples of this material. Residual marine deposits may overlie the weathered bedrock. The likelihood of fossil shell being preserved is low, but petrified, rolled bone fossils are quite common.

In view of the low fossil potential, it is proposed that only a basic degree of mitigation is required. Mitigation form part of the final recommendations below.

### 8.3 Historical Impact Assessment

It is apparent that the majority of casualties took place within the demarcated Blouberg Conservation Area. The strategic military/battle-lines on the historical maps do not overlap with the proposed sand mining area. According to the historical sources as analysed in this study, it is highly unlikely that a considerable number of burials occurred within the areas of Blaauwberg Farm where the proposed sand mining activities would take place. It is nevertheless not excluded that possible graves might have remained below the sand dunes or brushwood.

The Homesteads will not physically be impacted on, therefore the impacts is unlikely and very low. But in relation to the landscape significance the original alternative will have some impact on the Blaauwberg homestead, but with the revision of the proposal based on the guidelines provided the impact will be low. The Melkboschplaas homestead is outside of the application area located more than 800 meter from the closest mining area. The mining areas does not disconnect the homestead from the cultural landscape, therefore potential impacts are very low.

Potential impacts on historic resources	Graves	Graves	Homesteads	Homesteads
	Original Alternative	Revised Alternative	Original Alternative	Revised Alternative
Nature of impact:	Direct	Direct	Direct	Direct
Extent of impact:	Site specific	Site specific	Site specific	Site specific
Magnitude of impact;	Very low	Very low	Medium	Very low
Duration of impact;	Temporary	Temporary	Short term	Temporary
Probability of occurrence:	Unlikely	Unlikely	Possible	Unlikely
Confidence:	Sure	Sure	Certain	Certain
Degree to which the impact can be reversed:	Reversible	Reversible	Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Replaceable	Replaceable	Replaceable	Replaceable
Significance rating of impact prior to mitigation (Neutral, Very Low, Low, Medium, or High)	Low	Low	Medium	Low
Significance rating of impact after mitigation (Neutral, Very Low, Low, Medium, or High)	Very-Low	Very-Low	Low	Very-Low

**Table 5: Historic Impacts**

#### 8.4 Visual Impact Assessment

The visual impact relate to the cultural landscape integrity that needs to be maintained in order to avoid direct negative impacts.

**Original Alternative** – even though 1 ha will be mined and 1ha will be rehabilitate at one given time, the total area selected for the mining activity overlap visually and aesthetically sensitive areas. Intrusion into these areas will highlight the activities present that could result in the impact spreading beyond the local eye. The integrity of the BCA and biodiversity areas will also be impacted on.

Overall the impacts of this alternative can be rated as follow: A moderate visual exposure, moderate to low visual absorption, medium to low landscape compatibility and highly visible from the west.

Potential visual impacts:	MA1	MA2	MA3	MA4	MA5
Nature of impact:	Direct	Direct	Direct	Direct	Direct
Extent of impact:	Local	Local	Local	Site specific	Site specific
Magnitude of impact;	Medium	Medium	High	Low	Low
Duration of impact;	Short-medium term	Short-medium term	Short-medium term	Short-medium term	Short-medium term
Probability of occurrence:	Possible	Possible	Definite	Possible	Possible
Confidence:	Certain	Certain	Certain	Certain	Certain
Degree to which the impact can be reversed:	Reversible	Reversible	Reversible	Reversible	Reversible
Degree to which the impact may cause irreplaceable loss of resources:	Replaceable	Replaceable	Replaceable	Replaceable	Replaceable
Significance rating of impact prior to mitigation (Neutral, Very Low, Low, Medium, or High)	Medium	Medium	Medium-high	Low	Low
Degree to which the impact can be mitigated:	Possible	Possible	Possible	Possible	Possible
Significance rating of impact after mitigation (Neutral, Very Low, Low, Medium, or High)	Medium-Low	Medium-Low	Medium	Low	Low

**Table 6: Original Alternative Impact Ratings**

**Revised Alternative** – the degree to which this alternative adhered to visual and biophysical constraints mitigates the impacts identified in the original alternative significantly. Two of the areas were omitted completely, and allowing for visual setbacks of 340 meter next to the

M19, scenic route and no development above the 60-meter contour on the west of the hills reduced the likely visual impacts.

Overall, the impacts of this alternative can be rated as follow: A moderate to low visual exposure, moderate to high visual absorption, medium landscape compatibility and medium to low visibility from the west.

<b>Potential visual impacts:</b>	<b>RA1</b>	<b>RA2</b>	<b>RA4</b>
Nature of impact:	<b>Direct</b>	<b>Direct</b>	<b>Direct</b>
Extent of impact:	<b>Local</b>	<b>Local</b>	<b>Site specific</b>
Magnitude of impact;	<b>Low</b>	<b>Low</b>	<b>Low</b>
Duration of impact;	<b>Short-medium term</b>	<b>Short-medium term</b>	<b>Short-medium term</b>
Probability of occurrence:	<b>Possible</b>	<b>Possible</b>	<b>Possible</b>
Confidence:	<b>Certain</b>	<b>Certain</b>	<b>Certain</b>
Degree to which the impact can be reversed:	<b>Reversible</b>	<b>Reversible</b>	<b>Reversible</b>
Degree to which the impact may cause irreplaceable loss of resources:	<b>Replaceable</b>	<b>Replaceable</b>	<b>Replaceable</b>
Significance rating of impact prior to mitigation (Neutral, Very Low, Low, Medium, or High)	<b>Medium-Low</b>	<b>Medium-Low</b>	<b>Low</b>
Degree to which the impact can be mitigated:	<b>Possible</b>	<b>Possible</b>	<b>Possible</b>
Significance rating of impact after mitigation (Neutral, Very Low, Low, Medium, or High)	<b>Low</b>	<b>Low</b>	<b>Low</b>

**Table 7: Revised Alternative Impact Ratings**

### **8.5 Cumulative Heritage Impact**

Based on the findings and rating above it is clear that the original alternative poses the most significant impacts due to the encroachment into the scenic envelopes of the scenic routes. The occurrence of mining areas above the 60 meter contour when viewed from the west and the occurrence of mining sites on the viewshed close to the Blaauwberg homestead and in conservation worthy areas. The overall impact of this alternative can be rates as having a direct medium to high local impact.

The baseline HIA presented various recommendations to the applicant in order to reduce the impacts expected. These recommendations were immediately adopted, the original alternative was changed, and the revised alternative was presented. The revised alternative was setback by 340 meter from the M19, therefore no components of this alternative is located within the scenic envelope of the scenic routes. The setback also adopted the alignment of an existing windrow that will further mitigate visual impacts. The mining areas were setback with 75 meter from the archaeological site identified. Two of the mining areas were omitted based on cultural landscape and botanical reasons. Further setbacks from boundary fence lines and servitudes were adopted to avoid encroachment. Due to the described recommendations followed, the overall impact of this alternative relates to a direct medium-low, local, short-term impact.

## **9. CONCLUSION AND INTEGRATED RECOMMENDATIONS**

With regard to the proposed sand mining operations on Remainder of Cape Farm 88 and Remainder of Cape Farm 91 near Melkbosstrand, the following recommendations are made:

- The Original Alternative is rejected from a heritage point of view, only the mining areas as per the Revised Alternative can be supported.
- RA 1, RA 2 and RA 4 need to be clearly demarcated and existing access roads should be followed.
- Access roads should be kept as narrow as feasible, in order to minimize the development or expansion of new roads.
- Because mining of 1 ha and rehabilitation of 1 ha will run concurrently, limited to no infrastructure is required.
- Strict control on the 1ha mining and 1 ha rehabilitation area is required to avoid larger active areas at one given time.
- The 60 meter contour on the west of the viewshed above RA2 needs to be marked and no mining activity or equipment or roads are allowed above this contour.
- The identified archaeological sites need to be regarded as no go zones and this need to be clearly marked and fenced off for the duration of the mining activity with proper 1.2 meter wire fence
- A controlled collection of the scatter of tools (Site 475) in the sand blowout south of RA1 should be made. Surface sands should also be sieved in order to recover any buried artefacts and subsistence remains. The aim is to `rescue` the site and collect the material which could then be compared with remains from controlled excavations and other collections from elsewhere in the surrounding area. It is maintained that sand mining operations will, in all likelihood expose and destroy buried sites during the life cycle of the mine, and that the collection of the tools and possible dating of the site (from shell) presents an opportunity to mitigate the loss of important archaeological heritage to some degree. An application for an archaeological permit will be required, as per procedure below.
- It is recommended that an alert for the possible uncovering of heritage resources be included in the Mining EMP. This should also be included in the required environmental awareness training provided to workers at the sand mine.
- Appendix 2 in the PIA outlines general Fossil Find Procedures. This is a general guideline, to be adapted to circumstances. The PIA is attached under Annexure B and needs to be incorporated into the Mining EMP.
- In the event of possible fossil, archaeological or human remain finds, the relevant specialist must be contacted. For possible fossil finds, the palaeontologist will assess the information and liaise with the Mine Manager and a suitable response will be established. The following individuals and organisations should be contacted immediately:
  - Iziko Museums of Cape Town: SA Museum, 021 481 3800 - Dr Graham Avery. 021 481 3895, 083 441 0028.
  - West Coast Fossil Park - Pippa Haarhoff: 083 289 6902, 022 766 1606, [pippah@iafrica.com](mailto:pippah@iafrica.com)
  - Heritage Western Cape - Justin Bradfield: 021 483 9543 or Jenna Lavin: 021 483 9685

## **MONITORING:**

A regular monitoring presence over the period during which mining operations are conducted, by either an archaeologist or palaeontologist, is generally not practical. Especially in this case with an extended mining period and phased procedure of 1 ha at a time.

The Mine Manager, site supervisor and workers involved in mining operations must be trained and informed of the need to watch for potential fossil and buried archaeological material. All workers involved in work on the site are to be briefed on their obligations towards the controls and methodologies. The briefing will take place during the required environmental awareness training provided. Workers seeing potential heritage resource

objects are to report to the Mine Manager who, in turn, will report to the Environmental Consultant who will inform the relevant specialist.

To this end, responsible persons must be designated. This will include hierarchically:

- The Mine Manager who has the legal responsibility to ensure that the mining operations comply with all applicable legislation and regulations.
- The site supervisor, who is going to be most often in the field.
- The Environmental Consultant.

Routine inspection, recording and reporting of heritage issues should form part of a monitoring plan.

The Monitoring Plan is crucial for the implementation of the mitigating measures to ensure that the mine complies with its responsibilities with respect to heritage resources. This document needs to be incorporated in the Environmental Management Plan (EMP) for the proposed sand mine.

The following types and timing of monitoring are suggested:

- **Inspection:** random site inspection, annual routine inspection, action specific inspection.
- **Monitoring:** observation and photo records.
- **Review:** review of reports, plans and design.

Monitoring Plan Components

- **Pre-mining Phase** – this Integrated Heritage Impact Assessment and the conditions of approval issued by Heritage Western Cape
- **Mining Phase** –to ensure that the recommendations of the Integrated Heritage Impact Assessment and the conditions of approval are included in the Mining EMP. Heritage aspects must be included in the required Environmental Performance Assessment Reports that are submitted to the Department of Mineral Resources.
- **Closure Phase** – Any relevant heritage aspects must be included in the final performance assessment report and closure plan that is submitted to the Department of Mineral Resources when the application for mine closure is submitted.

#### **IN CASE OF AN APPLICATION FOR AN ARCHAEOLOGICAL OR PALAEOLOGICAL PERMIT THE FOLLOWING WILL APPLY:**

- A permit from Heritage Western Cape (HWC) is required to excavate archaeological material, graves or fossils. The applicant should be the qualified specialist responsible for assessment, collection and reporting.
- Should material be found that require rapid collecting, application for a permit will be made to HWC immediately.
- The application requires details of the registered owners of the sites, their permission and a site-plan map.
- All samples must be deposited at a SAHRA-approved institution.

#### **REPORTING REQUIREMENTS:**

Should material be found a detailed report on the occurrence/s must be submitted. This report is in the public domain and copies of the report must be deposited at the IZIKO S.A.

Museum and Heritage Resources Western Cape. It must fulfil the reporting standards and data requirements of these bodies.

The report will be in standard scientific format, basically:

- A summary/abstract.
- Introduction.
- Previous work/context.
- Observations (incl. graphic sections, images).
- Palaeontology.
- Interpretation.
- Concluding summary.
- References.
- Appendices

The draft report will be reviewed by the client, or externally, before submission of the Final Report.