

## **APPENDIX B**

### **Site selection process report**

**WASTE GIANT LANDFILL (PTY) LTD**

# ***Site Selection Report***

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***REPORT REFERENCE: 250-2009***

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## 1. INTRODUCTION

Waste Giant Landfill (Pty) Ltd is an established waste management company with operations including both the collection and disposal of general and hazardous wastes. The company is considered to be the fourth largest waste management company in South Africa and has been in existence since 1994.

In terms of the development and growth of the Waste Giant Landfill group, the need was identified for a comprehensive, integrated waste treatment and disposal facility, which would meet the requirements of the National Environmental Management: Waste Act No.59 of 2008 and the new National Waste Management Strategy (NWMS) that has been developed in accordance with the Waste Act. Adherence to the waste management hierarchy as described in the MWMS is of particular importance in this project.

In addition, there is an immediate need for appropriate waste treatment facilities for both hazardous wastes and health care risk wastes (HCRW). In particular, there would appear to be a shortage of HCRW treatment facilities on a national scale that comply with current air quality regulations. It is an acknowledged fact that the HCRW industry is in crisis with numerous incidents being reported nationally in the media, of illegal dumping and disposing of HCRW. This has resulted in a number of prosecutions which are still ongoing. The Waste Giant Landfill group has been involved in the cleanup of a significant number of these illegal disposal sites.

As a result of the above and the need to provide modern waste treatment and disposal facilities for many of their industrial clients, it was determined that a waste disposal facility was required to be located in the Johannesburg / Sasolburg

/ Vereeniging area preferably between Johannesburg and Vereeniging due to the client's existing business interests Johannesburg / Sasolburg / Vereeniging Area.

Landfill site selection is a fundamental step in the development of a landfill. The objective of landfill site selection is to ensure that the site to be developed is environmentally and socially acceptable and that it provides for simple, cost effective design which in turn provides for good operation.

The landfill site selection process begins in response to an identified need for a disposal site.

Using primarily environmental and economic criteria, sufficient candidate sites must be identified to ensure the due consideration of alternatives.

## **2. SITE SELECTION APPROACH**

The site selection will be based on the size and general location of the site.

### **2.1 Site Size Selection**

Waste quantities, calculated by the MRD, will determine the size classification of the site and this has to be taken into account during the site selection process. This calculation will provide a good indication of the physical size of the landfill and the area required to develop the landfill.

### **2.2 General Location**

This will be determined by the waste generation areas and will be economically sound practice to establish a landfill as close as possible to the generation areas.

### **3. ELIMINATION OF AREAS WITH INHERENT FATAL FLAWS**

It is a minimum requirement that no landfill site is to be developed in an area with an inherent Fatal Flaw in that they may prohibit the development of an environmentally or publicly acceptable waste disposal facility.

### **4. IDENTIFYING CANDIDATE LANDFILL SITES**

All possible alternative sites must be considered before making a final choice. It is a Minimum Requirement that sufficient candidate sites be identified to ensure the due consideration of alternatives.

#### **4.1 Economic Criteria**

Economic criteria relate to the cost of obtaining, developing and operating a site. They include the following consideration:

- The possible incorporation of the site into a regional waste disposal system, either immediately or in the future. This tends to make a site economically more attractive.
- The economies of scale. Larger sites are economically more attractive.
- The distance of the landfill from the waste generation areas. This is directly proportional to transport costs.
- The size of the landfill. In general, if it is to be economical, the landfill must cater for the disposal of the waste stream over at least the medium term to justify the capital expenditure.

- Access to the landfill site. This has cost convenience and environmental implications, especially if roads have to be constructed.
- The availability of on-site soil to provide low cost cover material. Importation of cover increases operating costs. Furthermore, cover shortage may reduce site life.
- The quality of the on-site soil. Low permeability clayey soils on site will reduce the cost of containment liners and leachate control systems.
- Exposed or highly visible sites. High visibility will result in additional costs being incurred for screening.
- Land availability and/or acquisition costs. These are often dependent on present or future competitive land-uses, such as agriculture, residential or mining.
- Other miscellaneous economic or socioeconomic issues. These might arise in particular instances, e.g. where the displacement of local inhabitants must be addressed.

## **4.2 Environmental Criteria**

Environmental criteria relate to the potential threat to the biotic and abiotic environment, particularly to water resources. They include the following considerations:

- The distance to ground or surface water.
- The importance of ground or surface water as water resources.
- The depth of soil on the site.
- The quality of on-site soil.
- Valleys where temperature inversion could occur.
- The sensitivity of the receiving environment.

### **4.3 Public acceptance Criteria**

Public acceptance criteria relate to such issues as the possible adverse impact on public health, quality of life, and local land and property values. They also relate to potential public resistance to the development of a landfill site. Failure to meet the public acceptance criteria may constitute a Fatal Flaw. The following are important considerations:

- The displacement of local inhabitants. This will usually arouse public resistance.
- Exposed sites with high visibility. These are less desirable than secluded or naturally screened sites.
- The sensitivity of the environment through which the access road(s) passes. The shorter the distance to the site through residential areas, the more acceptable the site.
- Prevailing wind directions. New landfills must be sited downwind of residential areas.
- The distance to the nearest residential area or any other land-use which is incompatible with landfilling. The greater the distance from incompatible land-uses, the lower the risk of nuisance problems and hence resistance to the facility

### **4.4 Procedure**

By eliminating all areas with associated inherent fatal flaws, and taking note of all the criteria and critical factors listed in this section, a number of candidate landfill sites can be identified. These may include or be supplemented by candidate landfills identified by IAPs and should be presented on a map of suitable scale



## 5. Ranking of Candidate Landfill Sites

### 5.1 Discussion

This section will discuss the facts pertaining to the candidate sites, using the main selection criteria, i.e. economic, environmental and public acceptance.

### 5.2 Candidate Landfill Site Ranking Matrix

Candidate Site	Economic Criteria				Environmental Criteria					Public Acceptance Criteria				Total Score
	Distance	Size	Access	Existing Impact	Ground Water	Surface Water	Soil Depth	Setting	Soil Available	Distance	Visibility	Wind	Etc.	
X	1	4	4	1	4	4	4	4	4	3	1	1		35
Y	4	4	4	2	4	4	4	4	3	3	2	2		40
Z	3	2	4	4	4	4	3	3	2	2	2	2		35
V	4	4	4	4	4	4	4	4	4	3	3	3		49

X – Blignautsrus Site

Y – Meydustris Site

Z – Walkerville Site

V – Vlakfontein Site

1 – 4 Score with 1 as low acceptance and 4 as high acceptance

## 6. FEASIBILITY REPORT

A site selection process was carried out in accordance with the Minimum Requirements for Waste Disposal by Landfill (DWAF, 1998). Three alternative sites were short listed and evaluated to determine their suitability for the intended use as described above. After due consideration of all the relevant criteria, it was decided that the existing De Deur Brickworks site (now disused) met with the required criteria in terms of the technical aspects of site selection.

### 6.1 Vlakfontein Site

The existing De Deur Brickworks (Vlakfontein Site) is considered to be a “brownfields” site due to the substantial disturbance of the land arising from significantly deep excavations for clay materials, stockpiling of brick wastes and derelict brick kilns and buildings that were used during the brick making operations.

The proposed development will therefore enable the rehabilitation of the existing site through properly engineered landfill, closure and rehabilitation procedures, which form part of the proposed development.

As part of the greening of the site, the undeveloped areas on the property will be appropriately fenced off and stocked with suitable game. Appropriate indigenous vegetation will also be planted on the site. The intention is to register the entire site as a nature conservancy and to utilise the site for educational purposes, both in terms of nature conservation and the industrial application of proper waste treatment and disposal.

The site is easily accessible from the R82, the Johannesburg / Vereeniging road, turning out onto Cronje Road, a 2km dirt road leading to the site. The site is also accessible for major highways leading to Vereeniging / Sasol area.

The site is 100ha and will meet the client's requirements.

## **6.2 Meydustrria Site**

Even though the Meydustrria site can be classified as a brown field site and has a height score in terms of the ranking matrix, it is located within 3000m of a landing strip of an airfield.

The site is easily accessible from the R82, the Johannesburg / Vereeniging road, turning out onto Boundary Road, a 2km dirt road leading to the site. The site is also accessible for major highways leading to Vereeniging / Sasol area.

The site is approximately in 110 ha and will meet the client's requirements.

The site is currently used for quarrying and brick making and will not have the same impact on the environment when considering an undisturbed site and will suit the requirement of the client.

## **6.3 Walkerville Site**

Walkerville Site is an existing Landfill Site surrounded by green fields site and has limited land available for future extension.

The site is located next to the R82 next to Walkerville and is easily accessible via a dirt road.

The size is limited to 10ha and thus will not meet the requirement of the client.

## 6.4 Blignautsrus Site

Blignautsrus site is located closer to Johannesburg on the R82, however due to the distance from the Sasol / Vereeniging area, it is not economical viable for further consideration.

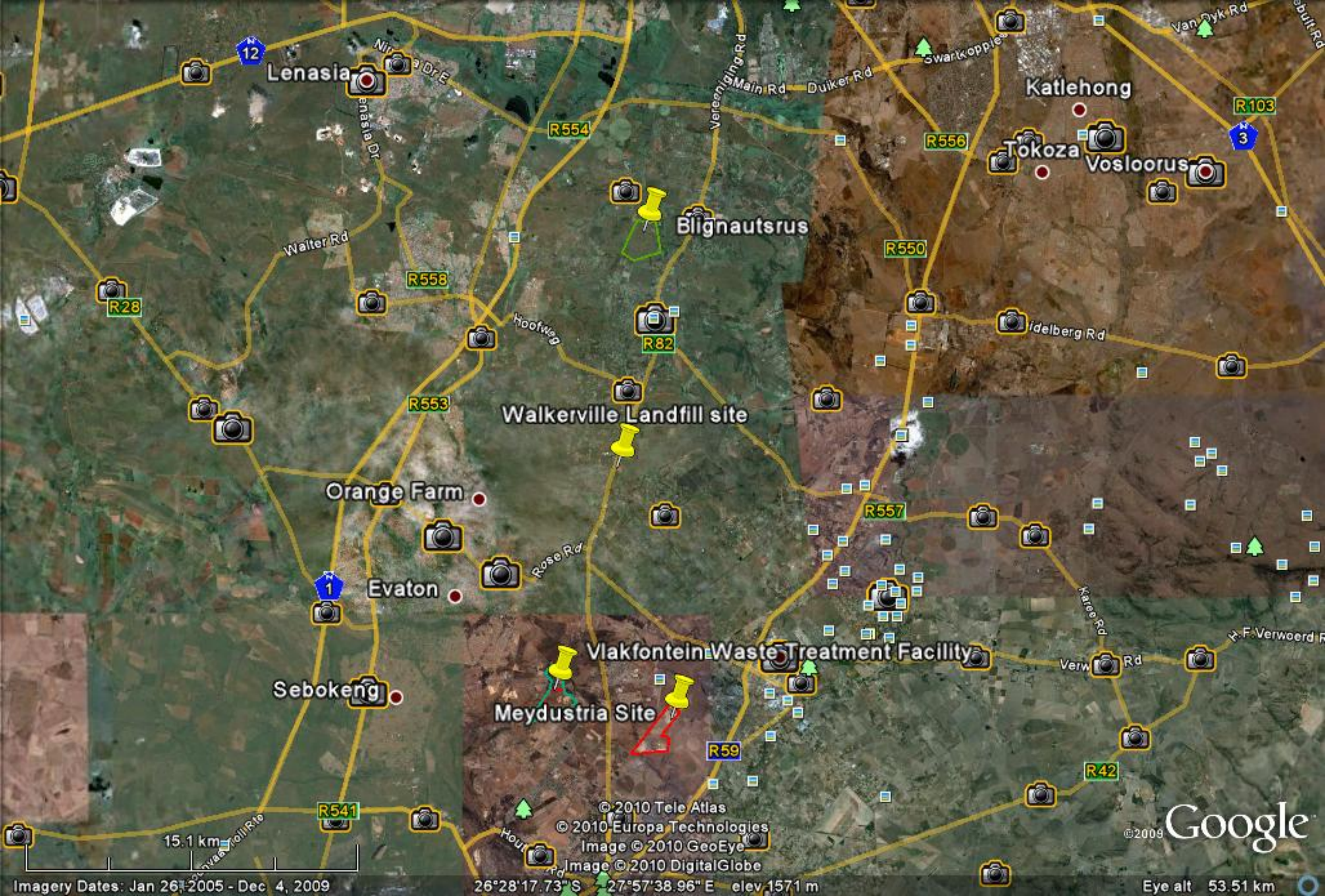
The site is also located on undisturbed land and would not be an environmentally friendly choice.

The site is approximately 190ha and would be more than what is required currently.

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E de Jager

26 Sep 2010

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Lenasia

Blignautsrus

Walkerville Landfill site

Orange Farm

Evaton

Sebokeng

Meydustria Site

Vlakfontein Waste Treatment Facility

Katlehong

Tokoza

Vosloorus

15.1 km

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Imagery Dates: Jan 26, 2005 - Dec 4, 2009

26°28'17.73" S 27°57'38.96" E elev. 1571 m

Eye alt 53.51 km