

## DESCRIPTION OF ALTERNATIVES

### 1 IDENTIFYING ALTERNATIVES

The IEM procedure (Department of Environmental Affairs) stipulates that an environmental investigation needs to consider feasible alternatives for proposed developments.

This means that for any project that is proposed, there should be a number of possible proposals or alternatives for accomplishing the same objectives or meeting the same need. The developer should be encouraged to consider alternatives that would still meet the objectives of the original proposal, but which would also have an acceptable impact on the environment (referring to physical, biological, socio-economic and aesthetic/visual).

### 2 REASONABLE RANGE OF ALTERNATIVES

Possible alternatives were identified through discussions with authorities, discussions with I&AP's, reviewing of existing environmental data bases and the client (Vodacom).

Alternatives can be categorized into the following:

- Location alternatives;
- Activity alternatives;
- The "no-action" alternative.

#### **a) Location alternatives**

According to baseline information that was collected by the environmental consultant, it will not be necessary to consider location alternatives on account of the possibility that biological components might be disturbed significantly. The site is located on the Farm Havercroft 99 KT on a mountain near the premises of the Havercroft Mine, Modubeng area within the Fetakgomo-Tubatse Municipality area.

Motivation for not assessing other alternative site locations is given as follow:

- Vodacom intends to erect a 55m lattice type mast with a container housing the electronic equipment. The size of the base station will measure approximately 12m x 12m (144m<sup>2</sup>) in extent. The area to be disturbed is therefore relatively small and limited natural vegetation will need to be disturbed, except for some small trees.
- The erection of a 55m mast is required to improve the cellular coverage and capacity for residents in the area.
- The proposed location (highest point in the area) of the proposed mast was also selected as it will improve the transmission link between the site and other base stations in the surrounding area.

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- The proposed mast will also provide opportunity for co-using (share sites) with other cellular companies (unlike the existing small mast near the site which is not shareable).
- The location of the mast is determined by the area that it is intended to provide cellular coverage for.
- The current site is located in the middle of the area or the “cell” where Vodacom intends to provide cellular coverage.
- The topography of the area also determines the position where the mast can be located as obstacles like ridges or mountains can prevent certain areas from receiving coverage.
- The site for the base station is currently vacant and is not being used by the landowner (except for grazing for cattle).
- The site consists of an open rocky area, surrounded by natural vegetation, limited natural vegetation will however need to be cleared, except for three small *Commiphora Mollis* (Velvet corkwood) trees and some shrubs.
- No rare or endangered fauna or flora species were identified on the proposed site during the site visit.
- The proposed site is therefore suitable for the proposed base station.
- There is an existing access road (4x4 track) being used to the existing mast located near the proposed site. A new access road of approx. 70m will be made to connect the site with the existing access road. Damage/removal of any large trees will be avoided during the construction of the access road.
- Due to the fact that the infrastructure in question will be a 55m high mast located on a mountain, it is deemed important that the visual impact be minimized. The proposed mast will be a lattice mast and one can look “through” it. This will assist to lessen the visual impact. Vodacom will implement elements of good visual design. An existing telecommunications mast is located approx. 140m from the proposed mast.
- Unnecessary stressing/impacting of the environment can be mitigated through the implementation of the recommendations contained in the BAR. The impact on the environment will therefore not be significant. Other alternative sites are thus not feasible as the impact of the base station is bound to have the same environmental impact (or more) at other locations in the vicinity of the proposed site on the mountain.

## b) Activity alternatives

The proposed mast, in itself, represents an alternative to the conventional telephone lines. Cell phone networks reduce the number of poles significantly, and circumvent the theft of copper wires.

Activity alternatives that were investigated include the type of mast to be constructed i.e. monopole versus lattice type mast versus a tree type mast.

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The preferred alternative is that of a lattice structure. The advantages of a lattice type structure, is that it allows for many types of radio systems to be used i.e. also point-to-point microwave systems providing transmission to other masts in the area. If a mast is built with co-using/sharing in mind, less masts needs to be built as many of the sectional pole (mono-pole) type masts are not suitable for co-using and are unsuitable for many point-to-point systems as only one height is available for these systems at the crow's nest. On a lattice mast, point to point systems can be mounted on any platform with sufficient line of sight and for Omni directional purposes (coverage), the top 10 - 15m of the mast can be utilized. In general, maintenance is more simplified on a lattice mast, as there is more space to work on the mast with its different platforms.

A tree type mast was also investigated but was found not to be feasible due to the following reasons:

- It will not be possible to construct a tree type mast at a height of 55m, which Vodacom requires, as the wind loading (i.e. the force on a structure arising from the impact of wind on it) on such a mast will be too high. Tree type masts are therefore only manufactured on lower heights (35m and lower).
- A tree type mast will not have the capacity/mounting space to accommodate all the equipment (dishes and antennae) Vodacom intends to install than that compared to a lattice mast.
- It will also limit the possibility for sharing with other cellular companies.

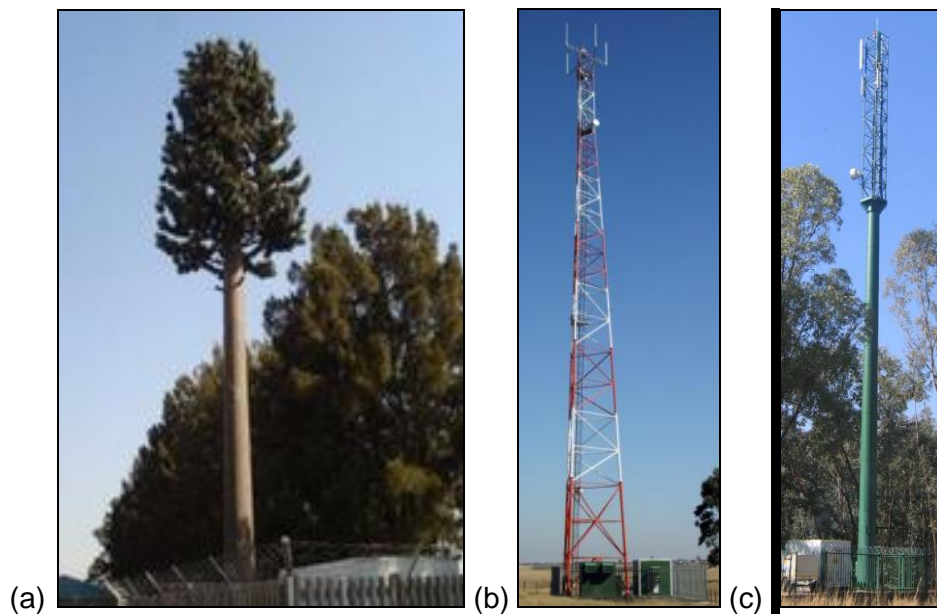


Figure1: Different Mast types investigated: (a) Tree type mast (b) Lattice mast (c) Monopole

### **c) No action alternative**

The Department of Environmental Affairs stresses the consideration of the “no development/no-action” option in cases where a proposed development is envisaged to have significant negative environmental impacts, or where such impacts cannot be mitigated against effectively or satisfactorily. The IEM procedure suggests that the “no action” option should be considered as an alternative. This option is normally considered during a full EIA where significant negative environmental impacts are expected or if the proposed site is considered to be ecologically sensitive or unique.

Due to the extremely limited extent of the proposed mast site (144m<sup>2</sup>), the impact upon fauna and flora will be minimal.

The cell phone coverage and capacity (including the transmission link for the surrounding base stations) will remain problematic in the area should this activity not take place. Should the mast not be built on the proposed site, an alternative site must be planned.

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