

Abstract

The City of Johannesburg exists primarily due to the discovery of gold, and its urban form has largely been shaped by the mining strip that runs from east to west along the gold reef. The City initially grew along the mining axis, with the Central Business District (CBD) developing just to the north of the belt. Today, the strip of mine tailings and slimes dams creates a vast space of leftover, mostly undeveloped land adjacent to the City centre. The south of the City is physically separated from the north by this strip of wasteland, and most current development is usually only directed northwards towards Sandton and Pretoria.

This study considers the future significance of the mining brownfields and how the land can be re-claimed, re-used and re-developed in order to structure and enhance the urban landscape of Johannesburg. The mining strip represents the divisive and collective history of the City and can potentially be used to create the connective tissue that could address this division and ultimately form a cohesive Johannesburg. The linear mining strip is currently supported by railways and industry and as such, provides an ideal setting for development, as useful infrastructure is already present.

Brownfield sites, which are previously-developed urban sites with a potential for re-development, and specifically mining brownfield sites, form the core of the research for this study. The tailings and slimes dams of Johannesburg require extensive reclamation and reprocessing, yet provide the ideal landscape for redevelopment. The variety of brownfield sites, as well as the different ways to approach them is discussed within this document.

In order to validate the extensive effort that is required to overcome the many issues associated with redeveloping the Johannesburg mining sites, the theory of Compact Cities pioneered in the Netherlands has been investigated and is used as a case study in this document. The current segregated and dispersed format of Johannesburg is not sustainable, and all future development should aim for a denser City, greater mixed-use environments and the predominance of public transport.

The focus initially will be on developing the land within the City, rather than that on the outskirts, focusing primarily on the vacant land of the mining belt. Careful consideration will be given to the fact that the natural environment is a key aspect to a future sustainable City, and reviews of where this theory has been successfully implemented form a basis to the proposal of this design. This study considers the use of natural landscapes as the catalyst for development within Johannesburg. Natural systems are crucial to the form of the City and can create the base for the linkage of open space systems, which is used to structure future development. Natural mitigation techniques are also one of the best ways to remediate brownfield sites

Lastly, the specific history and character of the City of Johannesburg, and specifically the mining belt, is considered in this document, as certain factors will define the process of re-development. The existence of the Witwatersrand Reef and the historical development of the City have led to the current status quo of the City. This thesis studies the patterns of growth that the City has followed and how it has been impacted by gold mining.

The design portion of this thesis begins by forming a proposal to create a movement system within Johannesburg based on the existing natural space networks. It considers integrating the mining belt with this system in order to create a new structuring device to inform the development of the urban form of the City.

The second part of the thesis attempts to construct a strategy that can be used in the development of the vacant land along the mining belt, based on the above-mentioned open space system for Johannesburg. A pivotal site within Johannesburg has been identified in order to test the principles and concepts that have been explored. There are many challenges that arise when developing on former mining land and this thesis attempts to address these issues spatially, through an urban design framework.