

# **A Knowledge-Based Approach to Municipal Solid Waste Disposal Site Development in the Karstified Dolomitic Terrain around the Town of Tsumeb in North-Central Namibia**

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## **Abstract**

Pragmatic and sound engineering practices are vital in the designing municipal waste disposal sites in karstified dolomitic terrain for the protection of water resources particularly in arid and semiarid environments such as Namibia where water is a scarce resource. Practical site-specific solutions can thus be focused on the influences identified at various stages of the site development from desk study to restoration and aftercare. This study has been based on a knowledge-based approach covering the influences of local climatic, environmental and ground data sets. The climatic data relevant to municipal solid waste disposal site development include precipitation, evapotranspiration, temperature and wind data. The environmental components comprise the type of industrial activities, the amount and type of waste, likely contaminants associated with different types of waste, local ecological and community settings. The ground data sets comprise the regional and local geological, geomorphological, surface and groundwater data sets. In addition, *in situ* and laboratory tests that include index properties of rocks and soils, mineralogy and water chemistry formed part of the ground data sets. The influences and interactions of climatic, environmental and ground data sets on waste disposal site development are vital to environmental protection. The results from this study indicates that climatic, environmental and ground data sets all have direct influences on the selection, designing, management and restoration of municipal solid waste disposal sites in karstified dolomitic terrains.