

RISK ASSESSMENT TO DETERMINE SOURCES OF IMPACT ON COASTAL STORM WATER: THE CASE OF JEFFREYS BAY (SOUTH AFRICA)

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It is projected that by 2025 three-quarters of the world's population will live in the coastal zone. This is an alarming statistic, with a consequently significant impact on small coastal towns and the adjacent marine environments. Developing communities within the coastal zone of South Africa have proved to be a significant pollution source of storm water. Studies have shown that storm water that is deposited in the ocean will be trapped in the near shore marine environment causing poor seawater quality over a large distance. Furthermore, this can pose a significant threat to the health of recreational users and important marine ecosystems. In Jeffreys Bay storm water quality is thought to pose a threat to the maintenance of the international Blue Flag status for its beach. The aim of the project was to investigate the main sources of storm water and subsequent marine pollution at Jeffreys Bay and to develop an appropriate management strategy using the integrated environmental management framework. In order to achieve this objective, it was also necessary to determine the current quality of storm water at various points within the catchment and near shore marine environment. Even though the storm water was found to be severely contaminated no evidence existed for a negative impact on the marine environment. None the less, a precautionary approach was adopted and a risk assessment employed in order to consider potential impacts on the marine and aquatic environment, human health and socio-economic welfare within the town. Significant sources of storm water contamination included grey water, domestic solid waste disposal and informal ablution. These significant aspects were further investigated by means of a photographic method to obtain semi-quantitative data for the spatial and temporal

variation of solid waste and also to identify most likely sources of solid waste. This information was combined with that of a survey amongst different stakeholders that made use of semi-structured questionnaires. The finding was that solid waste management in the catchment was poor with significant quantities of waste being disposed of by mainly domestic sources (76%) which confirmed the outcome of the risk assessment. The semi-structured interview method was also used to assess the current status of grey water management and sewage disposal within the storm water catchment. It was estimated that a total of 24m³ of grey water was being produced within the informal sector of the catchment per day. Most of the grey water was being disposed of into open spaces (58%) where it posed a health and environmental threat. A direct link between the storm water canal and potentially the marine environment was evident. The quality of the grey water was regarded as sufficient to have an impact on storm water quality, although the magnitude of impact on the marine environment was not known. There fore grey water disposal was considered a risk and a significant aspect. The survey revealed that the sanitation situation within the informal area of the catchment were indeed inadequate with a 28:1 toilet to household ratio. The insufficient number of toilets appeared to be the primary cause of problems, although the community's awareness of the correct use of the facilities was also problematic. There fore informal ablution was considered a risk and a significant aspect confirming the outcome of the risk assessment. Due to the fact that all the significant aspects were human waste related, an integrated waste management plan (IWMP) in the form of a descriptive model illustrated a holistic approach which integrated various technologies with a strong emphasis on participation and education in addressing the significant aspects. Such an approach would not only facilitate the reduction of marine pollution from storm water, but also allow for sustainable community-based development.