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NKAYI WATER TREATMENT FILTERS

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**COLLEN BUTETE
(N950203M)**

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ABSTRACT

This project is a design of Nkayi water treatment filters. Three filter alternatives namely slow sand filters, rapid mono-media filters and rapid multi-media filters have been designed. The most suitable filter type have been arrived at after carrying out an economic analysis. The cost-benefit analysis and capital cost recovery methods were used to obtain the most economic filter and filter with the least cost. The slow sand filter was found to possess both qualities. To achieve a successful end result this project involves:

- Carrying out laboratory test on Shangani River sand available in the locality and sand from Criterion water works.
- Finding the suitability of each sand, basing^{ed} on the parameters obtained from the laboratory tests, for use on the filters.
- Applying the sand parameters in filter hydraulics computation (having found the filter type the sand is best suited for) such as lamina losses in the filter bed, in the process of finding the depth of the filter box.
- Sizing the filters using the design flow and filtration rate.
- Writing a bill of quantities using results obtained from the design of the filters, to be used in the economic analysis.