

## **MINE DEWATERING BY VERTICAL WELL-POINT SYSTEM: CASE STUDY - CITY STONE QUARRY AT SALVATION ARMY FARMS (MURANG'A COUNTY)**

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### **ABSTRACT**

City Stone Quarry experiences frequent flooding due to lack of suitable drainage system. Poor drainage and the high water table of the area makes flooding a constant drawback to mining activities. The water comes directly from the heavy rainfall, Aberdare highlands and indirectly from semi confined aquifers. Proper drainage is necessary to ensure that mining operations can continue unhindered. Vertical dewatering wells are one of the various methods of dewatering surface mines. The use of vertical dewatering wells is important in excluding ground water from seeping into the mine thus a dry ground for efficient operation of the mine. This project studied the geophysical information of the quarry and the results were interpreted and analyzed. The data was used to design two dewatering wells for the project area with a discharge of 432 m<sup>3</sup>/day per well. The vertical dewatering wells should be drilled to a depth of at least 88 m below ground level and diameter of 0.19 m to ensure that the deeper aquifer will be fully penetrated. The two dewatering wells will have a radius of well influence of 344.9 m for the arbitrary quarry length of 1500 m. The construction of the two wells will lead to the lowering of groundwater levels hence providing a dry excavation area allowing quarrying to occur unhindered and reduce pore water pressures thus improving stability of the quarry walls and floor.