**Correlation between Cost and Performance of Drinking Water Pipe Network during Normal Operating Conditions**

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**Abstract**

Nowadays, large expenditures are spent on maintenance and rehabilitation of water distribution systems due to lack of performance. This research work is concerned with investigating the relationship between the cost of a certain water distribution network design and its performance during normal operating conditions. Noting that performance is expressed by an efficiency index. By analyzing eighteen alternative designs of a particular networks, it has been concluded that the efficiency of water delivery is inversely proportional to the cost of a water distribution system with a strong coefficient of determination. Also, increasing the number of pipes in a network would result in more leakage problems and subsequently lower efficiency. Finally, the proposed equation that describes the cost-efficiency relationship can be effectively utilized to determine the cost of a design with desirable efficiency or the efficiency corresponding to a known cost.