

UDF ANALYSIS USING HYDRAULIC MODELING

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Abstract

Flushing is one of the most effective tools available to maintain and improve water quality in a water distribution system. Almost all water utilities use some form of flushing program in a regular maintenance schedule. However, these flushing programs are not typically sequential and often do not use valve isolation techniques. Adopting a Uni-directional flushing (UDF) program will result in significant system improvements and cost savings. Uni-directional flushing consists of isolating particular pipe sections or loops by closing the appropriate valves and opening hydrants in an organized sequential manner. Earth Tech Canada has developed a new computer-based UDF approach aiming at a systematic cleaning of the pipes of the City of Penticton (BC, Canada) water distribution system. Hydraulic and fire flow simulations were performed to identify the flushing sequences as well as the expected flushing velocities for each pipe. By spatially joining different Geographical Information System (GIS) database layers and the hydraulic model, the valves to close were identified for each flushing sequence as well as the hydrant to open. Finally, this new computer-based UDF approach is easy to implement and results in immediate and long-term solutions to water quality concerns by determining the optimal flushing sequences.