

Evaluation and Proposal for Improvement of the Flow Measurement Equipment in the Bellavista Drinking Water System of the City of Azogues

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Abstract : The present article carries out an evaluation of the drinking water system in the Bellavista sector of the city of Azogues, with the purpose of determining the appropriate equipment to record the actual consumption flows of the inhabitants in said sector. Taking into account that the study area is located in a rural and economically disadvantaged area, there is an urgent need to establish a control system for the consumption of drinking water in order to conserve and manage the vital resource in the best possible way, considering that the water source supplying this sector is approximately 9km away. The research began with the collection of cartographic, demographic, and statistical data of the sector, determining the coverage area, population projection, and a provision that guarantees the supply of drinking water to meet the water needs of the sector's inhabitants. By using hydraulic modeling through the United States Environmental Protection Agency Application for Modeling Drinking Water Distribution Systems EPANET 2.0 software, theoretical hydraulic data were obtained, which were used to design and justify the most suitable measuring equipment for the Bellavista drinking water system. Taking into account a minimum service life of the drinking water system of 30 years, future flow rates were calculated for the design of the macro-measuring device. After analyzing the network, it was evident that the Bellavista sector has an average consumption of 102.87 liters per person per day, but considering that Ecuadorian regulations recommend a provision of 180 liters per person per day for the geographical conditions of the sector, this value was used for the analysis. With all the collected and calculated information, the conclusion was reached that the Bellavista drinking water system needs to have a 125mm electromagnetic macro-measuring device for the first three quinquenniums of its service life and a 150mm diameter device for the following three quinquenniums. The importance of having equipment that provides real and reliable data will allow for the control of water consumption by the population of the sector, measured through micro-measuring devices installed at the entrance of each household, which should match the readings of the macro-measuring device placed after the water storage tank outlet, in order to control losses that may occur due to leaks in the drinking water system or illegal connections.

Keywords : macrometer, hydraulics, endowment, water

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