INVESTIGATION ON WATER LOSSES IN RETICULATION SYSTEM AT UTHM CAMPUS

FKAAB,UTHM

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Background

- The university had been reported with high water rates and water quality problems. High water bills are not only due to financial charges, but also because more essential water can be lost. There are several big issues that can occur in the areas as a result of water losses. Water leakage from the pipes is often seen as a lack of water. Leaking pipes are enough to inflict damage to the structure.

- Bad water quality, deformed and polluted walls, parasitic black mould and floods are some of the ways in which leaky pipes ruin the entire structure and end up costing a fortune. If the issue persists, it could be expensive to repair the wall and patch the plumbing behind it. Mold from leaked pipes causes serious health problems to students and needs to betackled promptly.

- The more it gets ignored, the worse the harm will be. The problem had no solution up to this point. This investigation also established a method for determining the method to find water loss by using a bulk and volumetric meter which is already installed by UTHM management in all of the distribution pipes for each building to calculate the volume of water supplied and the volume of water lost to classify the leaks. The inquiry also helped to suggest that the proper decision be sought to fix water loss problem if the loss issue appears. Figure 1 shows the location of investigating the water losses.

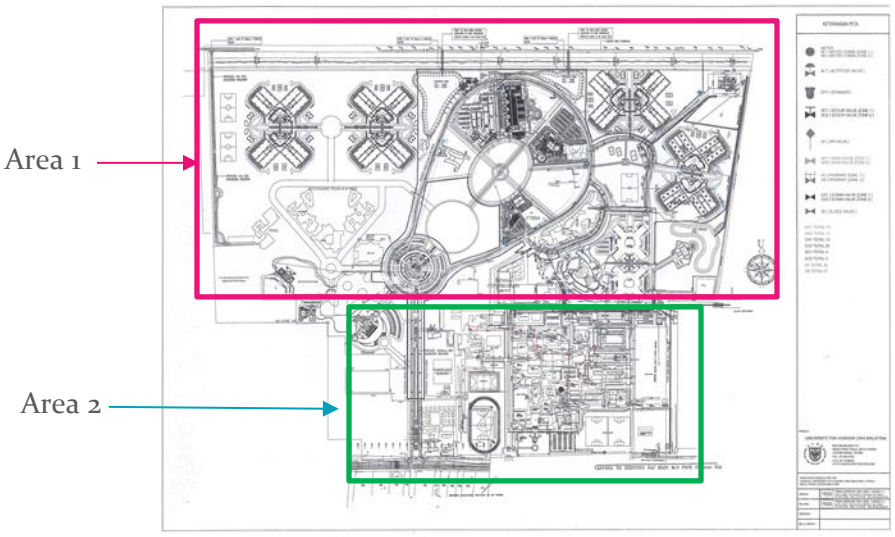


Figure 1: Location of investigating water losses for Area 1 and 2 (UTHM)

Objectives

The objectives of the investigation are to:

- determine the percentage of water losses using water balance method.
- evaluate the effectiveness on AWWA software for the purpose of finding water losses.

Scope of works

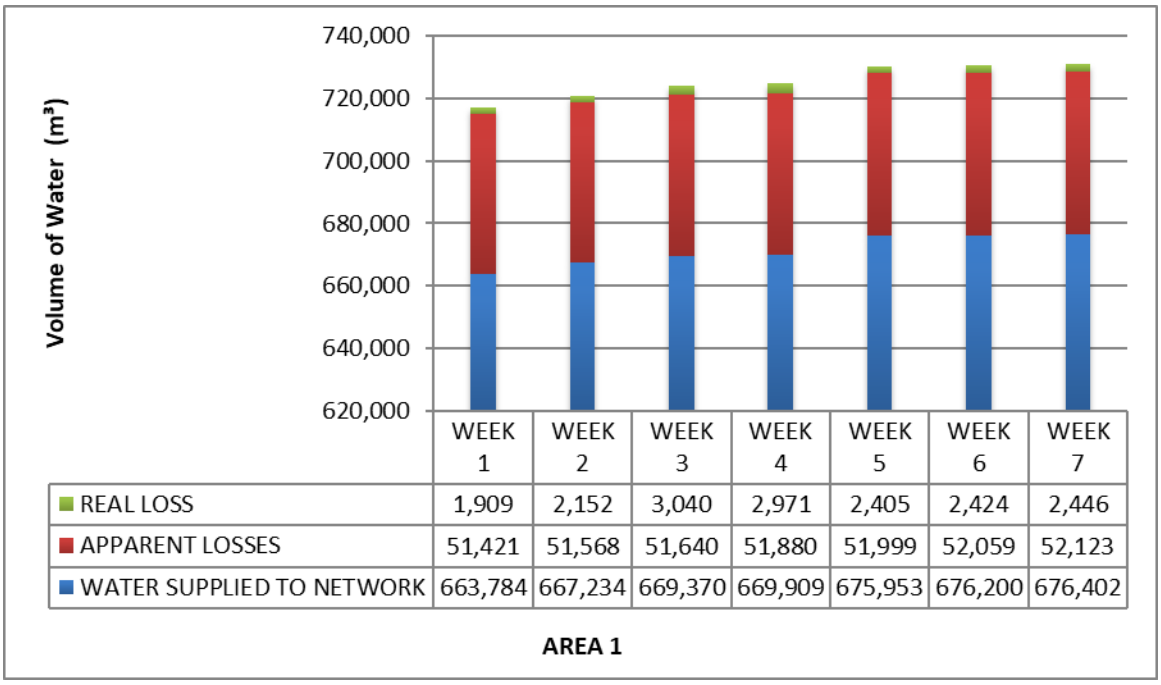
- The main focus of this project was to determine and determine the percentage of water losses using water balance method. The investigation had been carried out around UTHM campus area and estimated the volume of water distributed and identified the percentage of losses. Existing bulk and volumetric water meter in water supply system will be used to identify the volume of water. This investigation will take 7 weeks to complete and the average time to record water volume data would be about 1 pm in the afternoon where the water flow usage is at peak as full flow such that the data will be collected at maximum flow. The UTHM water reticulation map was also used to identify the main pipe and to assess the accuracy of the map indicating the position of the pipelines, valves and for all regions. Water reticulation map is providing the most valuable details, since the project relies on the location of the pipe.

Significant of study

- Reducing water losses involves protecting huge quantities of renewable resources and saving water bills. The effect of minimising water loss is to minimise running costs due to reduced electricity and solvent consumption and lower water loss charges. After that, it will improve the productivity and image or integrity of water providers, especially in the management of water losses. Reducing water losses would provide a balanced water supply strategy for future generations. This research is also important and this approach can help to solve the problem of water loss. In addition, this is the appropriate way to address the dilemma that emerges from the water distribution system that can lead the waste of clean water.
- water loss as the difference between the device input volume (water generated) and the billed consumption (or metered and unmetered consumption) of all customers (plus exported water) will be recorded for an assessment period of 7 weeks. If the losses are greater than 25 %, the distribution system will be affected or the region

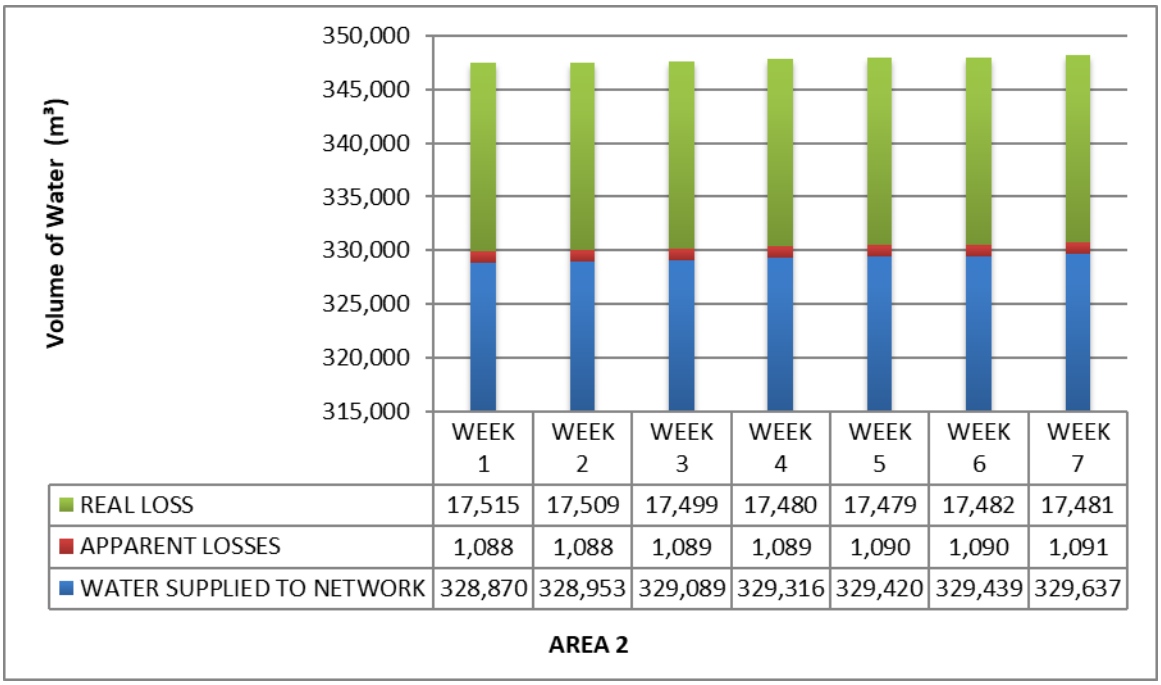
would have a water loss problem. The causes and types of losses can be identified by defining this. This study would allow the University to solve the high water bill issues if water bills are caused by the loss of water. Higher water bills are most commonly caused by leakage, changes in water usage or human factors. So, by finding the losses, the management of UTHM can be aware of this and find a solution to the crisis.

Figure 2: Bulk meter capsule reading



	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7
REAL LOSS	1,909	2,152	3,040	2,971	2,405	2,424	2,446
APPARENT LOSSES	51,421	51,568	51,640	51,880	51,999	52,059	52,123
WATER SUPPLIED TO NETWORK	663,784	667,234	669,370	669,909	675,953	676,200	676,402

Figure 3: Volume of water for Area 1



	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7
REAL LOSS	17,515	17,509	17,499	17,480	17,479	17,482	17,481
APPARENT LOSSES	1,088	1,088	1,089	1,089	1,090	1,090	1,091
WATER SUPPLIED TO NETWORK	328,870	328,953	329,089	329,316	329,420	329,439	329,637

Figure 4: Volume of water for Area 2

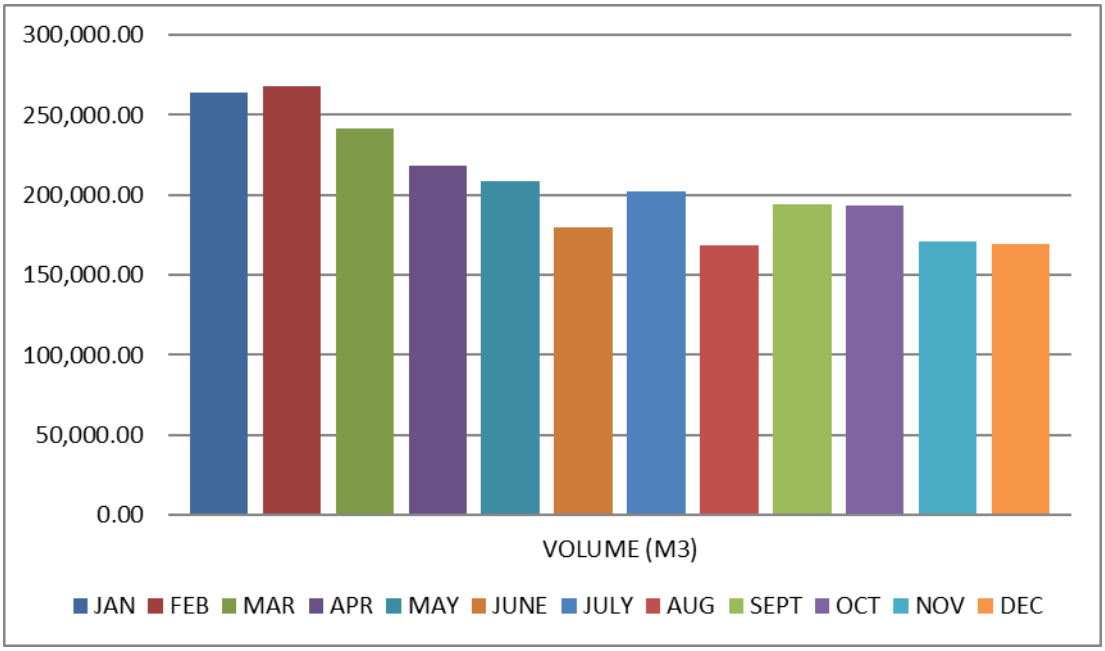


Figure 5: Volume of Water Consumed in Year 2020