

## In This Issue

- District Measurements

### The NRW Problem:

Millions of Gallons of Non Revenue Water

Millions of Dollars Spent On Treating a Symptom Rather than Solving the Problem!

Not all Meter Replacement Programs are Cost Effective!

Not All Leak Detection Programs Are Successful!

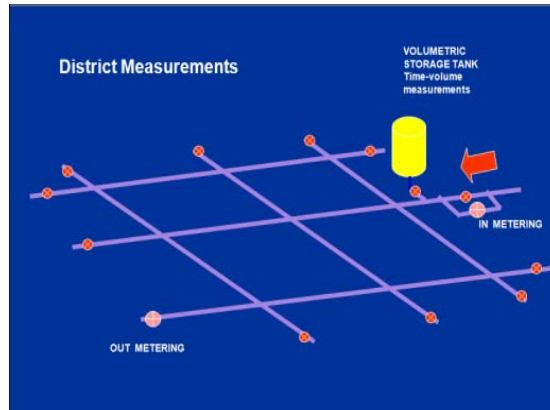
**JBS Offers Cost Effective, Long Term Solutions!**

**"Our revenue increase was nearly double what was projected."**

*JBS Selected for Water Accountability Projects at Agua SUD and Brownsville PUB. JBS completes Water Audit in Pharr, Texas.*

## District Measurements

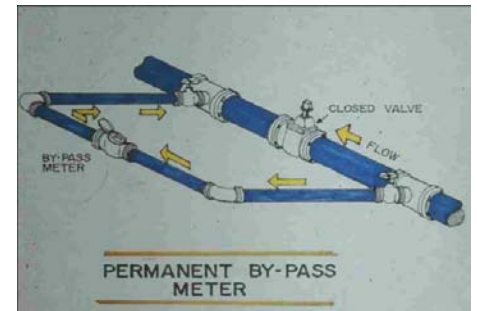
Leak detection by itself is not an exact science. It is labor intensive, and can be expensive and in some cases may not be successful. Pipe material, system pressure, soil material, and water table levels can all have an impact on the success of a leak survey. Not to mention the equipment used and the experience of the leak detection specialist. Not all leaks can be pinpointed with existing technology



Historically it has been shown that the 80:20 rule holds true when reviewing leak detection and line break trends. In other words 80% of the problems are usually found in 20% of the pipe network. The concept of district measurements (recent

terminology: District Meter Areas or DMA) is one tool that we often use to reduce the leak detection effort required, allowing focus on the areas with the greatest potential for leaks and consequently water loss recovery. The detail and effort required for district measurements may vary from simple night flow recording and elevated tank drawdown to installation of permanent meters or by-pass meters.

DMA's are a way to manage or reduce the size of a water system into smaller segments, districts or zones. They may be set up for 24 hour monitoring of an area or simple nighttime or early morning monitoring. Nighttime flow measurement is a good way to determine leakage potential in a given area. The volumetric drawdown of elevated tanks over a known time period, or the use of by-pass meters for this purpose are two long standing methodologies that can work well.



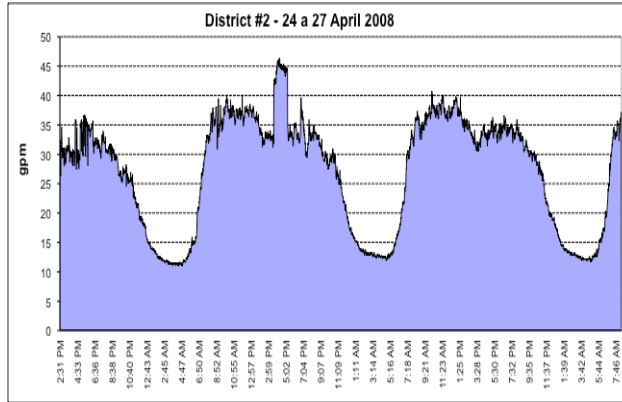


**Is a Meter Sizing Problem contributing to lost Revenue?**

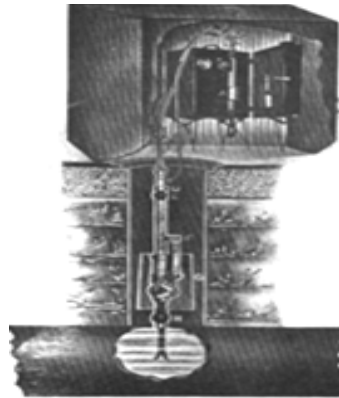
**"We had a 10 times payback the first year by following the recommendations of the Water Audit."**

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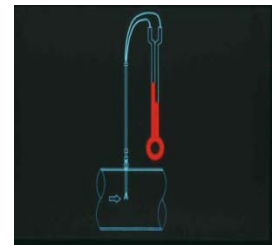


Data loggers can be used to record flow every few seconds, while the hundreds or thousands of distribution meters in each DMA need to have their usage estimated unless AMR/AMI capabilities exist and the total flow of each meter in a district can be recorded over the same time period as the district meters. A district may contain a few hundred to a few thousand customer connections. The size of a district may vary considerably depending on the water system, customer type, valve integrity, pressure issues, and mapping integrity.

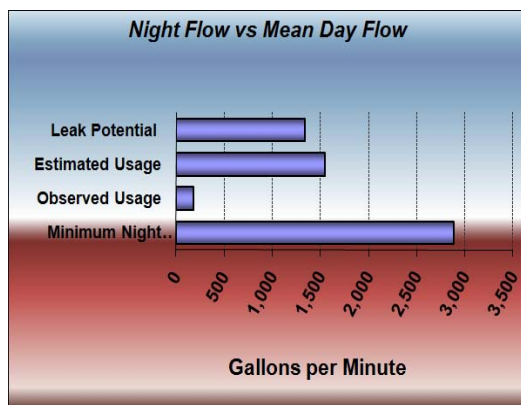


For the record, in the U.S., District Measurements were first used in Terra Haute, Indiana in 1896 when Edward Smith Cole perfected his pitot rod flow measuring device, which he called the "Pitometer". It enabled him to accurately measure rates of flow into a valve isolated area of the distribution system, which was later referred to as a "Pitometer District".

The Pitometer, a differential pressure meter was the first portable water meter that could be used for district measurements. For the next 90 years, not much changed with DMA measurements. However,



today we see a myriad of metering and digital recording devices being used for district measurements ranging from the pitot rod,



turbine meters, MAG meters, and ultrasonic meters. The concept remains the same: To identify water loss potential and to measure performance improvements after remediation of problems. The advent of AMR/AMI meter reading technology offers changes to the face of district monitoring, enabling the usage from all metered accounts to be totaled during the district measurement. However, this feature also adds a significant level of cost to this kind of diagnosis.

Night flows can provide a quick "yes or no" answer as to magnitude of leakage in a district.

Utilities should implement an in-depth water audit and not just a "paper" audit.

In this time of fiscal concerns, the cost benefits and revenue enhancements derived by conducting a full system Water Audit are more crucial than ever.

### The Pros and Cons of DMA's:

The positive aspects of this approach are:

1. Measurement of flows into discrete areas.
2. Excellent control points to better manage water system distribution.
3. NRW issues can be better monitored and reduced.
4. Leak detection efforts can be focused where the greatest benefit can be obtained.
5. Greater knowledge of system performance is derived and data may be used in hydraulic modeling.
6. Effectively applied, the results of this approach will lead to cost savings and improved operating efficiency.
7. This leads to on-going capability to monitor district night flow status for determination of future leak detection and or infrastructure replacement needs.

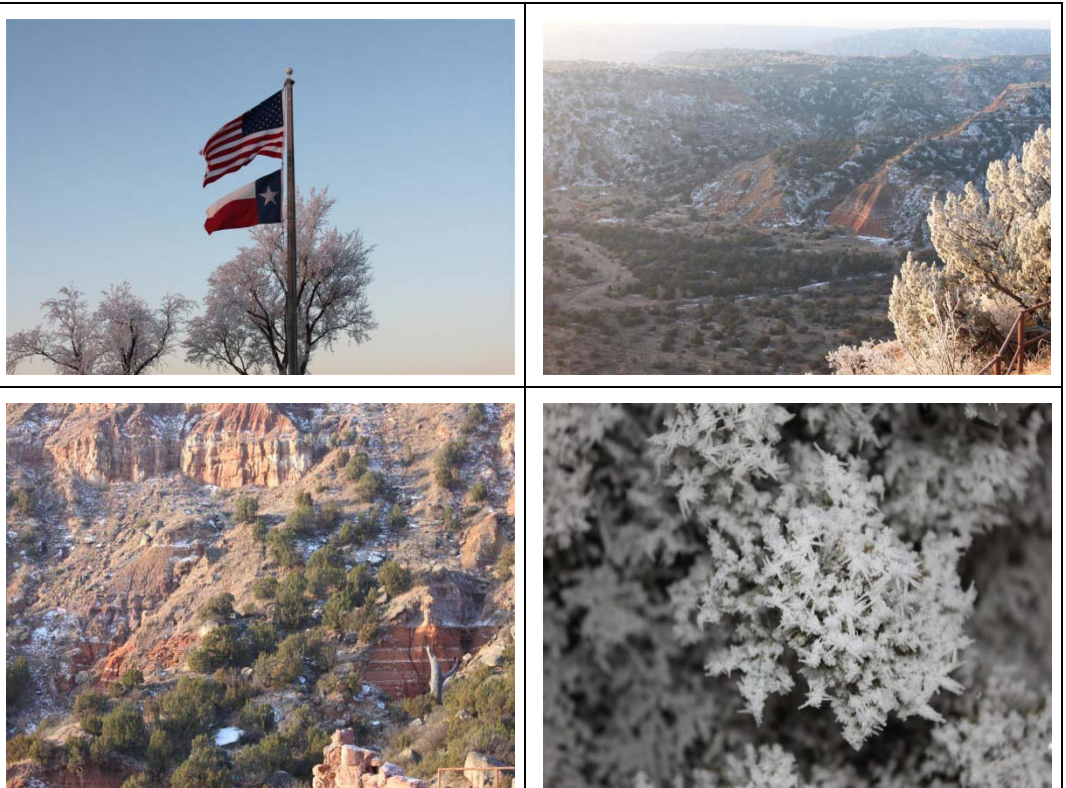
The negatives of DMA's to consider are:

1. Inaccurate mapping will impact measurements and consequently accuracy of results.
2. Valves are lost or are not operable: potentially same impact as for item 1.
3. If recorded metered account consumption data is not reliable, diagnosis is difficult.
4. Less effective in industrial areas with high nighttime use. Each high use account needs to have meters read during the exercise.
5. May be too expensive to accomplish depending on the water system (justify the extent or level of detail and investment required for such a program).

### In Conclusion:

The technology is available to conduct DMA measurement in combination with leakage analysis, leak detection and infrastructure replacement. Whether it is done in-house or contracted out, significant results and cost benefits are achievable.

*The following are a few pictures taken in January at Palo Duro Canyon State Park in Northwest Texas. A fascinating geological area. Hoar frost in all trees and vegetation on that cold January morning. Lots of wildlife present.*



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JBS Does Not Sell Products or Participate in Revenue Sharing Programs.

We have nothing to gain from our recommendations, but their successful implementation by our clients.

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