

Dugouts, wells or pipelines?

BY DR. HANS PETERSON
SAFE DRINKING WATER FOUNDATION

Sixty years ago, in an effort to increase available water supplies on the Canadian prairies, the Prairie Farm Rehabilitation Agency (PFRA) implemented a dugout construction program. Farmers who had inadequate water supplies became self-sufficient by harvesting their own water through collection in dugouts. This was an effective way to increase water supplies and today there are more than 100,000 dugouts in use across the prairies.

Each dugout traps around one million L (1,000 cubic meters) of water each spring, making around 100 million cubic meters of "new" water available for farmers. The quality of dugout water is generally excellent if we test for inorganic chemicals, such as low levels of Total Dissolved Solids and low to moderately hard water. But, when we test for dissolved organic and particulate organic material, such as bacteria, viruses and protozoans, dugout water often present serious-but solvable-problems.

During the 1970s, North American engineers dreamed of piping water over long distances from areas with good water supplies to areas lacking adequate water. Pipelines supported by various levels of government now crisscross the U.S. and Canadian prairies. Never before have government agencies provided such large subsidies to secure on-farm water supplies. These subsidies vary, but are commonly around \$7,000-\$10,000 for each farm. Typically, the subsidy covers up to half the cost and the individual user pays the rest.

Most people would assume that only good quality water is piped and that it is safe to drink without further treatment. This is not necessarily the case. Provincial government agencies will frequently designate water from a pipeline as "raw" even when it has been treated to some extent. The "raw" designation means that the water from these pipelines does not need to be monitored for quality and is exempt from chemical and biological testing. This invites poor management practices, both in water treatment and

pipeline maintenance. People supplied with water via government-supported pipelines often do not treat the water on-farm. As a result, many people are drinking such water "raw".

Even water of good quality can deteriorate to unacceptable levels if it stays in the pipeline for a long time. This happens often in rural areas. A 1995 survey by the U.S. Environmental Protection Agency found that maintenance of distribution systems in rural communities in the U.S. is often poor. The EPA also found that many small communities lack the resources to initiate or carry out the steps necessary to upgrade their systems. The United States implements far more stringent water quality regulations than Canada and a similar situation exists in Canada although it is not as well documented. As long as no monitoring and assessment is carried out no guidelines are broken!

Given that piped water needs to be transported for long distances and also treated at point of use, the question should be asked: Is pipeline construction the most cost-effective solution to rural water quality improvement or is improvement of existing supplies more appropriate?

A systematic approach to evaluate the quality of water supplies is urgently needed, for both economic and health reasons. Some areas that government agencies and we, as wise consumers, ought to educate ourselves on are:

- The chemical and biological quality of rural water from dugouts, wells and pipelines;
- By what means, with what result, and at what cost can the water be treated?
- Will the transport of the water in pipelines deteriorate the quality of the water?
- After treatment, can the water be safely disinfected without generating new problems?
- What are the comparative costs, both economic and health, of the rural supply options?

Unfortunately, a system to carry out this evaluation has not been developed for rural water supplies. Developing this capability should be seen as an urgent priority for government agencies making decisions about water. Without it, it is not possible to objectively determine whether piped water is a better solution than improving on-site water supplies.

Farmers also need answers to the above questions to make informed decisions about whether to sign on for a pipeline project or whether to continue using on-farm water supplies. For example, how a water looks can be deceiving. A poor looking water supply may be easier to treat to safe standards than a good looking water supply. When pipeline projects are promoted without technical information to back up the merits of the quality of the piped water supply (not only at the source, but when it reaches the farm) they don't deserve to receive any monetary support from the public.

Government agencies promoting piped water supplies also need to be able to provide potential users with sustainable solutions for how the water should be treated on-farm to make it safe for drinking. Simply stating that it is a raw water line and the water needs to be treated is like selling a car without any instructions for what type of oil filter should be installed and how often it needs to be changed.

For many years government programs have favoured the construction of pipelines over and above other solutions to water supply and quality problems. Supply problems have certainly been solved by pipeline construction. But, supply is often not the issue, quality is, and quality problems have been ignored. Effective ways to solve severe dugout and ground water problems may in the long run be far more cost-effective than treating a water source, piping it long distances, and then re-treating it in-house. ■