

Awareness Information Pamphlet #9

American Ground Water Trust

# **Rural Drinking Water: Private Wells Or Public Water Supply?**

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*This pamphlet contains information about rural water supply. It has been prepared to help communities and individuals discuss and make decisions about local water supply issues.*

## **INTRODUCTION**

Private wells in rural and suburban areas provide water for 40 million Americans every day. Plans to provide a public water supply in a rural area often cause local controversy. On the one hand, there is the opinion that private wells are adequate and that some rural supply systems have been created or extended into areas where there is neither hydrologic nor economic reason. On the other hand, there is the view that a rural supply system can bring improvements to rural infrastructure, the local economy and public health safety.

Communities where a public water system is proposed should consider all aspects of the issue. This pamphlet contains a simple "check list" of questions which may help to define the problem and assist in decision making. Local water resource policy decisions should be based on hydrological facts and economic realities and not on conjecture and anecdote. As a first step, arguments for or against a rural water project need accurate unbiased information about quantity, quality and reliability aspects of the local water sources.

## **DRINKING WATER**

### **Where Do We Get It?**

The U.S. is rated as one of the safest countries in the world for drinking water quality. All drinking water is obtained from some part of the hydrological system; either rivers, lakes or ground water. For over 150 million Americans, drinking water is supplied from ground water.

There are over 200,000 public water systems in the U.S. of which 60,000 are called Community Systems. By definition, a community system serves more than 25 people or has more than 15 piped connections. Eighty percent of the community water systems have ground water as a source. Of the 140,000 small Non-community Systems (less than 25 people), 97% use ground water. In addition to those using public water supplies, 40 million Americans obtain their drinking water from 15 million private wells.

## **WATER QUALITY**

### **What Can Threaten Supplies?**

Most private wells in the U.S. provide safe water for home uses. Virtually all private domestic well water is used for drinking without treatment. The natural chemical quality of ground water varies from region to region because of the influence of the local soils and rocks through which water moves and is stored.

In some areas there is concern about contamination in rural wells. Aquifer contamination may result from point sources, such as leaking fuel storage tanks, animal feedlots and septic systems. In suburban and rural areas, the use of chemicals such as fertilizers and pesticides can be a non-point source of aquifer contamination. Landfills, mine

wastes and industrial wastes may also threaten rural ground water quality.

A contaminated water sample from a well does not necessarily mean that the whole aquifer is contaminated. Inadequate septic systems or improper handling of chemicals near wells can lead to localized contamination. Older shallow dug wells without properly installed casing are more easily polluted than drilled wells. In the same area where there is some shallow well contamination, deeper ground water from properly constructed wells may be perfectly wholesome and fit to drink.

An area of localized aquifer contamination, such as a chemical spill, can often be contained by remedial action. Knowledge of local ground water movement and proper monitoring may still allow the safe use of ground water in the surrounding area.

## **WATER QUANTITY**

### **What Can Diminish Supplies?**

Wells in aquifers may be compared with drinking straws in a glass of water. The question may be asked: how many straws can be used before the glass runs dry? The answer depends on the size of the glass, how often it is refilled, how deep in the glass the straws are, and how much is used by each straw.

Too many wells, too much consumptive use, and extended dry conditions can impact aquifers. However, most domestic wells use a very small amount of water in relation to the amount of ground water stored in the surrounding area. Depending on local geology and residential lot sizes, many home wells are hydrologically independent of neighboring wells. It is possible that a home well may be affected by nearby pumping, especially if it shares an aquifer used for

irrigation. Deepening the home owner's well can often solve the problem.

A possible reason for a decline in a well's yield may be chemical or biological incrustation in the well, or a worn and inefficient pump. An apparently failing well does not necessarily mean there is a failing aquifer. Clogged wells can be rehabilitated, and pumps can be replaced.

## **HOW DO RURAL SUPPLY SYSTEMS START?**

The creation of a "rural water district" is often the starting point for a public water supply system. A rural water district is a legally authorized organization created to provide and sell water to consumers. A water district may be proposed by authorities in political subdivisions such as counties and municipalities. Groups such as nonprofit organizations, private corporations and Indian tribes may also form water districts and may be eligible for federal financing. To facilitate the process, many states have given a quasi-government status to groups seeking to establish a water district. The initial legal framework for creating a water district may be established without the knowledge of the local community the water district expects to serve.

Federal financial assistance for rural water projects has been available since the 1930s. The original intention of federal support was to improve the quality of life for rural Americans and thus help reduce migration from rural to urban areas. The National Rural Water Program began in 1961 and the (then) Farmers Home Administration (Department of Agriculture) was given power to make loans and grants to water districts. Today the program is administered by the U.S. Department of Agriculture; Rural Utilities Service.

The principal factors usually involved in rural water supply decisions are perceptions of water reliability, water

quality, and the associated costs and benefits. Cost considerations include land values, capital investment, maintenance and operating costs, and rate and pricing structures. Many rural water districts have ground water as their supply source. The private well or public water supply issue is not one of choosing between ground water and surface water.

## **RURAL WATER SUPPLY CONTROVERSY**

The statements arrowed below have been selected to show some of the issues, concerns and confusion surrounding local rural water proposals. The arguments have been used by citizens, engineers and water supply officials to support and oppose the creation of rural supply systems. Some of the statements can be used for either point of view. Many are based on opinion rather than fact. It is important to remember that each local area is different, and careful study of health, economic, geologic and hydrologic information is needed to assess technical questions. Is the statement relevant for your area? What is the answer?

For technical questions, usually :

yes [ 4 ] no [ ✖ ]

Matters of opinion are far more subjective:

yes[ ☺ ] [ ☹ ] perhaps [ ? ]

Most water supply decisions are political and involve:

[4] [ ✖ ] [ ☺ ] [ ☹ ] and [ ? ]

⇒ Annual costs of a home well are less than  
purchasing public water

o

- ⇒ Health officials have no authority over the water quality of private wells ○
- ⇒ Chemicals added to public water supply can cause health problems ○
- ⇒ My well water was excellent but they made me connect up ○
- ⇒ Rural water districts protect their well recharge areas ○
- ⇒ One backflow prevention failure could contaminate the whole pipeline ○
- ⇒ By the time we heard about the pipeline plans it was too late to stop it ○
- ⇒ Providing other social services would have a greater impact on public health 😊 ☹
- ⇒ Utilities should be supplied by or controlled by local government 😊 ☹
- ⇒ Regional planners need centralized control over water supply 😊 ☹
- ⇒ If we are not allowed to use local aquifers, why bother to protect them? 😊 ☹
- ⇒ Rural public water systems create an expensive bureaucracy 😊 ☹
- ⇒ Rural public water systems may encourage “sprawl” housing development 😊 ☹



## QUESTIONS THAT NEED TO BE ASKED

The questions listed below under the headings of **Quantity**, **Quality** and **Economics**, may help stimulate community discussion about resource options.

### Water Quantity

One reason to propose a rural water system is that the existing water sources are inadequate and that no additional source is available locally. However, before proceeding with a pipeline, the evidence for the shortage needs to be scrutinized, and the supply problem assessed using proper scientific criteria. If there is reliance on anecdotal evidence of shortage, and if there is no assessment of the local resource potential, then there could be an exaggeration of the problem, and an unnecessary expense for the community.

### Questions

- ⇒ Is there a documented case of water shortage?
- ⇒ Have water conservation measures been considered?
- ⇒ Are current sources using all local resource capacity?
- ⇒ Has there been an independent assessment of ground water potential?
- ⇒ Were bedrock sources considered?

- ⇒ Will imported water impact local hydrology and ecology?

### **Water Quality**

Public health concerns may be the reason for proposing a rural supply system. Contaminated aquifers are usually difficult to clean up to drinking water standards. Before considering other source options, the basis used for assessing health risk, and the extent and source of contamination need to be established. Individual wells may be contaminated because the well was not properly constructed. For some types of localized contamination there may be an on-site solution. Disinfecting the well may restore safe water. A new well, with protection of the well head area may be needed. However, some chemical contamination of aquifers is more widespread and is more difficult to remedy.

### **Questions**

- ⇒ Were the water quality data obtained by a statistically unbiased survey?
- ⇒ Does the water quality data distinguish between drilled wells and dug wells?
- ⇒ Are the water quality problems chemical or biological?
- ⇒ Are wells with poor quality located near potential contamination sources?
- ⇒ Has the quality problem been reviewed in a long term hydrologic context?

- ⇒ Would a waste water treatment system be a less expensive solution?

### **Water Economics**

A third reason for proposing a piped rural water system may be to encourage regional development. There may be economic benefits to the local area from increased development of water supply infrastructure. Some residents may prefer not to have increased development. A major economic concern for residents will be the monthly cost for their water supply.

### **Questions**

- ⇒ Were accepted planning criteria and economic models used to project demand?
- ⇒ What economic activity will take place if supply is improved?
- ⇒ Will the pipeline encourage “sprawl” of housing developments?
- ⇒ Who will benefit? Will the environment be adversely impacted?
- ⇒ Is the viability of the scheme dependent on low interest federal money?
- ⇒ Do the people proposing to create or extend a pipeline stand to benefit financially?
- ⇒ How will costs of pipeline water compare with self supplied systems?

- ⇒ Is connection compulsory? Will restrictions be made on using existing wells? o
- ⇒ Is there a budget to properly abandon wells that might become redundant? o
- ⇒ Will increased fire protection be a benefit of the rural water system? o

## **COMMUNITY WATER DECISIONS**

### **Viewpoint A**

- \* The issue of local water supply policy should be of concern to all rural citizens.  
The only way to be effective in public debate about rural water supply is by having good information on which to base decisions.
- \* Posing the right questions is important to get the right answers.
- \* Citizens have a right and a responsibility to be involved in policy decisions that affect them directly.

### **Viewpoint B**

- \* Water resource issues are too complex to allow participation by the public.
- \* Experts and government officials are best able to decide policy, free from the (emotional) concerns of the public.

Viewpoint B, with little attempt to involve the public, can lead to local worry, resentment, and biased policy decisions.

The most effective approach in deciding local water supply issues includes citizen involvement. Those affected by water

supply proposals should have the right and the opportunity to support those proposals or to challenge their assumptions, to cross check hydrological and financial calculations, and to suggest other strategies. The free flow of information and up-front declaration of vested interests should be ingredients of the decision making process.

Check into what is happening in your community. What answers do you get concerning water supply issues that may affect you and your community?

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**The starting point for good decisions is good information!**

**American Ground Water Trust  
Consumer Information Line  
1-800-423-7748**

*Additional Trust Publications*

- ❖ **Americas Priceless Resource** – An introduction for the homeowner to the occurrence of ground water in the hydrologic system.
- ❖ **Septic Systems for Waste Water Disposal** – This pamphlet explains how septic systems work.
- ❖ **Bacteria and Water Wells** – Describes the natural occurrence of bacteria beneath the ground, how wells may be affected and how to fix them.

**AMERICAN GROUND WATER TRUST**  
*Independent Authority on Ground Water*

*The American Ground Water Trust is a 501(c)(3) non-profit membership organization. The mission of the Trust is to protect America's ground water, promote public awareness of the environmental and economic importance of ground water and provide accurate information to assist public participation in water resources decisions.*

To learn more about how you can protect your ground water:

Call the Trust's consumer information line 800-423-7748.

**Join** the American Ground Water Trust. [Home owners are important Trust members.]

**Contact** the Trust about ground water issues and concerns in your town, region or state. The Trust will respond to your questions and recommend a course of action.

**Volunteer** to help with educational programs and special events in your area.

**Request** a list of Trust Educational Products.

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