



Rural Wellhead Protection Fact Sheet

INTRODUCTION TO WELLHEAD PROTECTION

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INTRODUCTION

One of the most important factors in assessing overall *quality of life* is the availability of safe drinking water. In Wyoming, most rural residents rely upon groundwater as their source of drinking water. The need to protect the safety, or quality, of our groundwater supplies can be seen everyday in news reports of groundwater contamination across the country. Many of these problems might have been prevented if the understanding of how groundwater becomes contaminated were better understood in the past. What has become better understood are the steps that can be taken to protect private wells, and the aquifers which provide water to them, from becoming contaminated. Prevention can, and should, play a major role in protecting your water supply.

Potential Sources of Contamination to Drinking Water Wells and Supplies

Potential sources of groundwater contamination are typically in the form of wastes (human, animal, industrial) or products (fuel, solvents, household cleaners) containing chemical elements or compounds known or suspected to be toxic or harmful to humans. Many of these potential sources are fairly obvious to the casual observer, such as aboveground chemical/fuel storage tanks. However, many other potential sources (or source pathways) are not so obvious: poor well construction; underground and above ground fuel storage tanks; household cleaners; pesticide and fertilizer application, mixing, loading and storage areas; animal feeding and confinement areas; and septic systems are a few that are common to most rural residents. These potential sources, and many others, can lead to the contamination of drinking water supplies, not to mention the inconvenience and expense involved in cleaning up contamination and perhaps, in some cases, having to treat or replace drinking water wells.

Some aquifers within Wyoming are by nature unsuitable for drinking due to the presence of naturally occurring minerals and chemical compounds such as salts, selenium, radionuclides, and flouride. Typically, some type of in-home treatment system is necessary to reduce the concentration of these potentially harmful substances to suitable or safe levels prior to consumption.

Potential Causes of Contamination to Drinking Water Wells and Supplies

Drinking water wells and supplies can become contaminated when a release, or discharge, of a waste or product (and the harmful chemicals within it) reach either the well or the aquifer supplying water to the well. Such releases frequently result from accidental spills, improper disposal, or careless use of a product. The likelihood that a release will have an impact on a drinking water well or aquifer is usually dependent upon several factors, including the distance from the release to the well; the presence or absence of protective seals around and within the well; the depth to the aquifer; the permeability of materials that overlie the aquifer; and the direction that groundwater is moving.

Identifying Groundwater Contamination

Changes in taste, appearance, odor, or color of your water might indicate that you have a contamination problem. However, many contaminants are not detectable to normal human senses at concentrations considered unacceptable for human consumption. Most contaminants can be harmful to human health at very low levels, or concentrations, and require sensitive laboratory equipment in order to detect their presence.

If you're aware of the potential problems you can take steps to help protect your drinking water well and aquifer

Many existing private water wells were installed when there was little reason for concern about protecting the well or the aquifer supplying it. Over the years we have learned that there are relatively simple and inexpensive steps that can be taken to further protect even the safest well from contamination, not to mention those wells which have been in existence for many years.

This **Fact Sheet** is the first in a series of **Fact Sheets** and **Worksheets** that can be used by rural homeowners to protect their drinking water wells from becoming contaminated. Several **Fact Sheets** are accompanied by **Worksheets** that can be completed to evaluate the conditions at your own homestead and are intended only as educational tools to help in assessing your own unique situation. The material emphasizes protection against the

more common types of problems that can develop on rural properties. The **Fact Sheets** are general guidelines which are applicable in most cases, however site specific problems may be present that require further definition than is provided in these reports. Included with each **Fact Sheet** is a list of literature references and/or contacts where you can obtain additional information on water well protection.

Fact Sheets on the following topics are available:

Well Construction. Describes how a well should be built to help prevent contamination from entering the well from the surface or from shallower aquifers of poorer quality.

Contaminant Sources. Explains what types of potential contaminant sources you may have around your property that could possibly contaminate your water supply.

Setback Distances. Describes setback distances for a variety of activities commonly found on rural properties. A setback is a recommended distance that separates a particular activity or substance from your well to provide extra protection to your well. All distances given are minimum recommended distances; greater separation adds additional protection.

Locating New Wells. Too often the location of a well is based upon perceived convenience. This *Fact Sheet* addresses aspects of installing new wells and some of the criteria that should be considered prior to, and during well installation.

Septic Systems. Describes the proper design, care, and maintenance of septic systems.

Well Maintenance. Almost everything requires some amount of maintenance. Water wells are no different. This *Fact Sheet* addresses the periodic upkeep necessary to ensure the proper operation and long life of a well.

Well Plugging. One of the most serious threats to groundwater is the existence of abandoned wells. Abandoned wells act as a direct link between potential sources of contamination at the surface and the aquifer below. All wells that are not in use or are improperly constructed should be properly plugged and sealed off to prevent the introduction of contaminants into the water supply. Proper plugging methods are detailed in this *Fact Sheet*.

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