

Fact Sheet #4
Reducing the Risk of Groundwater Contamination by
Improving Petroleum Product Storage



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1. Storage tank location

The most important aspect of your liquid petroleum storage tank location is how close it is to your drinking water well. New Mexico Water Supply Regulations Section 110:C.2 requires that petroleum storage tanks be located at least 100 feet from a drinking water well. Minimum separation distances regulate only new well installation. Existing wells are required by law only to meet separation requirements in effect at the time of well construction. Make every effort, however, to exceed “old regulations,” and strive to meet current regulations whenever possible.

Even though diesel fuel and fuel oil are more dense than gasoline and move more slowly through the soil, they, too, will eventually reach groundwater.

Every site has unique geologic and hydrologic conditions that can affect groundwater movement. How quickly the petroleum product reaches groundwater will also depend upon local soils. The more porous the soil (sands and gravel, for example), the faster the rate of downward movement to groundwater. You may choose to locate a new tank more than 100 feet away from your well, to provide reasonable assurance that subsurface flow or seepage of contaminated groundwater will not reach your well. If possible, the tank should also be located downslope from the well. Figure 1 illustrates petroleum product seepage into soils.

If you have an above-ground tank, follow existing regulations for underground storage tanks as a guide. To protect against explosion and fire, do not locate tanks (especially above-ground tanks) closer than 25 feet to existing buildings. Previous practices for siting above-ground storage tanks were concerned more with the explosion potential of tanks than the groundwater pollution potential. Contemporary petroleum storage practices also protect groundwater.

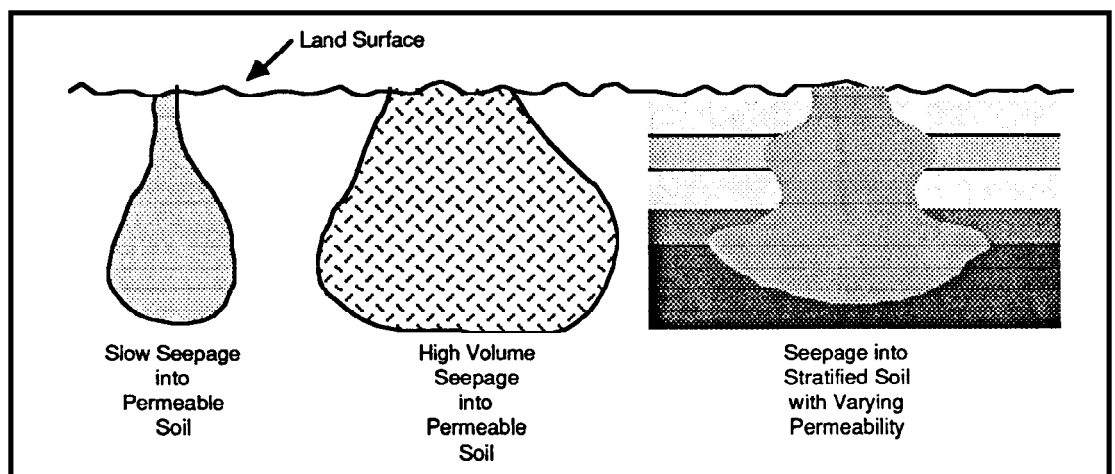


Figure 1: Petroleum product seepage into soils. Source: *Underground Tank Corrective Action Technologies*, EPA/625/6-87-015, January 1987.

*For glossary,
see Worksheet
#4.*

New storage tank location

Along with maintaining adequate distance from your drinking water well, choose a location for a new tank based on the following considerations:

- Soil characteristics.** Highly corrosive clays, wet soils, cinders and acid (low pH) soils can significantly speed up the rate of corrosion of underground metal tanks and piping. Using clean backfill during installation can decrease the negative effects of surrounding soils.
- Soil stability.** Assess the ability of the underlying soil to support both underground and above-ground tanks. For special tank locations, such as hill-sides, be sure to properly anchor and hold tanks in place. Be sure that pipes cannot twist or break if the tank is bumped or disturbed.

Regardless of soil conditions, it is good management to locate above-ground tanks over an impermeable liner made of concrete or one of the newer synthetic fabrics. Build a collection device for spills.

- Current and previous land use.** Sites that contain abandoned pipes and tanks, agricultural drainage tiles or waste materials pose special installation problems. Any metal already in the ground at your chosen site will increase corrosion rates for the new tank.
- Traffic.** Assess traffic patterns around the tank. Determine whether the location of the tank or dispenser will block movement of farm vehicles during refueling or cause special problems if any work needs to be done on the tank. Protect piping from collisions with farm and fuel vehicles.
- Depth to groundwater.** Floodways or areas where the water table is close to the surface are poor locations for storage tanks. Tanks placed in such areas require special installation. To reduce pollution potential, an above-ground tank may be preferable to an underground tank.

2. Tank design and installation

Whenever you install a fuel storage tank, carefully follow the manufacturer's recommended practices for installation. Proper installation is one sure way to minimize the leaking potential of the tank or the piping connected to it. Even scratches in a metal tank caused by careless installation can increase corrosion and tank deterioration.

Farm tanks with more than 1100 gallons capacity must be registered with the New Mexico Environment Department Underground Storage Tank Bureau (NMED-USTB). It is not recommended to reuse an underground tank above ground.

Underground tanks

All new underground petroleum storage tanks and related piping must be constructed of non-metallic materials such as fiberglass, or have corrosion protection. Methods of corrosion protection include exterior coating, interior liners and "sacrificial anodes."

A sacrificial anode is a special material connected to the tank with a greater tendency to corrode than the tank material. The anode will typically protect the tank for up to 30 years. Interior liners are made of noncorrosive synthetic materials and can also be effective in protecting metal tanks.

New Mexico regulations require that all new farm underground tanks have spill and overflow protection. Spill protection typically consists of a catch basin for collecting spills when the tank is filled. Overflow protection is a warning or prevention of an overflow such as an automatic shutoff or buzzer. Spill and overflow protection are important; they can prevent a number of small releases over a long period of time from polluting the groundwater.

Above-ground tanks

For above-ground tank installation attempt to reduce the potential for both pollution and fire. Good management practices include 1) enclosing the tank within a secure 6-foot fence or well-ventilated building constructed of noncombustible material; and 2) constructing a fire wall between the fuel dispensing area and the tank.

To decrease pollution potential, place farm tanks within a secondary containment structure consisting of a dike and a pad. All piping should be above ground within the dike or may go over the dike wall, but it must be placed below ground within 10 feet of the dike wall. Above-ground piping should be made of steel and coated to prohibit corrosion. Any below-ground piping may be either steel or fiberglass, but steel must be coated and cathodically protected.

3. Monitoring

Regulations for new underground farm tanks require that all tanks, greater than 1100 gallons capacity, have a method of detecting leaks. Test procedures will depend upon the age and condition of the tank. Contact NMED for requirements.

Since cleanup of gasoline leaks is always costly and often not totally effective, it is important to constantly monitor underground tanks containing petroleum products.

If you already have a petroleum storage tank on your farm, be especially aware of the age of your tank as well as the need to establish a leak-detection program. Figure 2 shows how groundwater can be contaminated by underground tanks.

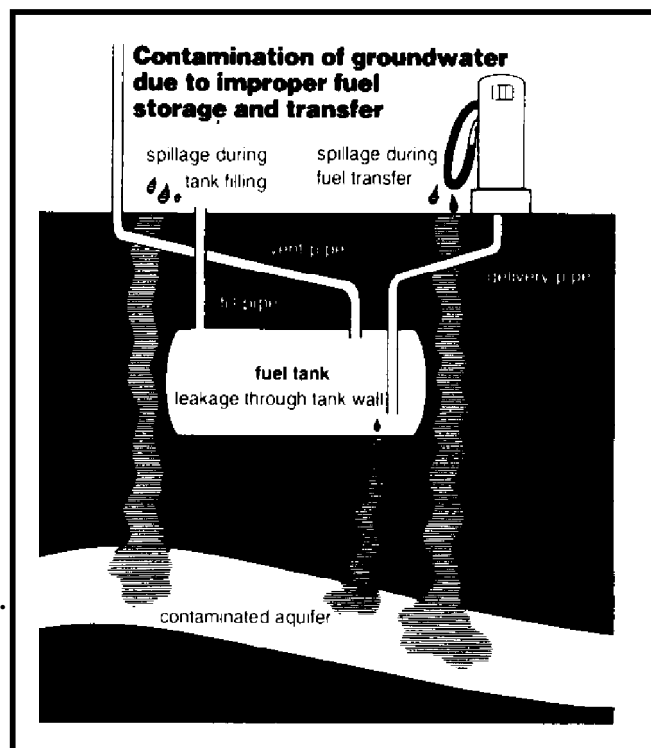


Figure 2: Contamination of groundwater due to improper fuel storage and transfer.
Source: Handling and Underground Storage of Fuels, Cooperative Extension Service, Michigan State University, Extension Publication WQ01. Reprinted February 1986.

Since most tanks used on farmsteads are bare steel, tank corrosion or piping problems will cause leaks sooner or later. If your tank is more than 20 years old, or if you don't know its age, make a special effort immediately to determine whether leaks exist.

You can test tank integrity by such methods as precision testing/tightness testing and volumetric analysis. State regulations allow some other testing methods. You can request a list of approved tank-testing methods and suppliers' phone numbers from the NMED-USTB at (505) 827-0216.

Even when a tank has been tested and proven tight, existing regulations and good practice require that you have a method for regularly detecting leaks.

You should install such internal or external monitoring methods as ground-water monitoring wells, vapor monitoring, automatic tank gauging or other approved methods.

Measuring tank inventories is an inexpensive and easy way to help detect leaks. Leakage is apparent when there is any decrease in level over time without any withdrawal of fuel or an increase in water in the tank. While inventory measurement will not detect very small leaks, it will at least provide a warning that further investigation may be necessary.

If you use a measuring stick to measure tank liquid level, be sure that the stick does not puncture or damage the bottom of the tank.

The closer the tank is to the farmstead's drinking water well, the more important it is to ensure that an adequate leak-detection system is in place.

Leaks and spills

If you find a leak or spill from any tank—whether it be above or below ground, or even a vehicle-mounted tank—notify the Remedial Action Staff at (505)827-0188. Take whatever actions are necessary to remedy the problem, according to recommendations you receive when you report the spill or leak.

The New Mexico Environment Department administers the federal Leaking Underground Storage Tank Trust Fund, which may be used in cleaning up a problem for federally regulated tanks or home heating fuel tanks. For more information about the fund, call NMED-USTB at (505) 827-0079.

4. Tank closure

Tanks no longer in use can cause problems for owners and operators many years later. They will continue to corrode and, if they still contain gas or oil, will likely contaminate groundwater.

Try to determine the location of any unused tanks on your property. Also, try to find out whether the tanks still hold product or have holes. These tanks must be pulled from the ground and disposed of in a landfill or at a scrap dealer.

State law does not require licensed contractors to pull a tank. However, precautions must be taken to prevent explosion or other problems. Deaths have occurred due to improper closure. Only experienced persons should attempt tank closure.

If you are concerned that your unused tank has been leaking, consult an environmental engineer or NMED-USTB investigator to determine if further investigation is warranted. If there is groundwater pollution in your area, your neighbors will be sure to suspect the tank as its cause. NMED-USTB also has regulatory authority to investigate potential pollution situations and recover costs from responsible parties.

You should document steps you take to legally close your tank—including that you notify the NMED-USTB that the tank has been closed—so that you are protected from legal action in the event of groundwater problems.