

OKLAHOMA
Farm & Ranch*A*Syst

Fact Sheet 4

Reducing the Risk of Ground Water Contamination by Improving Petroleum Product Storage

Storage Tank System Location

Leaks and spillage from petroleum fuel tanks and associated pipes are a serious threat to ground water (see Figure 1). Minimum separation distances regulate only new well installations. When drilling a new well or siting a new tank, make every effort to meet or exceed current regulations whenever possible.

Diesel fuel and fuel oil move more slowly through the soil than gasoline. However, these petroleum products will also reach ground water. Liquefied petroleum (LP) gas is not a threat to ground water, since leaks vaporize quickly as they leave the tank.

Every site has unique geologic and hydrologic conditions that can affect ground water movement. How quickly the petroleum product reaches ground water will also depend upon local soils. The more porous the soil (sands and gravels, for example), the faster the rate of downward movement of the petroleum product. Once petroleum reaches ground water, it floats on the top of the aquifer and spreads with the ground water. In time, it can move long distances horizontally. What appears to be a minor problem at the ground surface may be a much more widespread problem below (see Figure 2, next page).

Petroleum storage tanks should be located at least 300 feet from a drinking

water well. This distance should provide reasonable assurance that leakage will not reach your well. If possible, the tank should also be located downslope from the well. If you have an above-ground tank, follow regulations for underground storage tanks and consider the hazard of explosion and fire. Do not locate a tank closer than 50 feet from the nearest building.

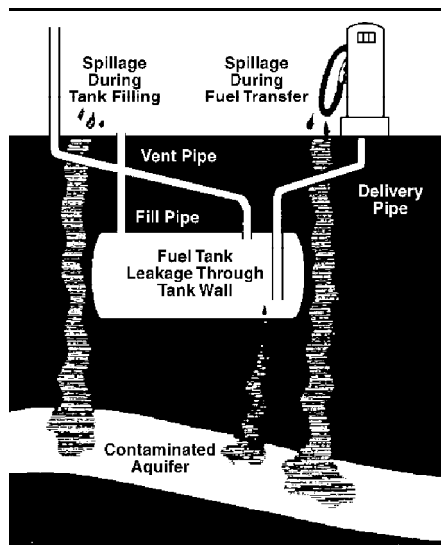


Figure 1. Contamination of ground water due to improper fuel storage and transfer. (Source: *Handling and Underground Storage of Fuels*, Cooperative Extension Service, Michigan State University, Extension Publication WQO1.)

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 acidic (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 rate of tank corrosion.
- * **Soil Stability.** Assess the ability of the underlying soil to support both underground and above-ground tanks. For special tank locations such as hillsides, use anchors to hold tanks in place. Be sure that pipes cannot twist or break if the tank is bumped or disturbed.
- * **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 the site can increase the rate of corrosion 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. Underground tanks and piping should be protected from heavy surface traffic, which can cause soil shifting that might damage piping. Protect above-ground piping from collisions with farm and fuel vehicles.

- * **Depth to Ground Water.** Flood plains or areas where the water table is close to the surface are poor locations that require special installation. In areas of shallow ground water, a properly installed above-ground tank may be preferable to an underground tank.

Tank Design and Installation

Whenever you install a fuel storage tank system, carefully follow the manufacturer's recommended practices for installation. Oklahoma requires that all agricultural fuel storage tanks larger than 1,100 gallons be installed by a certified tank installer. The Oklahoma Corporation Commission (OCC) can provide a listing of certified tank installers. (Call the OCC at 405-521-3107.)

Underground Tanks

All approved new underground petroleum storage tanks and related piping must have corrosion protection or be constructed of approved non-metallic materials, such as fiberglass-reinforced plastic. Methods of corrosion protection include the use of coatings, interior liners, and "sacrificial anodes." Proper installation minimizes the chance of leaking. Even scratches in the coating of a metal tank caused by careless installation can speed the onset of corrosion and tank deterioration. Interior liners are made of noncorrosive synthetic materials. A sacrificial anode is a special material connected to the tank which has a greater tendency to corrode than the tank material. The anode may protect the tank for 10 to 30 years.

It is advisable that underground tanks also have spill and overfill protection. Spill protection typically consists of a catch basin for collecting spills when the

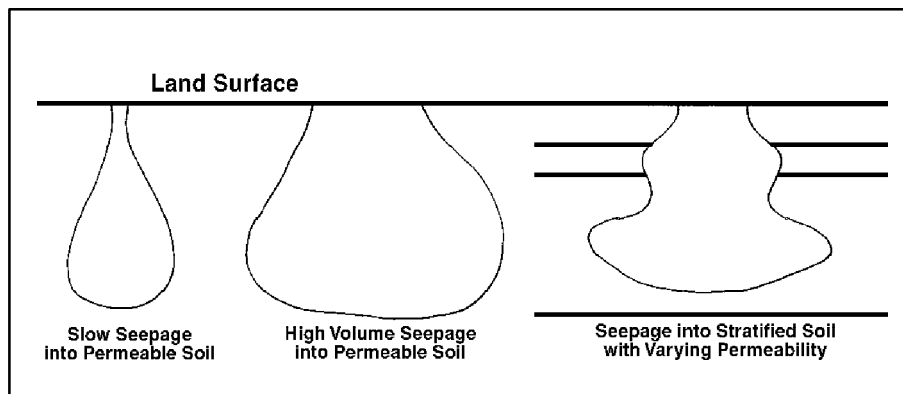


Figure 2. Petroleum product seepage into soils. (Source: *Underground Tank Corrective Action Technologies*, EPA/625/6-87-015, January 1987.)

tank is filled. Overfill protection is a warning or prevention system, such as an alarm or an automatic shutoff. Spill and overfill protection are important. They will prevent a number of small releases over a long period of time that could pollute the ground water.

Above-ground Tanks

Above-ground tank installations must address the problems of both pollution and fire. Recommendations include:

- * Installing the tank over an impermeable liner made of concrete or one of the newer synthetic fabrics.

Piping Failures

EPA studies show that most leaks result from piping failures. Piping is smaller and less sturdy than tanks. Piping is assembled in the field with numerous connections and usually installed near the soil surface. As a result, piping suffers much more than tanks from the effects of installation mistakes, excess surface loads, the stress of soil movement, and corrosion. Using a skilled installer is even more critical to the proper installation of piping. It is important to remember that the regulations apply to the entire fuel tank system.

- * Enclosing the tank within a secure six-foot fence or well-ventilated building (for the sole purpose of fuel storage) constructed of noncombustible materials.
- * Constructing a fire wall between the fuel-dispensing area and the tank.
- * Installing tanks with a 1,100-gallon capacity or greater by a certified tank installer.
- * Building a collection device for spills and leaks by placing farm tanks within a secondary containment structure consisting of a dike and a pad.
- * Ensuring that all piping within the dike is above ground. (If piping must extend outside the diked area, it should be placed below ground before it extends more than 10 feet beyond the dike wall.)
- * Using above-ground piping made of steel and coated to prohibit corrosion.
- * Using underground piping made of steel (coated and cathodically protected) or fiberglass-reinforced plastic.

Monitoring

All new agricultural underground tank systems (1,100-gallon capacity or greater) must have a method of detecting leaks. This is also advisable for smaller tank systems. Test tanks periodically for leaks and measure the tank contents

monthly to help detect leaks before major problems develop. Check piping and joints periodically for signs of leakage.

Cleanup of petroleum products such as gasoline is always costly and often not totally effective. If you already have a petroleum storage tank system on your farm, be especially aware of the age of your tank, as well as the need to establish a leak-detection program. As shown in Figure 2, leakage and spillage of petroleum products may cause much more widespread pollution of ground water than they appear to at the ground surface.

Most tanks used on farmsteads are bare steel; therefore, tank corrosion or piping problems will cause leaks sooner or later. If your tank is more than 10 years old or if you don't know its age, make an immediate effort to determine whether leaks exist.

You can test tank integrity by precision testing/tightness testing or volumetric analysis. Federal and state regulations prohibit some other testing methods. Air pressure testing, for example, is prohibited in a tank that has ever contained a product. You can request assistance for appropriate testing methods from the Oklahoma Corporation Commission at 405-521-3107.

Existing regulations and good practice require that you have a method for regular inspection and testing. These include:

- * Installing monitoring wells or internal monitoring methods such as automatic tank gauging, vapor monitoring, or other approved methods.
- * Measuring tank inventories to detect leaks. Leakage is identified by any unaccountable decrease in tank contents. Inventory measurement will not detect very small leaks.

Caution: A tank measuring stick must be used carefully because continued use may puncture or damage the bottom

of the tank over time. Tank measuring sticks should never be metallic.

The closer the tank is to the ranch or farmstead's drinking water well, the more important it is that you monitor for leaks.

Leaks and Spills—What to Do

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 24-hour hotline of the Oklahoma Department of Environmental Quality at 800-522-0206. Take whatever actions necessary to remedy the problem, according to recommendations you receive when you report the spill or leak.

The Oklahoma Corporation Commission administers the Petroleum Storage Tank Release Indemnity Program (The Indemnity Fund). The Indemnity Fund can reimburse tank owners for eligible costs incurred in cleaning up a leak from state regulated underground and above-ground storage tanks. For more information about the fund, call the OCC at 405-521-4683. Residential and farm fuel storage tanks smaller than 1,100-gallon capacity are not state regulated. Therefore, they are not eligible for this assistance.

Tank Closure

Tanks no longer in use (out of service for over 12 months) can cause problems for owners and operators many years later. Unused tanks will continue to corrode and, if they still contain gasoline or oil, they will likely contaminate ground water. Federal and state regulations require that all tanks taken out of service permanently must be removed from the ground or filled with an inert solid material.

The law requires that only certified installers remove a tank larger than 1,100 gallons. Before removing a tank, notify the fire department well in advance.

Adequate notification of tank closure will ensure that precautions are taken to prevent an explosion or other problems. Improper removal of fuel storage tanks can be dangerous.

If you are concerned that your unused tank has been leaking, consult an environmental engineer or OCC investigator to determine if further investigation is warranted. The OCC also has regulatory authority to investigate pollution problems and recover costs from responsible parties. For liability protection, document the steps you take in closing an unused tank.

Many banks and other lending institutions make an environmental analysis of farm property before granting loans or mortgages. If problems are found, funding may be denied or the value of your property substantially reduced. Make sure fuel storage and other potential sources of environmental pollution are properly handled to protect future property value.

Contacts and References

Where to call about...

Tank Registration, Reporting Closure, and Changes in Tank Ownership—

Contact the Oklahoma Corporation Commission (OCC), Fuel Division - Storage Tanks, Jim Thorpe Bldg., 2101 Lincoln Blvd., Oklahoma City, OK 73105, 405-521-3107.

EPA Regulations—

EPA Region 6, Petroleum Storage Tanks (Dallas, Texas), 214-655-6440.

Petroleum Product Storage, Tank Testing Methods, and Suppliers—

Contact the Oklahoma Corporation Commission (OCC), Fuel Division - Storage Tanks, Jim Thorpe Bldg., 2101 Lincoln Blvd., Oklahoma City, OK 73105, 405-521-3107.

Petroleum Product Spills—

Oklahoma Corporation Commission (OCC), Fuel Division - Storage Tanks, Jim Thorpe Bldg., 2101 Lincoln Blvd., Oklahoma City, OK 73105, 405-521-3107.

Oklahoma Department of Environment Quality (DEQ), 800-522-0206 (24 hours a day).

Financial Assistance—

For more information about the Petroleum Storage Tank Release Cleanup Indemnity Fund, contact the Oklahoma Corporation Commission (OCC), Fuel Division - Insurance/Indemnity Fund, Jim Thorpe Bldg., 2101 Lincoln Blvd., Oklahoma City, OK 73105, 405-521-4683.

Health Effects of Gasoline-Contaminated Ground Water—

Oklahoma Department of Environment Quality (DEQ), 405-271-4468.

Oklahoma Department of Health (ODH), 405-271-5205. *

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