6. What types of fuel storage systems are available?

The objectives of fuel storage are to maintain fuel quality and minimize losses in a safe manner. There are several on-farm storage options classified as underground and above ground. Above ground systems include on-ground and/or overhead tanks.

Underground tanks are completely buried with only the pumps, vents and fill connections visible. Vertical, on-ground tanks are usually cylindrical in shape and have their bottoms sitting directly on the ground. These are not as common as a horizontal tank is on the farm. Horizontal, on-ground tanks are cradled close to the ground in a heavy steel frame. An on-ground tank must be equipped with a pump for fuelling vehicles and farm machinery. The last above ground option is overhead tanks. They are supported above the ground on stands and the fuel is gravity fed.

Table 3: Comparison of above ground storage tanks (AST's) and underground storage tanks (UST's)

TANK SYSTEM	ADVANTAGES	DISAVANTAGES
ASTs	System can be visually monitored for leaks or corrosion, allowing for an effective response	Increased fire hazard
	Repairs are quick and less expensive	May require vapour recovery system
	Minimal excavation required	Increased risk of vandalism or accidental vehicular collision
	Installation slightly less expensive	Can be aesthetically undesirable
		Takes up additional space
		Tanks exposed to adverse weather conditions; additional wear may result
		Tank exposed to pressure and temperature fluctuations
USTs	Do not require any surface space	Repairs are more difficult and expensive
	Less of an aesthetic concern	Releases and corrosion can go undetected
	Tank sheltered from adverse weather conditions	Extensive excavation required for installation
	Reduced fire hazard	Greater corrosion risk for steel tanks & piping
	May not be required to control the release of volatile organic vapours	Underground piping subject to breakage with freeze and thaw stresses

Storage Tank Management Systems, Public Works and Government Services Canada, adapted

Above ground storage tanks

Traditionally, many farms used the overhead, gravity fed type systems that would not comply with the AFC. Because of the large expense often associated with new on-ground tank systems (the most recommended), many producers are looking for ways to upgrade their existing systems. This publication will also provide some suggestions and ideas for farmers looking to decrease their risk associated with these tanks. However, if a producer chooses to use their existing tanks with some upgrades, they may still not meet all of the AFC requirements.

Underground storage tanks

Under the AFC new underground fuel tanks must be installed by an approved contractor. While farmers are exempt from the AFC, there are compelling reasons why an approved contractor should be hired. Some protection is provided by the contractor's insurance if a leak or malfunction

can be traced to the installation. If a farmer installs his own tanks, his risk is extended to include both the owner's and the installer's liabilities. The Petroleum Tank Management Association of Alberta (PTMAA) has a list of approved contractors. See the *For More Information* section in the Appendix for contact details.

According to the AFC, all new underground construction must include:

- Cathodic protection on steel tanks and piping
- Tank leak detection (monitoring wells or acceptable means of monitoring of secondary containment, ATG, etc.)
- Line leak detection (single, vertical check valve on suction, mechanical or electronic leak detectors on turbine systems, sump monitoring)
- Under-dispenser sumps
- Spill containment on fill pipes (liquid-tight fill buckets)
- Over-fill prevention devices (95% maximum tank capacity)
    - Liquid-tight fill couplings (cam-lock connections)
- New, underground Class A[4] construction must also include secondary containment on tanks and piping. Class B systems can be installed with single wall tanks and piping

Overview of Regulations, PTMAA

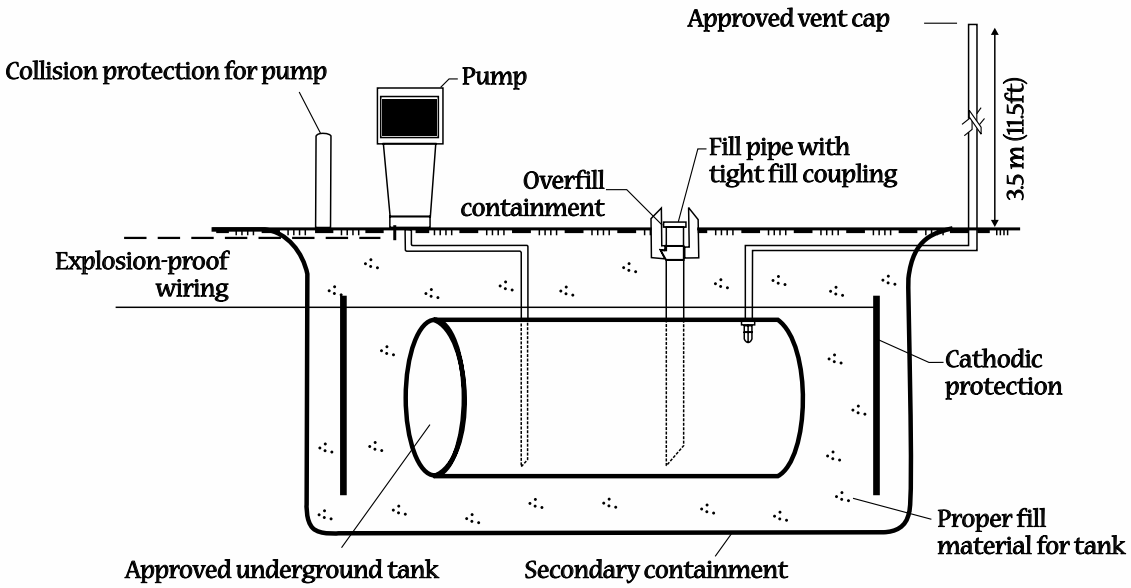

Figure 9: Underground storage tank[5]

[4]Class A sites include underground fuel tanks that are within 500 metres (1,640 feet) of a water well or 200 metres (650 feet) from a surface water source. All other underground fuel tanks are considered Class B sites.

[5]This figure is for illustration purposes only. Although most major components are shown, some installations will require additional devices/equipment in order to be in compliance with the Alberta Fire Code.