

GUIDELINES FOR SAFE
**ABOVE-GROUND
FUEL STORAGE**
ON FARMS



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Introduction

The purpose of this guideline is to assist farmers and people involved with fuel delivery to evaluate farm fuel storage systems to ensure the hazards associated with that storage are safely and effectively managed.

The guideline relates to above-ground (overhead) fuel storage systems, and is based on the checklist contained in the OSH farming bulletin No 12 (June 2000) *Safe Farm Fuel Storage*. (The checklist is reproduced on p.8 of this guideline.) However, the principles outlined in this guideline can relate to all forms of fuel storage systems on farms.

Review Period

This guideline shall be reviewed by OSH, the oil companies, and the agricultural industry organisations by 1 January 2003.

Implementation of the Safe Farm Fuel Storage Guidelines

Farmers and fuel suppliers both have legal obligations under the Health and Safety in Employment Act 1992 in relation to the delivery and storage of fuel on farms. They also have other responsibilities specified in the Resource Management Act and the Hazardous Substances and New Organisms (HSNO) Act 1996.



Farmers and fuel suppliers both have legal obligations in relation to the delivery and storage of fuel on farms.

The *Safe Farm Fuel Storage* bulletin provided a checklist to assist farmers to determine if their fuel storage facility met the required standards. This guideline provides farmers and people involved with delivery of fuels to farms with additional information on the standards for fuel storage facilities.

Farmers shall use the bulletin checklist and supporting guideline prior to ordering a fuel delivery, to ensure that their fuel storage facility is up to the required standard to enable a fuel delivery to proceed.

The fuel supply company will carry out a check of the fuel storage facility using this guideline to determine the suitability of the tank for filling. The tank should be assessed in terms of:

- Structural safety (of the tank, support structure, foundation, ladders and fittings);
- Hazards associated with flammable liquids (especially regarding isolation distances);
- Safe access to the fuel storage facility.

This guideline provides additional information for delivery

drivers when determining if a fuel storage facility is of an appropriate standard for the delivery to proceed.

Where fuel has been delivered to fuel storage facilities that do not meet the minimum standards required for safe storage as outlined in the farming bulletin and this supporting guideline, the nearest regional office of OSH or territorial authority District Hazardous Substances Officer shall be notified.

Procedure for Evaluation of Farm Fuel Storage Systems

- 1 The farmer will assess the tank using the Safe Farm Fuel Storage Checklist, *before ordering fuel delivery*, and repair any faults found.
- 2 The fuel supplier will assess the tank against the requirements in the checklist (for structural safety, isolation distances, and access) prior to delivering fuel:
 - (a) The tank meets the requirements: ➔ Fuel is delivered.
 - or
 - (b) The tank fails to meet the requirements: ➔ No fuel delivery is made.
- 3 The fuel supply company will advise the farmer in writing of the reasons for the tank failing to meet the required standards and requesting the problems be fixed.
- 4 The farmer will either:
 - (a) Repair the faults: ➔ Fuel will be delivered.
 - or
 - (b) Not repair the faults: ➔ No fuel delivery is made.
- 5 OSH or the territorial authority District Hazardous Substances Officer shall be advised if the unsafe tank is filled by another supplier.

Tripod Supporting Structures

OSH approval for the manufacture of tripod (three-legged) stands on fuel tanks was cancelled in 1996, with the intention that the use of existing tripod tanks would be phased out when they were assessed as unsafe. Use of tripod tanks has continued and many are now reaching the end of their safe working life.

Any tank with a tripod supporting structure that has been manufactured since 1996 will not have been constructed to an approved OSH standard, and therefore will not meet the standards of this guideline.

In line with the removal of OSH approval in 1996, no new tripod tank stands shall be installed, and the use of current tripod stands should be phased out.

Farmers using tanks with a tripod supporting structure should be aware of the possible additional hazards associated with their use, as described in the following guidelines. Because



The use of tripod stands is not recommended.

of the light construction of the tripod supporting structures, the hazards are made worst when the stands have not been well maintained.

Because of the difficulties resulting from poor maintenance and their inherent design characteristics, the use of tripod tank stands is not recommended.

The risks when using tripod stands can be reduced provided that the standards specified in this guideline are adhered to, especially with regard to:

- Ensuring that the tripod stand is firmly attached both to the tank and to the ground;
- Ensuring that all bracing is present, and that the legs and bracing are straight; and
- Ensuring that effective maintenance is carried out.

If tripod tank stands cannot be maintained to the standard outlined in this guideline, they shall not be used and shall be condemned.

Guidelines on the Use of Tripod (Three-Legged) Tank Stands

- No new three-legged tank stands shall be installed, and the use of current tripod stands should be phased out.
- The risks when using tripod stands can be reduced provided that the standards specified in this guideline are adhered to, especially with regard to:
 - ensuring that the tripod stand is firmly attached both to the tank and to the ground;
 - ensuring all bracing is present and attached, and that the legs and bracing are straight and undamaged; and
 - ensuring effective maintenance is carried out.
- The use of current three-legged tank stands is not recommended. If three-legged tank stands cannot be maintained to the standard outlined in this guideline, they shall not be utilised, and shall be condemned.
- The ongoing use of tripod supporting structures will be assessed at the first review of this guideline by 1 January 2003.

Safe Farm Fuel Storage Checklist (Reproduced from OSH farming bulletin No 12, June 2000)

Structural Safety	Yes	No	Comments
Q Is the tank supporting structure sound and stable? (Page 8) <i>Consider corrosion, buckling, or bent legs or bracing.</i>	<input type="radio"/>	<input type="radio"/>	
Q Is the tank support on a solid, level foundation? (Page 12) <i>Consider stability when ladder is used.</i>	<input type="radio"/>	<input type="radio"/>	
Q Are fixed ladders in sound condition and secure? (Page 13) <i>Consider corrosion, bent or damaged rungs.</i>	<input type="radio"/>	<input type="radio"/>	
Q Is the storage tank of sound construction? (Page 14) <i>Consider corrosion, leaks, seals.</i>	<input type="radio"/>	<input type="radio"/>	
Q Are fittings, pumps and hoses free of leaks and undamaged? (Page 15)	<input type="radio"/>	<input type="radio"/>	
Hazards Associated With Flammable Liquids			
Q Are ignition sources 15 metres away from fuel storage? (Page 17) <i>Ignition sources include naked flame, smoking, electrical appliances, running engines, sparks from tools, static electricity.</i>	<input type="radio"/>	<input type="radio"/>	
Q Are chemicals and fertilisers stored away from fuel? (Page 17)	<input type="radio"/>	<input type="radio"/>	
Access to Fuel Storage Facility			
Q Is there safe access to fuel the fuel storage facility? (Page 18) <i>Consider: housekeeping, tripping hazards, vegetation, ground surface, other machinery, weight and size of tanker in respect of road access, bridges, overhead wires, work area.</i>	<input type="radio"/>	<input type="radio"/>	
Health Risks			
Q Are handling methods designed to avoid inhalation or absorption of fuel? (Page 20)	<input type="radio"/>	<input type="radio"/>	
Emergency Procedures			
Q Have emergency procedures been established and is equipment available to deal with an emergency? (Page 20)	<input type="radio"/>	<input type="radio"/>	
Training and Supervision			
Q Is there adequate knowledge of the hazards that exist, precautions to be taken, and emergency procedures? (Page 21)	<input type="radio"/>	<input type="radio"/>	
Exemption From Licence For Farm Fuel Storage			
Q Is your farm 4 hectares or larger?	<input type="radio"/>	<input type="radio"/>	
Q Is storage within quantity limits?	<input type="radio"/>	<input type="radio"/>	
Q Are storage facilities 20 metres from protected work?	<input type="radio"/>	<input type="radio"/>	
Q Is storage compounded or located so spillage does not endanger buildings or environment?	<input type="radio"/>	<input type="radio"/>	
Q Do you need a Dangerous Goods Storage Licence? (Page 21)	<input type="radio"/>	<input type="radio"/>	

Hazards Associated with Above-Ground Farm Fuel Storage

When farm tanks are mounted on stands so as to make use of gravity to feed the fuel into the farm machines, hazards are sometimes created that require managing (e.g. when climbing the structures to fill the tanks, or through collapse of the fuel tank support structures). The hazards associated with overhead tanks can be summarised as those associated with:

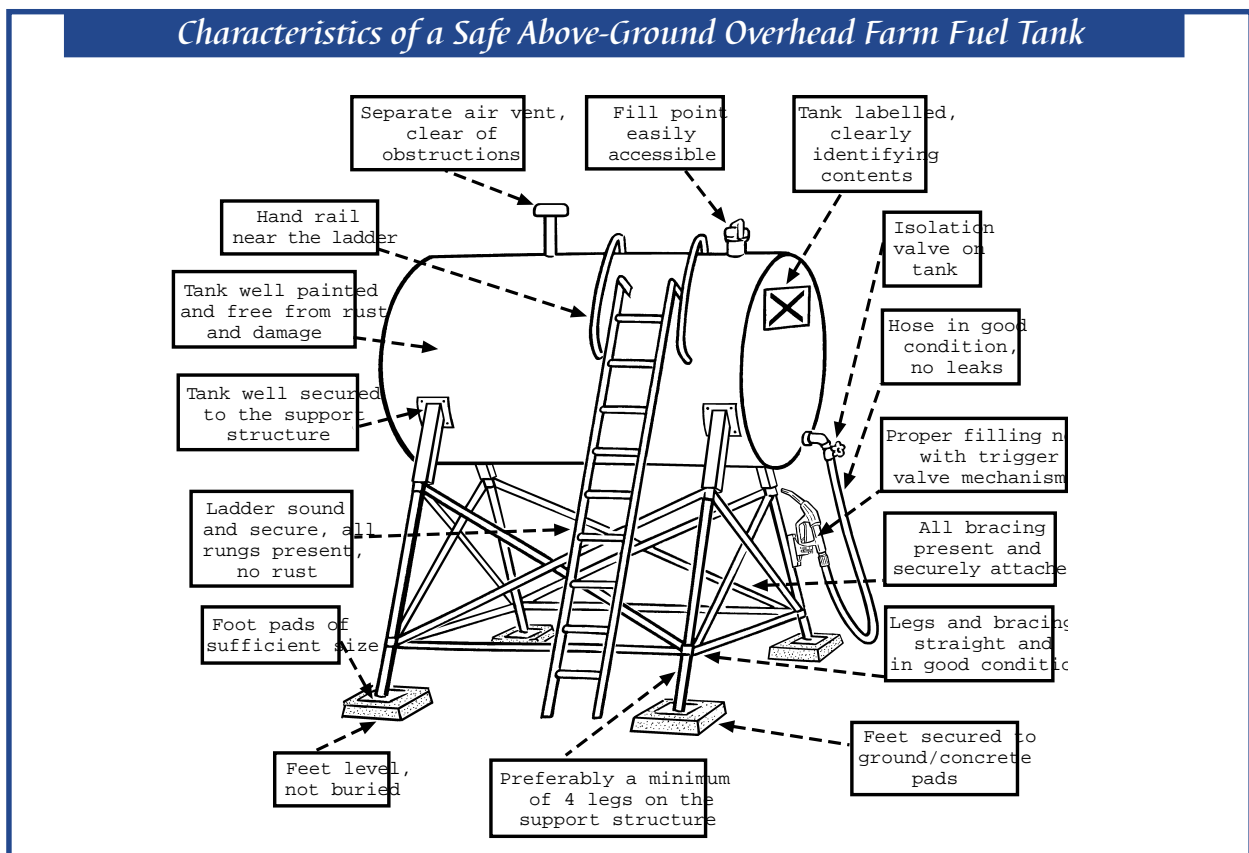
- the supporting structure of the tank;
- the foundations for the tank support;
- the ladder;
- the tank;
- the hose and fittings;
- access to the tank; and
- location of the tank.

Structural Safety

Tank Supporting Structure

The bulletin checklist asks:

- Q** Is the tank supporting structure sound and stable? Consider corrosion, bucking or bent legs or bracing.



There are a number of reasons why a tank and its support structure may be unstable:

- Basic design problems of the support structure;
- Parts of the support structure missing (e.g. lack of spreaders);
- Poor attachment between the tank and the legs, sometimes due to joints breaking;
- Lack of maintenance, often associated with serious rusting;
- Legs not being tied to the ground (with overhead tanks, each leg of the support structure shall be secured to the ground).

Effect of Rust on the Soundness of the Supporting Structure

Rust (corrosion) can have a major affect on the strength of both the supporting structure and the tank.



The key to preventing damage through rust is maintaining an effective maintenance regime. Remove rust as soon as it appears by use of a wire brush, and repaint using a rust-inhibiting undercoat and top coat.

Major locations on the supporting structure where rust may be a concern are:

- at the connections, bolts, welded points and main contact support to the tank itself;
- at all welded joints, especially between the ladder rungs and the legs;
- on welded sleeves used on some models to fit legs or spreaders;
- on the joint between feet and legs, especially if the feet have become buried.

Rust can affect the strength of both the supporting structure and the tank. Remove rust as soon as it appears.

Guidelines for Rust on the Supporting Structure

- While minor rust is acceptable, any rust will have an effect on the strength of the legs, and of the strength of attachments.
- Rust on the welded joints of ladder rungs is not allowed and shall be removed, and the soundness of the welds checked.
- Any other rust should only be minor, and not affect the strength of the supporting structure.
- Remove rust as soon as it appears by use of a wire brush, and repaint using a rust-inhibiting undercoat and top coat. This also applies to rust on the tank.

Attachment of Fuel Tank Support to the Structure

The tank shall be soundly attached to the support structure so that there is no danger of the tank falling off the stand. Where the legs of the support structure are slotted into a sleeve on the tank, the legs should be pinned or bolted into the sleeve so that there is no danger of the legs pulling out from the stand support.

Guideline for Attachment of the Tank to the Support Structure

- The fuel tank shall be securely attached (either pinned or bolted) to the supporting structure.



Soundness of the Bracing of the Supporting Structure

The structural integrity of the support structure is maintained through bracing. Examples of possible bracing are:

- diagonal leg bracing to prevent racking or twisting;
- horizontal leg bracing designed to prevent the spreading of the legs (spreaders). This bracing is usually working under tension.
- support bracing between the tank and the support structure.

It is important that all legs are adequately braced to prevent distortion or collapse of the support structure.

It is important that all legs are adequately braced.

Guidelines for Bracing on the Support Structure

- All leg bracing fitted to the support structure shall be present, and attached.
- Only slight bending of the leg bracing is acceptable.
- Physical damage of the legs or leg bracing is not acceptable.
- The attachment between the bracing and the legs shall be sound.
- Preferably bracing should be bolted to the legs. If using the rod and sleeve system, the rods should be pinned at the sleeve.

Straightness of the Supporting Structure

The legs and bracing of farm fuel tank stands are often bent, usually as a result of being hit by machinery. Any bending of the support structure will decrease its strength and the ability to support the tank, especially when the tank is full. Distortion of the supporting structure can be a special hazard during the refilling operation because of the different stresses that are being exerted on the stand. A bend in either a leg or in the bracing may indicate unequal loading on the legs.

Guidelines for Straightness of the Supporting Structure

- The legs on the support stand shall be straight — no bending or buckling of the legs shall be allowed. If legs are damaged, they should be repaired or replaced.
- Only slight bending of the bracing is acceptable. This is especially the case where the bracing is acting under compression. Bracing that has been excessively bent should be replaced.

Modifications to Fuel Tank Supporting Structures

Modifications to the tank support structure, such as mounting the legs on blocks or putting tanks on platforms so as to raise the head of the tank, can result in decreased stability of the support structure and increase the hazard of the tank tipping over.

Guidelines for Modifications to Fuel Tank Support Structures

- Any modification to the fuel tank support structure shall not decrease the stability of the fuel tank.
- Where tank support structures are modified, they shall meet all the attachment and structural requirements as set out in these guidelines.
- Any modifications to the height of the tank shall comply with the HSE Regulations regarding work above 3 metres.

Guidelines for Stability of the Supporting Structure

- The tank should not sway when a person applies a moderate force to one leg of the supporting framework at approximately shoulder height.
- If the tank moves more than slightly (50 – 100 mm) this may indicate the tank is unstable or the support structure not adequately braced.

Foundation for the Tank Support

The bulletin checklist asks:

- Q** Is the tank support on a solid, level foundation? Consider stability when a ladder is used: “Levelling wedges” have been known to fail.

The Dangerous Goods Regulations require that all tanks be on suitable foundations to prevent subsidence. This is best achieved by mounting the tank legs on a concrete pad, or on concrete footings (the recommended minimum size for footings is 600mm x 600mm x 300mm). Alternatively, the tank stand should be on a solid foundation (such as compacted ground) that is well drained and will not become boggy when wet.

The legs shall have sufficient size pads or feet to distribute the weight of a full tank of product without undue settlement of the ground.

It is important that the feet of the support structure are attached to the foundation or the ground so that the structure will not tip when being climbed. This can be achieved through the use of anchor bolts on the concrete footing, or where concrete is not being used, by pinning the feet to the ground or tying them to a post or a waratah stake. Care should be taken if using a stake to ensure additional hazards are not set up, e.g. the risk of someone falling on the stake.

The leg feet shall be level, and on top of the ground or concrete. ***The feet shall not be buried – this can lead to rapid corrosion, and the condition of the feet cannot be checked.***



The feet of a tank should not be buried as this can lead to rapid corrosion, and their condition cannot be checked.



Preventing subsidence is best achieved by mounting the tank legs on a concrete pad.

Guidelines for Tank Footing

- The tank shall be sited on a solid level site, either on compacted material or on concrete, where there is no danger of the tank overturning because of subsidence of the ground, or because the support legs are uneven.
- All feet shall be pinned or attached on top of the foundation or ground — they shall not be buried.
- The legs shall have sufficient size pads or feet to distribute the weight of a full tank of product without undue settlement of the ground.
- All feet shall be level.

Ladders

The bulletin checklist asks:

- Q** Are fixed ladders in sound condition and secure? Consider corroded, bent or damaged rungs.

Access to overhead tanks is usually through the use of a ladder, either one attached to the structure or part of the support stand (a fixed ladder), or a freestanding (portable) ladder.



Fixed ladders shall be safe, robust and secure.

Fixed Ladders

Fixed ladders shall be safe, robust and secure. Special care shall be taken to ensure that all rungs of the ladder are present, and that the ladder rungs are free of damage or corrosion. Rust on the welded joints between the ladder rungs and the support structure shall not be allowed and must be removed. Where the ladder is up a leg of the support structure, the ladder shall be located directly below the handholds on the tank.

Freestanding (Portable) Ladders

If using a freestanding ladder, its positioning must be free from any obstructions and it must be set on a stable footing. Do not sit the footing on loose wooden chocks — they can easily slip and cause the ladder to fall. When using a freestanding ladder against a three-legged tank, it is important, to avoid tipping of the tank, that the ladder is positioned so that it is directly opposite a supporting leg.

Guidelines for the Use of Ladders on Fuel Tanks

- Any ladder used to climb the fuel tank shall be safe and robust.
- On **fixed ladders**, special care shall be taken to ensure that:
 - all rungs of the ladder are present; and
 - the ladder rungs are free of damage or corrosion; and
 - the fixed ladder is securely attached; and
 - the ladder is located directly below the handholds on the tank.
- When using a **portable (free standing) ladder**:
 - position the ladder so that it is clear of obstructions;
 - position the ladder on a stable footing;
 - if positioning a ladder against a tripod structure, ensure the ladder is directly opposite a supporting leg.

The Storage Tank

The bulletin checklist asks:

Q Is the storage tank of sound construction? Consider corrosion, leaks, seals.

Tanks shall be of sound construction. This means:

- There is no serious corrosion that could materially affect the tank's integrity.
- There are no major deformations of shape (dents, cracks). These will move the tank's centre of gravity and also will establish stress points where corrosion will occur more rapidly, or stress the supporting framework.
- The attachment between the legs and the tank shall be solid — not corroded.



Tanks shall be of sound construction, with no serious corrosion.



Guidelines for the Structural Soundness of Tanks

- Tanks shall be of a design approved by OSH (see p.23).
- The tank shall be sound with no sign of leaks.
- The tank shall be free of any major deformations (dents).

Corrosion of Fuel Tanks

As with support structures, rust can have a major impact on the soundness of a fuel tank. The degree of damage caused by rust is dependent on the thickness of the steel used in the tank's manufacture, and the thickness that the rust has penetrated. The Dangerous Goods Regulations outline the minimum thickness of plate allowed, but the actual thickness of plate used in the manufacture of tanks is often greater than that specified in the Regulations.

Areas at particular risk of rust damage are:

- On the top of tanks, especially if they are cylindrical tanks mounted on end;
- On the underside of tanks;
- Around the fill point, and the drain plug;
- On the welded seams;
- At the joints between the tank and the support structure.

Guidelines Regarding Rust on Tanks

- Rust present on the tank should be dry surface rust only, that has not impacted on the tank's structural integrity.
- Only surface corrosion or shallow pitting is acceptable. The depth of rust can be easily determined by carefully prodding of the empty tank with a screwdriver. Pitting shall be no more than one-third of the wall thickness.
- If there is evidence of deeper pitting on the tank, then the tank should be inspected by a person qualified in this type of work.
- Any "wet" rust (where the fuel is leaking through the rusted area) is totally unacceptable.

Fittings, Pumps and Hoses

The bulletin checklist asks:

- Q** Are fittings, pumps and hoses free of leaks and undamaged?

The most likely environmental and safety risks associated with farm fuel tanks are from leaks, or from careless overflows during fuel transfers (either at filling or when using fuel from the tank).

Under the Resource Management Act, it is illegal to discharge unauthorised contaminants to land and water. This includes allowing leakage from fuel storage vessels.

In addition to the damage to the environment and the safety issues, leaks can cost the farmer a great deal of money.

The Cost of a Drip!

***A valve leaking one drip every
6 seconds equals 4.3 litres every
day or about 1600 litres every year.***

***Each dripping line could be
costing the farmer over
\$1000 per year!***

Guidelines for Hoses, Pumps and Guidelines for Fittings on Fuel Tanks

- The tank hose shall be of a suitable material for the fuel being stored, and be free of any perishing.
- There shall be an isolation valve **on the tank outlet** before the dispensing hose to ensure there is a means to isolate the tank contents should the dispensing hose or nozzle develop a leak. The isolation valve should be made of steel and be suitable for the intended service.
- The hose should be fitted with a proper filling nozzle with a trigger valve mechanism.
- All fittings, pumps, valves and hoses shall be free from any leaks, or be repaired or replaced.



Farm fuel storage tanks must be at least 6 metres away from combustible materials such as hay.

Hazards Associated with the Location of Flammable Liquids

The bulletin checklist asks:

- Q** Are ignition sources 15 metres away from the fuel storage?
- Q** Are chemicals and fertilisers stored away from fuel?

The hazards associated with the storage of flammable liquids are different for petrol and diesel.

Petrol is a highly flammable liquid. Petrol vapour is heavier than air and it can travel a long way from the fuel source. There shall be no ignition sources within 15 metres of petrol storage tanks.

Diesel is not as volatile and the isolation distance from an ignition source can be reduced to 6 metres.

(Note this differs from the 8 metres referred to in the farming bulletin *Safe Farm Fuel Storage*.)

Guidelines for Isolation of Flammable Liquids

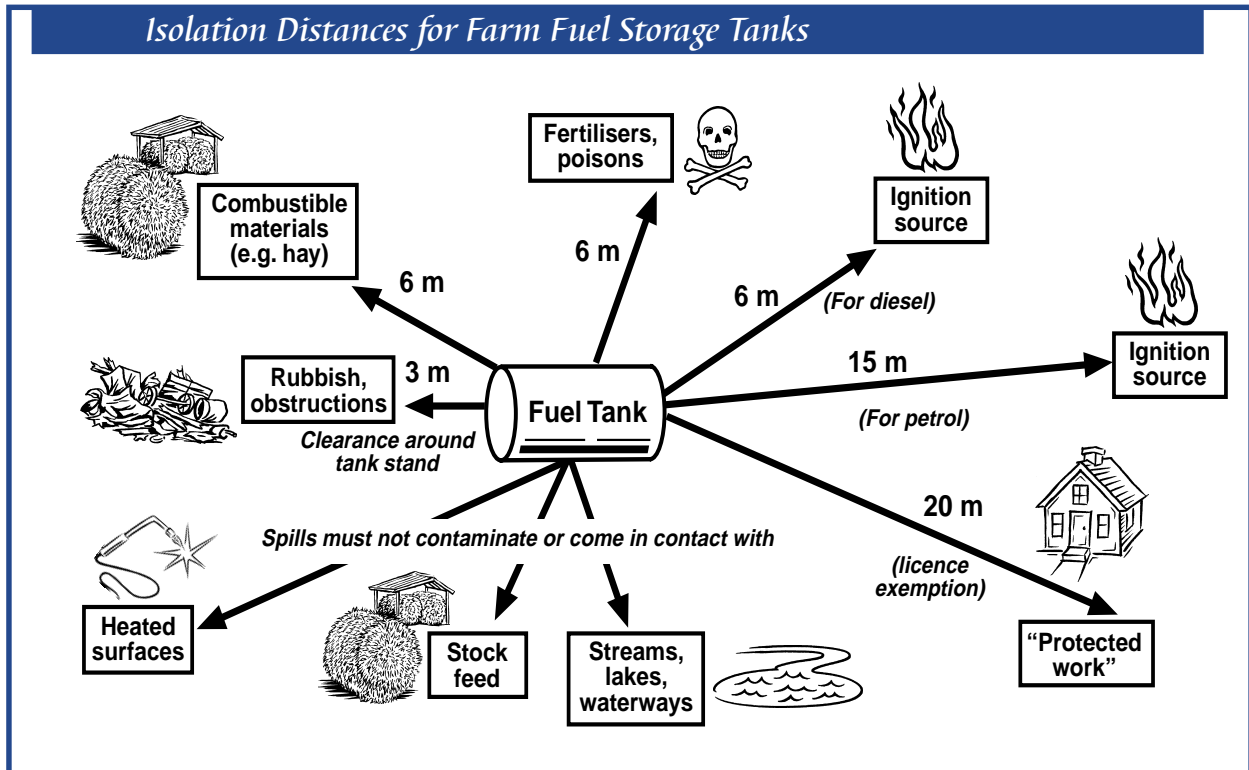
Farm fuel storage systems shall be located so that they meet the parameters outlined below.

- Petrol fuel storage tanks shall be greater than 15 metres from an **ignition source**.
- Diesel fuel storage tanks shall be greater than 6 metres from an **ignition source**.
- All fuel storage shall be:
 - at least 6 metres from any other hazardous materials, e.g. oxidisers, fertilisers, poisons;
 - at least 6 metres away from any combustible materials, e.g. hay, LPG;
 - positioned so that any spills cannot contaminate stock feed;
 - positioned so that spilt fuel cannot come into contact with any heated surfaces;
 - positioned so as to avoid accidental collision by vehicles;
 - positioned so that any spills will not contaminate streams, lakes or waterways.
- **Ignition sources** include anything that could ignite vapour from the fuel storage area. Examples are:

Naked flames	These include fires or incinerators (keep them well clear of the fuel storage area), plus the use of tools such as welders. It also includes smoking – smoking shall never be allowed within 15 metres of fuel tanks.
Electrical appliances	These include electrical fittings such as switches, lights, three-pin plugs and switch boards, plus any electrically powered tools or machines. Also included are electric fence controllers.
Running engines	These include compressors, freezer motors, etc. Vehicle motors shall be switched off when delivering fuel either to or from the storage tank, with the exception of the use of approved fuel dispensing equipment.
Sparks from tools	Any grinders or tools that could cause sparks (e.g. metal drills) should be used well away from the fuel storage.
Static electricity	A sufficiently large build-up of static electricity will cause a spark to discharge, and if this happens in an area containing flammable vapours, fire or explosion can result. Build-up of static electricity can be lessened through earthing the fuel tank. Metal tank supports provide a good earth contact, but where tanks are not earthed through a metal support structure, they must always be earthed using an earthing rod.
Fertilisers and chemicals	Some chemicals when mixed with fuels can result in spontaneous combustion or the production of deadly gases. All fuel storage shall therefore be more than 6 metres from fertiliser or chemical storage.

The isolation distance is extremely important when the tank is either being filled or fuel is being drawn off.

Farm fuel tanks shall be at a greater distance than those shown below. With the exception of the clearance distance around the tank stand, quoted distances are current legal requirements.



The delivery tanker shall be able to safely enter the property off a public road.

Access to the Fuel Storage Facility

There are four aspects to "safe access" for farm fuel delivery:

Access to the Farm from a Public Road

The delivery tanker shall be able to safely enter the property off a public road.

Access to the Fuel Tank Site via the Farm Road

Safe access to the farm tank is partly supplier-dependent, i.e. the access should be safe for the delivery system being used by the supplier.

The access track should be constructed so that it can be used in all weathers.

The access track for the delivery tanker shall be in a state of

good repair with all overhanging trees trimmed back to avoid damage to the delivery tanker. Care should be taken with any overhead power lines.

Any culverts or bridges on the farm shall be able to take the weight of a fully laden fuel delivery tanker. Note that farmers have a duty to provide safe access to their properties, which includes ensuring bridges, culverts, etc. can safely be negotiated by the fuel tanker. If there is any doubt, the farmer may be asked to supply appropriate evidence that the structures can hold the traffic required to use the access.

Consideration should be given to turnarounds so that the delivery tanker does not have to back to the fuel tank site, thus minimising the necessity for difficult or dangerous reversing and manoeuvring.



The area within 3 m of the tank shall be free of all obstacles.

Access Between the Delivery Tanker and the Fuel Tank

The area between the delivery tanker and the filling point of the fuel tank shall have adequate clearway — it should be free of all rubbish, obstacles, machinery, junk, etc. within 3m of the legs, so that the driver can safely move between the truck and the ladder to the fill point.

Access to the Fuel Tank Fill Point

The tank delivery fill point shall be clear of anything that prevents the nozzle of the delivery hose being totally inserted.

The dip and fill points should be able to be accessed and opened from the ladder without requiring excessive reaching. Accessing the dip and fill points should not require the driver

Guidelines For Access to the Farm Fuel Storage

- The delivery tanker shall be able to safely enter the property off a public road.
- The tank should be located on the farm so that it can be safely accessed by the fuel supply company in all weathers.
- Any culverts or bridges on the farm shall be able to take the weight of a fully laden fuel delivery tanker.
- The truck access shall be in a state of good repair, with all overhanging trees trimmed back. Overhead power cables shall be of sufficient height to allow safe access.
- The area within 3 metres of the tank stand should be clear of all encumbrances (rubbish, obstacles, machinery, junk, etc.).
- The tank delivery fill point shall be clear of anything that prevents the nozzle of the delivery hose being totally inserted, and be able to be easily accessed and opened from the ladder or access platform.

to climb off the ladder on to the tank or other structure, unless using a correctly constructed access platform. The driver should be able to clearly see into the fill point from the ladder while refuelling the tank.

Health Risks

Petrol contains amounts of aromatic hydrocarbons that can be smelt in petrol vapours. Some of these substances are the same chemicals found in glues and solvents. Inhaling petrol vapours should be avoided.

The acute effects of these toxic vapours are dizziness, nausea, headache and vomiting, similar to intoxication from alcohol. Anyone suffering from the effects of petrol vapours should remove themselves from the area and avoid activities such as driving vehicles and operating machinery.

Resist the temptation to use petrol to remove oil, grease, paint or glue from your hands so as to avoid absorption through the skin. Besides being a cause of dermatitis and rashes, hydrocarbons can pass through the skin and enter the blood stream, adding to the toxic effects. If you do have skin contact, wash with soap and water.

Besides the intoxicating effect of acute exposure, long-term symptoms may include neurological damage and increased susceptibility to leukaemia.

Advice on how to treat exposure to fuels can be obtained from the Material Safety Data Sheets, available from the fuel supplier.



Any fuel spillage or leakage must be stopped and then cleaned up.

Emergency Procedures

Both the farmer and the fuel delivery organisation shall have in place emergency procedures to deal with situations such as fuel spillage, fuel leakage or fire. These should include having available an appropriate spill kit for the fuel being stored, and a fire extinguisher.

The prime concern is the safety of any persons near the emergency.

In the case of a spillage or leakage of the fuel, the immediate remedial action is to stop the spillage or leakage at the source. Then:

- Stop the product escaping to drains or waterways.
- Clean it up (if it is safe to do so).
- Contact your fuel supplier or regional/district council regarding disposal of contaminated material.

Your local council should be advised of any fuel spillage, especially if it endangers a waterway. Most councils have an emergency Pollution Hotline.

With petrol spillage, special care should be taken to avoid any action that could cause ignition of the petrol vapours. This includes not using communications equipment within the danger area.

In the case of a fire, raise the alarm — phone the Fire Service.

- Fight the fire only if you consider it safe to do so.
- Ensure all people are in a safe area.
- Do not put yourself at risk.

Training and Supervision

People who are involved with the handling and storage of fuels shall either have adequate knowledge and experience, or be supervised by a person with adequate knowledge and experience, and be adequately trained to work safely with the fuel storage facilities.

Farmers shall ensure that anyone who is required to use the fuel storage system on their farm has been properly trained in:

- how to use the fuel storage facility safely;
- what the potential hazards are when using the fuel storage system, and the precautions to be taken, including the use of protective clothing and equipment;
- what to do in the case of an emergency, e.g. a fire or a fuel spill.

Exemption from Licences for Farm Fuel Storage



Anyone using a fuel storage facility on a farm should be properly trained.

A licence is normally required to store dangerous goods (including fuels). The Dangerous Goods (Licensing Fees) Regulations 1976 allows dangerous goods (including fuels) to be stored on a farm without a dangerous goods licence provided that:

- the farm is 4 ha or larger; and
- the above-ground tanks are less than the stated maximum volume (2,000 litres for petrol and 5,000 litres for diesel), and the tanks and the attached fittings are of an approved design and construction; and
- the tanks are more than 20 metres from any “protected work”; and
- the tanks are located more than 6 metres away from combustible materials; and
- the tanks are either compounded or located such that any spillage will not endanger any building or flow into any stream, lake or natural water.

Guidelines Regarding Exemption from Licence Fees

- An exemption for a dangerous goods licence on farms is only made if the provisions outlined in the regulations are met.
- A farm dwelling would be included as a “protective work”. So would a farm building in which people are employed (such as a packing shed or shearing shed).
- In general, fuel tanks should be at least 20 metres from all buildings unless, in consultation with the OSH HSNO Inspector or territorial authority District Hazardous Substances Officer, the building that is near the tank is deemed not to be a protected work.

Although farms meeting these criteria are exempt from the need to hold a dangerous goods licence, the risks involved with fuel storage still exist, and the standards outlined in the Dangerous Goods Regulations should still be adhered to. Also, there may be requirements specified in the relevant Regional or District Plans relating to tank location.

General Information

Environmental Considerations



Example of a compound to contain fuel if a leakage or spillage occurs.

While these guidelines focus on health and safety hazards, aspects of the Resource Management Act 1991 can also apply to farm fuel storage. The relevant requirements for fuel storage in your area may be included in the appropriate Council’s Regional and/or District Plan, and your local authority should be contacted to provide this information.

Contamination of the soil or waterways as a result of leakage or spillage of fuel on farms is subject to the enforcement provisions of the Resource Management Act. Any illegal discharge may result in prosecution in the Environment Court, plus the costs of cleaning up the spillage or leakage. These costs may be far in excess of the value of any lost fuel.

Farmers should therefore be careful to ensure that farm fuel tanks are both used and maintained so that no ground contamination below the tanks occurs. Care should also be taken when locating fuel tanks to minimise the chance of leakage or spillage of fuel entering waterways.

Where there is a danger of a fuel leakage or spillage entering a watercourse, the tank should be located inside a suitable compound that will contain the fuel if leakage or spillage occurs.

OSH Approval of Tank Design

Currently, above-ground tanks are required to be built to a specification approved by the Senior Specialist, Hazardous Substances. It is a requirement of the design approval that the manufacturer places on the tank a plate detailing capacity, who made the tank, and the Dangerous Goods Approval Notification Number, plus the year of manufacture and specification. This system has been in place for the past decade.

For recently constructed tanks, a farmer can ascertain whether a tank is an approved design by referencing the DG Approval Notification Number on the plate. Where this plate is not present, the farmer can request evidence from the manufacturer of the approval by OSH (Explosives and Dangerous Goods).

Earlier tanks may not have an Approval Notification Number, or the label may be lost. It may not be possible to determine the manufacturer. ***Existing tanks, where they are have been designed and built for the purpose of storage of fuels, can continue to be used provided they are in good condition and meet the other requirements of this guideline.***

It should be noted that OSH (Explosives and Dangerous Goods) approval of the manufacture of tripod (three-legged) stands on fuel tanks was cancelled in 1996. Any tank with a tripod supporting structure that has been manufactured since 1996 will not have been constructed to an approved OSH standard, and therefore will not meet the standards of this guideline.

Tank Labelling

The content of the fuel tank should be identified on the tank, either with a label or through colour-coded marking. The product identification should be clearly placed on the tank so as to be easily read from ground level.

Tank Ventilation

Adequate ventilation of the tank is required to prevent splash back during the filling process and to allow for changes in air pressure inside the tank. The air vent shall be separate from the filling point unless the filling point is of adequate size to allow the safe displacement of the air during the refilling. The ventilation pipe shall be not less than half the size of the filling pipe and of such size as to prevent unsafe pressures developing. The ventilation pipe shall be kept clear of obstructions.

Where air vents are fitted, the air vent shall have a gauze fitted of the appropriate size for the fuel being stored. For petrol tanks, the gauze in the vent shall be of a brass wire, of 500 microns variety. This acts as a flame arrestor should there be a flashback of vapours to the tank. For diesel tanks, the gauze can be more coarse as the main purpose is to prevent material going in the vent.

Repairs to Tanks

Before carrying out any repairs to tanks or the support structure, the hazards associated with welding or cutting near fuel tanks need to be assessed. Guidance on this operation can be found in the OSH publication *Hot Work on Drums and Tanks*.

Spill Kits

Basic spill kits should be kept where spillage or leakage from the fuel tank may lead to the contents flowing to a water course. The spill kit may consist of a load of sand, or some other absorbing material beside the storage area to soak up any spills before they endanger the environment. Commercial spill kits are available that include absorbent pads or booms.

Tank Colour and Location

The colour of the above ground tank, and whether it is under the shade or not, will have a huge effect on how much fuel gets lost through evaporation. This especially relates to petrol storage.

For instance, in midsummer the evaporation from a 1200 litre petrol tank will be:

- **30 litres loss** per month from a **red tank with no shade.**
- **24 litres loss** per month from a **silver/white tank with no shade.**
- **10 litres loss** per month from a **silver/white tank in shade.**

Where possible, locate petrol tanks in shade and have them painted in a light colour.



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