Illustrated Homeowner's Guide

to Heating Oil Tanks

Government of Nunavut
Department of Environment
Environmental Protection Division

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1 Introduction

As a result of a marked increase in spills from home heating oil tanks over the past several years, and the subsequent costly cleanup expenses borne by Nunavut homeowners, the Department of Environment developed and released the *Illustrated Homeowner's Guide to Heating Oil Tank Inspections* in 2008. Subsequent to the initial release of the Guide, additional useful information has come to light, hence the necessity for a 2011 update. Some sections of the Guide have been expanded. Additional illustrations have been included in an attempt to provide the homeowner with the latest and most helpful information possible.

While this Guide was developed with the private homeowner in mind, it can also be used by commercial/institutional/government building owners and/or property managers. Additionally, it should serve as a useful guide to anyone contemplating the purchase of a new home. Many prospective home buyers give little or no consideration to the condition of the heating oil tank and associated fittings. Knowing beforehand the potential environmental and financial liabilities associated with sub-standard heating oil tank installations would most certainly bring this consideration to the forefront.

Nunavut's *Environmental Protection Act* (EPA) prohibits the discharge of a contaminant into the environment. Heating oil, when spilled, is considered to be a contaminant. The EPA further stipulates that the person in charge, management or control of the contaminant, is responsible for the cleanup of any spills of that contaminant. In other words, if you are a homeowner, and your heating oil tank springs a leak or is overturned or sustains any other kind of damage which results in an oil spill, you are responsible for the cleanup of that oil spill and any other associated costs. As you will note after reading the case histories presented in this Guide, the cleanup costs can be very high and often place enormous and crushing financial burdens on individual homeowners.

The purpose of this Guide is threefold:

1. As a pollution prevention measure;
2. To alert home and building owners about the potential environmental and financial liability that may be just outside their door; and
3. Provide simple and practical advice on what steps can be taken to minimize the chances of an oil spill from your heating oil tank.

All oil tanks and associated appliances, equipment, components and accessories must be installed in accordance with *B-139-09 Installation Code for Oil Burning Equipment.*

1.1 Use of this Guide

This Guide is provided as a courtesy only. It is not intended to be an all-encompassing manual on the proper installation and maintenance of heating oil tanks and accessories; nor does using it guarantee a clean bill of health for the installation being inspected. It is intended to provide the homeowner with a general outline of the obvious areas where maintenance or risk prevention is advisable. The homeowner is responsible for ensuring that their heating oil tank is inspected and serviced by a qualified professional to ensure that it is physically and mechanically fit and completely safe for its intended use.

To the prospective home buyer: it is strongly recommended that, in addition to conducting your own inspection of the heating oil tank and associated fittings and accessories, you should follow this up by having a qualified oil burner or boiler mechanic do the same.

1.2 Acknowledgements

Drafts of this Guide were presented to individuals from the private and public sector for review and comments. DoE gratefully acknowledges the contributions provided by the Government of the NWT Department of Environment and Natural Resources; Environment Canada; the NWT Housing Corporation; Senior Flexonics Canada and last but certainly not least, the plumbers, oil burner and boiler mechanics and installers from Iqaluit who provided valuable technical advice.

2 Roles and Responsibilities

2.1 Department of Environment, Environmental Protection Division

The Environmental Protection Division (EPD) of the Department of Environment (DOE) is the Government of Nunavut (GN) agency responsible for initiatives that control the discharge of contaminants and their impact on the environment. EPD is responsible for ensuring that environmentally acceptable management procedures, emission levels and disposal methods are maintained.

By practice, EPD programs are applied primarily to Commissioner's Land, lands administered by municipal governments or GN undertakings. Legislative authority is provided by the *Environmental Protection Act* (EPA) and *Pesticide Act*. Contact EPD for a listing of relevant regulations and guidelines.

2.2 Department of Community and Government Services, Protection Services

The Department of Community and Government Services (CGS) role in heating oil tank installation and maintenance is governed by two pieces of legislation: the *Nunavut Fire Prevention Act and Regulations* and the *Boiler and Pressure Vessel Act and Regulations*.

Safety Services of CGS will look at any new fuel tank installation, from the point of view of the B-139-09 code, for any fuel tank feeding a boiler that falls under the auspices of the *Boiler and Pressure Vessel Act and Regulations*. Such boilers and tank systems must be installed under a permit issued by the Chief Boiler Inspector of the Territory.

Boilers that fall under the auspices of the Act include any boiler that produces 30kW or more thermal energy or that provides thermal energy to any building other than a private residence that houses less than three families.

Installation of heating oil tanks are regulated by the *Nunavut Fire Prevention Act*; tanks with a capacity of greater than 2500 L are governed by the *National Fire Code*, whereas oil tanks under 2500 L are covered by *B139-09 Installation Code for Oil-Burning Equipment*.

2.3 Environment Canada

In June 2008 Environment Canada brought into force the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*. The purpose of these Regulations is to reduce soil and groundwater contamination due to leaks and spills of petroleum products and allied petroleum products from storage tank systems.

The Regulations apply to storage tank systems that contain petroleum or allied petroleum products and that are located on federal and Aboriginal lands, are operated by or belong to federal departments, boards, agencies and Crown corporations, and those that are operated by or belong to certain federal works and undertakings that are ports, airports and railways. These Regulations apply to storage tank systems with a capacity over 230 L with the exception of storage tank systems with a capacity of 2500 litres or less and that are connected to a heating appliance or an emergency generator. As most residential heating oil tanks have a maximum capacity of 1,135 litres, homeowners are generally exempt from the Regulations.

The Regulations require owners of regulated storage tank systems to identify them to Environment Canada, display the identification number and meet requirements set out in the Regulations. These include but are not limited to: emergency plans, record-keeping, leak detection and monitoring, repair or removal of leaking systems, decommissioning of high risk systems, reporting spills and containment of transfer areas. Some activities require involvement of approved people. The Regulations also include obligations for product deliverers in order to reduce incidents during product delivery. The Regulations set forth requirements for the design and construction of new storage tank systems and refer to national and international industry standards. Environment Canada has developed a series of tools and seminars that provide guidance on compliance.

The Regulations do not typically apply to lands under the Nunavut Land Claims Agreement or lands transferred to municipalities except for federal facilities (RCMP, National Defence, Government of Canada offices) that are located within Nunavut municipal boundaries. ***Commercial, government and industrial storage tank facilities on Nunavut Commissioners lands may, however, be captured by these Regulations. Owners/Operators/Managers are therefore strongly advised to contact Environment Canada to determine if their facilities are subject to the Regulations.*** Further information is available at www.ec.gc.ca/rs-st.

2.4 Homeowner

The homeowner is responsible for ensuring that his heating oil tank and accessories are kept in good working order and are in compliance with current environmental and other regulations and codes of practice. In the event of an oil spill, the homeowner is ultimately responsible for cleaning up the spill and further, bringing the affected land back to a condition that meets acceptable environmental standards. Refer to *Environmental Guideline for Contaminated Site Remediation* & *A Property Owner's Guide to Contaminated Site Remediation in Nunavut* (http://env.gov.nu.ca/programareas/environmentprotection/legislation).

3 Case Histories

A homeowner noticed that there was a leak in his heating oil tank. By this time, he had lost over half a tank of oil – 700 litres (150 gallons). The oil spill migrated into a small valley behind his house which runs between his neighbours' houses, contaminating several properties. A contractor was hired to clean up the spill. It took them 4 months to complete the job. Total cost for the cleanup came in at $65,000, of which the homeowner had to pay 100%.

A homeowner noticed that his furnace had stopped running. He called an oil burner mechanic to investigate the cause. The oil burner mechanic discovered that the homeowner's heating oil tank had emptied onto the ground beside his house. Some of the oil escaped under his house while the rest contaminated adjacent properties. The cause: accumulated water which collected in the one-inch-diameter drip leg of the oil tank, froze and burst the drip leg, releasing the entire contents of the tank – over 450 litres (100 gallons) – onto the ground. Total cost for the resultant cleanup was $115,000, of which the homeowner's insurance company paid only half. The homeowner had to borrow money from the bank to pay for the cleanup costs.

A heating oil tank attached to a commercial office building sprang a leak, releasing its entire contents onto the ground and underneath the building. As a result, heating oil fumes permeated the building, ruining furniture, carpets, books, etc. Employees complained of headaches. Their clothes and hair smelled of heating oil even after they left the building for the day. Because the building was sitting only one foot above ground level, it was not possible to get at the spilled material under the building by conventional means. The firm renting the building cancelled their lease and subsequently vacated the building citing unsafe working conditions. The building owner not only lost his rental revenue but also faced huge cleanup costs.

The above situations are actual events that could have been avoided had the home and property owners taken a few precautions by inspecting and maintaining their heating oil tank installations on a regular basis. Many homeowners do not give their heating oil tanks any thought whatsoever until something happens and they are facing cleanup costs in the order of tens of thousands of dollars or more.

Aside from the short-term and often enormous cleanup expenses, oil spills can cost the homeowner in the long term by greatly diminishing the value of his property and thus, the re-sale value and re-sale potential of his home.

Over the past 10 years, approximately 325,000 litres (24,000 gallons) – equal to 286 home heating oil tanks – of heating oil has spilled out of heating oil tanks in Nunavut. This represents close to $280,000 worth of fuel (2011 prices). In most cases, these spills were preventable.

While homeowners are encouraged to conduct regular inspections of their heating oil tank and associated fittings and accessories, it should be noted that in addition to this, a qualified professional should conduct a more thorough inspection as part of the annual servicing; at least once or twice per year.

4 Inspection List: What to Look For

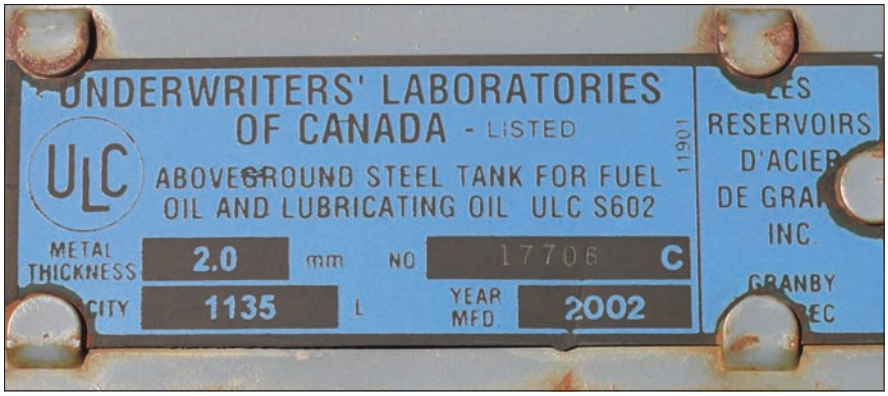
The home/building owner should inspect the following items:

- Certification Plates
- Physical Damage
- Rusting Corrosion
- Tank Stand
- Flex Hoses
- Fittings and Valves
- Fuel Lines
- Vents and Filler Caps
- Drips and Ground Staining
- Oil Level Gauge
- Secondary Containment
- Tank Location

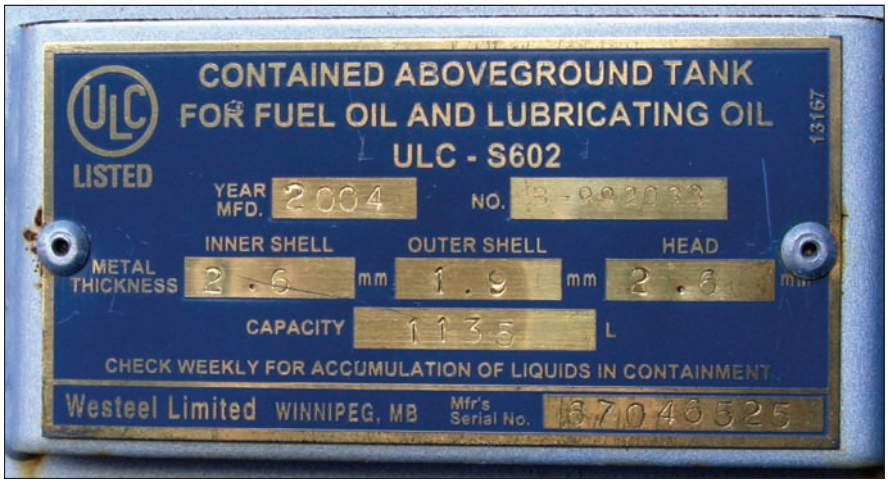
Each of these items is covered in greater detail in the sub-sections that follow.

4.1 Certification Plates

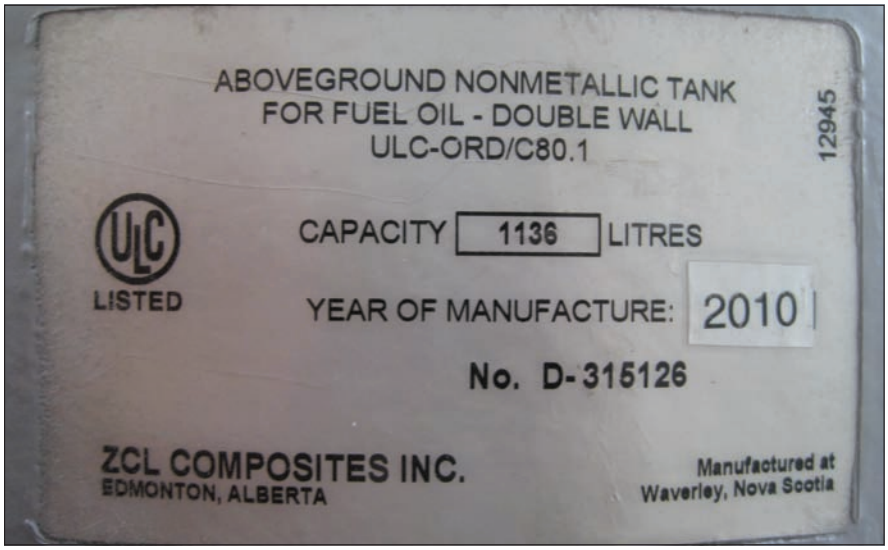
Heating oil tanks should be affixed with a metal plate or sticker indicating that it meets national construction standards (CAN/ULC S602 for steel tanks; ORD/C80-1 for non-metallic tanks). This is usually in the form of a ULC (Underwriters' Laboratories of Canada), UL (Underwriters' Laboratories [USA)]) or CSA (Canadian Standards Association) certification. Most insurance companies require proof of this before they will provide homeowner coverage.



4.1a ULC certification plate: standard, single-wall, steel aboveground heating oil tank



4.1b ULC certification plate: standard, double-wall, steel aboveground heating oil tank



4.1c Certification label for double-wall 250 gallon fibreglass heating oil tank

4.2 Physical Damage

Check for surface rusting. Some surface rusting is normal; however, excessive rusting may be an indication that your tank is approaching the end of its useful life and in need of replacement. Check for excessive denting and any other signs of physical impacts that may have weakened the tank, thus making it more subject to leakage and rupture.

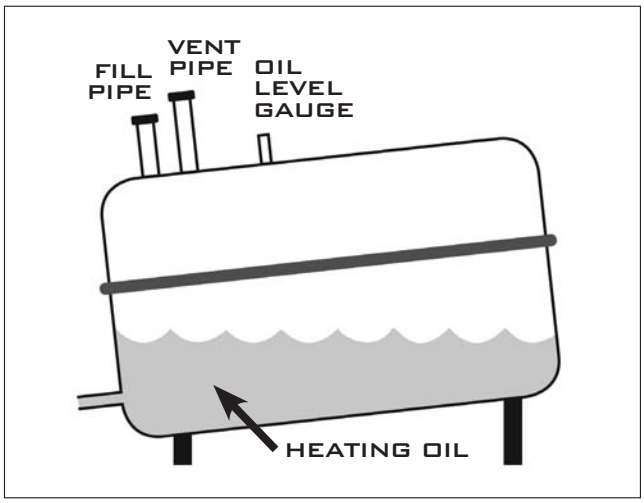
4.3 Rusting/Corrosion

Surface rusting notwithstanding, serious and unseen rusting generally happens from the inside of the tank due to a yearly buildup of condensation water that collects on the bottom of the tank and because of bad fuel.

Environment Canada officials from the Maritimes have reported a phenomenon related to internal rusting: if you notice a dark line along the bottom of your oil tank – it will look like someone has drawn a line along the bottom length of the tank with a marker – the tank is likely on the verge of rupturing and therefore it should be replaced without delay.

Water in and of itself, will cause corrosion in the bottom of a steel tank, however, this process is also greatly accelerated by a phenomenon referred to in the industry as microbial-induced corrosion ("MIC"). While heating oil is toxic to humans there are, nonetheless, microorganisms which, given the right conditions, thrive in heating oil. The water that accumulates at the bottom of a heating oil tank contributes to these ideal conditions. The byproducts of these microorganisms serve to accelerate corrosion in the tank. There are several products on the market which are intended to manage this problem

such as "Killem" which is a biocide that dissolves into the water phase of the heating oil and kills microorganisms on contact. Other heating oil additives are discussed in section 4.3a of this Guide.



4.3(1) Heating oil tanks must be installed with a pitch of ¼ inch to 1 linear foot (10mm to 500mm) toward the tank outlet.

4.3(1) Managing Water and Sludge

Heating oil tanks must be installed with a pitch of ¼ inch to 1 linear foot (10mm to 500mm) towards the tank outlet. In simpler terms, for a standard 250 gallon heating oil tank, the fuel outlet end of the tank should be about 1-2 inches lower than the opposite end of the tank. In this way, water and sludge will drain into the drip leg and/or through the heating system.

Even when installed as such, there is still the possibility for water to accumulate inside the heating oil tank, especially where large volumes of water are present. Heating oil tanks should therefore be drained of accumulated water and sludge at least twice per year: in the early autumn, concurrent to the pre-winter servicing of your furnace, and in the late spring/early summer when the melt season is in full swing. This is not as difficult a task as it may sound: because water is heavier than heating oil, the water will collect on the bottom of the tank while the heating oil floats on top of the water. In this way, water can be drained from the bottom of the tank with relative ease. Refer to Section 4.4 for further details.

Detecting water in your heating oil tank is the first step toward preventing problems down the road.

Homeowners can purchase chemical indicators such as "TESTMASTER" (http://www.rectorseal.com/index.php?site_id=1&product_id=150) which will detect the presence of water. These are thick pastes that are applied to a dipstick and which will turn a fluorescent colour if water is present in the tank.

4.3(1) One of several commercial water dispersants that can be used to manage water in heating oil.

Dispersants are an effective method for managing small amounts of water in heating oil. The simplest of these is methyl hydrate, which is the same constituent found in gas-line antifreeze. Methyl hydrate will act to dissolve any water present; this mixture, will in turn, dissolve into the heating oil, and depending on the amount of water present, will run through the system without any ill effect. There are several commercially-available dispersants such as "Aquasorb" and "Hot 4 in 1 Heating Oil Treatment".

By way of example, "Hot 4 in 1", which was recommended by a Nunavut heating and plumbing firm, comes in 16 ounce bottles and will treat 230 imperial gallons of heating oil. In addition to being a water dispersant, "Hot 4 in 1" is also an anti-waxing and gelling compound. This product is available from many plumbing and heating firms. Products such as "Aquasorb" and "Hot 4 in 1 Heating Oil Treatment" are more expensive than methyl hydrate; however, they are also more effective for the intended purpose and also provide a broader scope of fuel treatment.

Water dispersants are intended to manage small quantities of water such as that generated through condensation. ***It should be understood, that water dispersants are not an effective means for managing large quantities of water within the tank. Water should be regularly removed from the tank through the drip leg (see section 4.4).***

In reading over this section, the homeowner may feel bewildered by the wide variety of fuel additives intended to manage water, sludge and microbes; all of which cause corrosion in (steel) heating oil tanks. For this reason, it is strongly recommended that the homeowner consult a plumber/oil burner or boiler mechanic to determine which product or products are best suited for their situation.

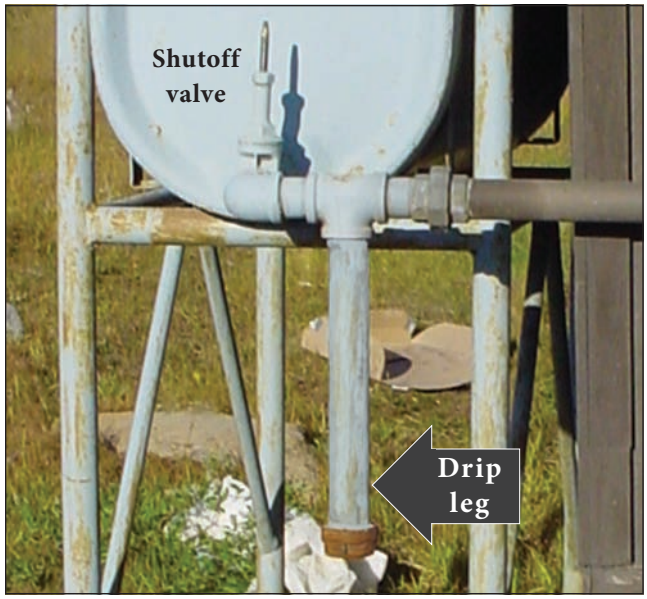
4.4 Drip Leg/Drain Plug

A drip leg is a section of pipe which runs at right angles to the main fuel line and which protrudes below the level of the bottom of the oil tank. In this way, water will naturally collect in this low spot in the fuel system, making it easier to remove.

In addition to causing corrosion in steel tanks, accumulated water can cause other problems too. If allowed to accumulate water will, during the winter months, freeze, expand and possibly rupture the drip leg, consequently releasing the entire contents of the heating oil tank onto the ground. Drip legs should be drained twice per year: autumn and late spring/early summer.

It is strongly recommended that this task be performed by a qualified plumber or oil burner or boiler mechanic.

The section of fuel line exiting from the bottom of the oil tank and immediately before the drip leg should be fitted with a shut off valve so that the oil tank can be isolated, thus preventing the accidental release of oil from the tank while the drip leg is being drained of water.



4.4 Drip leg extends below the level of the fuel line.

Ensure that the bottom of the drip leg is fitted with a screw-on end cap and that the cap is tightened down so that it cannot be removed by hand. This prevents tampering by children and vandals.

A fuel line and drip leg of a large diameter – two inches – is the preferred configuration for the Arctic as it is much more forgiving if accumulated water freezes inside of it. Narrow diameter fuel lines of one inch and less are far less forgiving and tend to rupture when water freezes inside of them. If the fuel line/drip leg diameter is less than two inches, the drip leg should be as long as possible – a minimum of 12 inches – to increase its capacity to hold water.

There is a growing school of thought – particularly in some parts of southern Canada – that drip legs should be avoided altogether. The rationale behind this is that water and sludge should never be allowed to accumulate in any part of the system but instead, should be allowed to flow though to the heating appliance. This rationale assumes only small amounts of water and sludge which can be handled by the in-line filters and fuel-water separators on most oil burner systems and without causing damage to the appliance. In Nunavut, however, for various reasons, the water-in-fuel problem is more pronounced than it is in the south. For this reason, all of the professional tradesmen consulted for this Guide recommended that drip legs continue to be an integral part of the system. For a more detailed discussion, refer to Section 6.2 of this Guide.

4.5 Tank Stand

In Nunavut, buildings must be elevated well above ground level to prevent melting the underlying permafrost. As a result, heating oil tanks in Nunavut have traditionally been placed on an elevated platform, usually a tank

4.5a Unstable tank installation: the tank stand is not secured to a solid foundation, thus the tank and stand have a noticeable lean to the right. A good strong wind or a minor physical impact would be enough to topple the tank.

4.5b This heating oil tank was resting on a wood-metal stand, which eventually collapsed under the weight of the tank, spilling 445 litres (100 gallons) of heating oil onto the ground.

4.5c Note the tank stand modification: the owner has broadened the base of the metal tank stand and added reinforcing struts at 45 degree angles to further strengthen the base. This has provided significantly more stability to the installation than would be afforded by the original unmodified stand.

4.5d A twin tank installation firmly secured to a full concrete pad. This provides a solid foundation.

stand, to provide for gravity-assisted fuel flow to the heating appliance (refer to Section 6.3 for a more detailed discussion). While this practice has resolved one problem, it has resulted in the creation of others.

A full 1,135 litre (250 gallon) tank weighs approximately 1000 kg (2,025 pounds) or one ton. Standard metal tank stands are inherently unstable because they are top-heavy, have a narrow base and therefore are subject to tipping over unless properly anchored. Tank stands should be bolted to a solid footing and/or fitted with a very broad base. An ideal foundation consists of a large concrete pad onto which the metal tank stand is firmly bolted. Alternatively, the stand can be bolted to **treated** wood timbers (a minimum of 6 inch x 6 inch) which should be installed such that the top of the timber is at ground level. Even when bolted to a solid base, the installation is only as strong as the bolts used to anchor it. For this reason alone, the homeowner should consider modifying the tank stand by broadening the base, thus providing more inherent stability (Illustration 4.5c).

Many installers and homeowners make the mistake of anchoring the heating oil tank and stand to the building's siding, which in itself is fastened to the building with thin wooden strapping. This provides virtually no holding strength and certainly not enough to hold one ton of dead weight.

4.6a The flex hoses on this installation are out of alignment, possibly due to ground shifting. In other words, the flex hoses have served their purpose: a solid fuel line would have broken under the stress, resulting in an oil spill. Nevertheless, the flex hoses appear to have reached their limit of flexure. Now it is time to re-align the tank and fuel line fittings. This will likely require that the tank foundation be shored up and reinforced and that the flex hoses be replaced. Failure to attend to this situation in a timely manner will likely result in one or more of the flex hoses shearing and the entire contents of the affected tank(s) emptying onto the ground.

4.6b This flex hose has reached the limit of its flexure. The fittings must be re-aligned and the flex hose replaced with a new one. Any further movement will likely result in a broken flex hose and subsequent release of the entire contents of the heating oil tank onto the ground.

Many spills occur as a result of the heating oil tank and stand tipping over due to wind, the weight of accumulated snow and ice, and children climbing on them.

Wooden tank stands should not even be considered: they are generally rickety and weak; furthermore, they are prohibited under the *National Fire Code of Canada*.

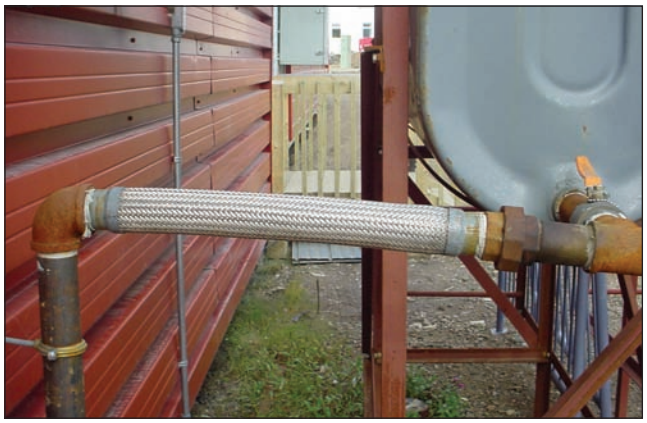
Heating oil tanks are particularly subject to toppling over during the spring runoff, when flowing meltwater tends to undermine the ground upon which the oil tank and stand rest. For this reason, heating oil tanks should be situated on a dry, well-drained location and well clear of any pathways of flowing water.

4.6 Flex Hose

Flex hose is intended to compensate for heating oil tank and/or building shifting; it is ***not intended to compensate for misaligned fittings***. Under normal conditions and when initially installed, the flex hose should be aligned in a straight line. If the flex hose is "S"-shaped and/or out of alignment, the tank and fittings should be re-aligned.

Flex hose should not be compressed along its long axis. To test for this, inspect the steel weaving of the flex hose by grasping it with your hand. If the weave is "bagged"; that is, if it is loose and you are able to compress it by hand, the flex hose needs to be replaced. The steel weave provides the structural strength of the flex hose and therefore it must fit tightly around the inner lining. By way of illustration, when a flex hose becomes bagged, it loses 96% of its internal strength.

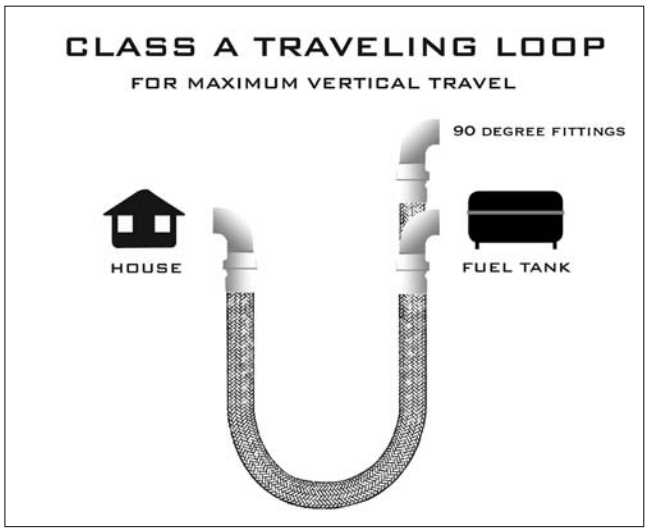
Flex hose should not be installed through a building wall.



4.6c This flex hose has been properly installed: note that it is aligned in a straight line and the steel weave is tight.

4.6(1) Flex Hose Tolerances

The flex hose manufacturer who was consulted for this Guide has suggested that a 2 foot length of flex hose provides an allowance of 2 – 3 inches of vertical movement. As a general rule of thumb, one foot of flex hose provides for a little over 1 inch of vertical movement. As you can see, it would take a considerable length of flex hose to accommodate even 6 inches of vertical movement of the heating oil tank. For this reason, the manufacturer recommends a "Class A Travelling Loop" which allows for maximum vertical movement.



4.6(1) Class A Travelling Loop (Courtesy of Senior Flexonics Canada). Note: this diagram is for illustrative purposes only; contact the manufacturer for the exact specifications required to install a Class A travelling loop.

This installation, however, presents its own unique problem in that any water in the system will tend to accumulate in the bottom of the loop and freeze during the winter months. The professional tradesmen consulted for this Guide have suggested that this arrangement may not be practical in an arctic environment. The only alternative is to ensure that the flex hose is of sufficient length to accommodate any expected vertical movement of the tank.

If in doubt, talk to a qualified plumber, or oil burner or boiler mechanic.

4.7 Fittings and Valves

Examine all fittings and valves. Look for signs of rust, corrosion and any other mechanical distress. Check for leakage and weeping (a thin film of oil coating the area around the joints). If you find or suspect any such defects, contact your oil burner or boiler mechanic and have him inspect, and if required, repair the defect as soon as possible.

Valves should be of the highest possible quality. The oil burner mechanics consulted for this Guide recommended that the oil tank be provided with a ball valve with a high pressure rating. High-grade valves, while not impervious to bursting under the pressure exerted by forming ice, have a much better chance at surviving the experience intact than do cheap, low-quality, low pressure-rated valves.

4.8 Fuel Lines

Excessively long fuel lines should be avoided. The longer the fuel line, the more it will be subject to breakage due to ground shifting, vandalism and accidents.

Ideally, the length of the fuel line between the heating oil tank and heating appliance should be as short as possible: from the heating oil tank on one side of the wall, to the heating appliance on the other side of the wall. If lengthy fuel lines are unavoidable (such as a heating oil tank located on the side of the house opposite the mechanical room) the line should be firmly supported along its entire length. Furthermore, fuel lines should be easy to access for regular inspections. If you cannot easily see it, then you will not see developing problems. If the fuel line runs underneath your home, take the time to inspect it every once in a while; at least 3 or 4 times per year, and definitely ensure that it is inspected by a qualified oil burner or boiler mechanic at the same time that your furnace is being serviced.

4.8 These unsupported fuel lines – particularly the longer return line – provide a convenient monkey bar for children to play on, with predictable results.

Buried fuel lines should be avoided. Buried fuel lines cannot be inspected and further, are particularly subject to corrosion and mechanical distress. Furthermore, any developing problems will likely remain undetected until a spill occurs. By this time, the damage has been done and now you are facing expensive cleanup costs. A significant volume of heating oil has been spilled in Nunavut as a result of ruptured underground fuel lines that remained undetected for months.

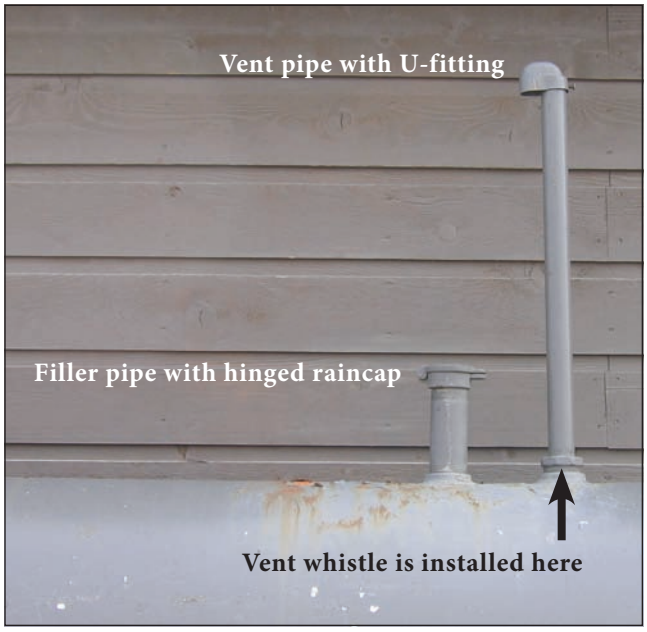
If you find that your fuel line is subject to burial by drifting snow, it is strongly recommended that you take steps to install structural support along the affected section of the fuel line – consult your oil burner or boiler mechanic or plumber for advice on how to best do this – and regularly clear the drifted snow from around the fuel line. Alternatively, consider re-locating the fuel line to an area not subject to drifting snow.

4.9 Vents and Filler Caps

Ensure that the heating oil tank vent pipe is clear and free of obstructions.

A vent whistle should be installed. A vent whistle is a device that is fitted directly onto the oil tank at the base of the vent pipe. Note Figure 4.9a: the "tail" of the vent whistle protrudes into the oil tank. Only the top two inches of the vent whistle will be visible after it has been installed. It whistles (very much like a kettle on a hot stove) as the oil level reaches to the top of the tank during re-fueling. This alerts the oil delivery man that the tank is becoming full. When the oil reaches the tail of the vent whistle, it stops whistling. At this point, the fuel delivery man, if he is paying attention (as he should be), should stop filling the tank. This prevents overflows and spillage. It also ensures that there will be sufficient air space between the oil and the top of the tank to allow for thermal expansion of the oil. This air space is also is referred to as "headspace". Refer to Section 6 of this Guide for further details about headspace.

4.9a Heating oil tank vent whistle: the tail of the vent whistle protrudes into the oil tank; the vent pipe screws into the top of the vent whistle.



4.9b Note the length of the oil tank vent (the pipe on the right hand side of the tank) is roughly one foot higher than the filler pipe.

It is worth mentioning that ***the person delivering the heating oil must stay with the fuel nozzle at all times during the re-fueling of your heating oil tank.*** While fuel nozzles are equipped with an automatic shut off, there is no substitute for having a human being at the nozzle and ready to shut off the flow of heating oil should there be an overfill or other mishap. DOE strictly enforces this requirement, therefore any violations should be reported to your local Conservation Officer.

Vent whistles are inexpensive and easy to install. Reputable plumbing and installation firms automatically include a vent whistle on any new heating oil tank installation. Discuss this with the firm that services your furnace.

Vent and filler pipes should be fitted with rain caps to prevent water from entering the tank; in the case of the vent pipe, a "U-fitting" is a better option. The vent pipe should be at least 12 inches higher than the filler pipe. Filler pipe caps should be affixed to the filler pipe with a hinged arrangement to prevent accidental loss of the cap. Most filler pipe caps can be locked to prevent tampering and/or theft of heating oil.

4.10 Drips and Ground Staining

Check for excessive ground staining. This may be a sign of chronic spillage from overfills (refer to Section 4.9 on vents and filler caps) or leakage from the tank. Check for drips. Leaking/dripping tanks and fittings should be repaired or replaced immediately. It should be noted that the owner of the building is responsible for cleaning up any contaminated soil around their heating oil tank. Furthermore, banks and other lending institutions generally require an environmental "clean bill of health" before they will finance the purchase of a home. In other words, leaving contaminated soil in place will make it difficult, if not impossible, to sell your home.

4.10 Excessive ground staining from a poorly installed and maintained oil tank.

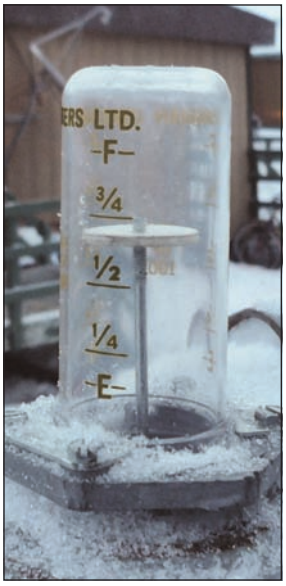
Prospective home buyers are strongly advised to conduct a thorough inspection of the area surrounding the heating oil tank for signs of past chronic oil spillage. This should be followed up with an inspection by a professional, such as a building inspector or engineer. Home insurance companies can provide advice on this.

4.11 Oil Level Gauge

Your heating oil tank should be fitted with an oil level gauge and it should be functional. The easiest way to test this is to look at the gauge over a period of weeks during the winter to see if the level indicator changes position. If it does not, then there may be a problem with the gauge. Broken and/or malfunctioning gauges should be repaired or replaced without delay.

For new installations or when replacing a gauge, the oil level gauge must – due its mechanical design – be installed while the tank is empty. One of the common causes of malfunctioning oil level gauges is that they were installed on a full tank of oil.

As gauges are subject to malfunctions of one form or another, it is strongly recommended that a vent whistle (refer to Section 4.9) be installed. One backs up the other.



4.11a Oil level gauge

Gauges should ideally be equipped with a gauge protector to prevent accidental damage from falling ice, vandalism and other accidents (Figure 4.11b).

4.11b Tank gauge protector (courtesy of Kerr Smart Energy – www.kerrsmartenergy.com)

4.12 Secondary Containment

The general purpose of a secondary containment structure – also referred to as a "containment berm" – is to prevent heating oil from escaping into the environment in the event of a minor or major failure of the enclosed heating oil tank. It also serves to contain nuisance leaks and minor spills.

The *National Fire Code of Canada* requires heating oil tanks with a capacity of greater than 2,500 litres (550 gallons) to have secondary containment. For this reason, and as a general rule of thumb, secondary containment structures are usually associated with large commercial buildings.

Secondary containment is not required for standard domestic 1,135 litre (250 gallon) home heating oil tanks. If in doubt, contact your local Conservation Officer or the Environmental Protection Division.

Containment berms should be kept clear of water, garbage and other debris. Most containment berms are fitted with a drain valve for the purpose of releasing accumulated water. The drain valve should be fitted with a lock or the spout should be fitted with a pipe plug or pipe cap to prevent tampering by vandals and children. Before draining accumulated water, ensure that it does not also contain heating oil.

4.12 4,550 litre (1000 gallon) tank with a concrete berm. Note that the drain valve is not fitted with a lock or chain and thus can be tampered with.

Where secondary containment is required, it must have a capacity of 110% of the volume of the enclosed heating oil tank. In other words, if your heating oil tank has a capacity of 3,000 litres, the secondary containment berm must have a capacity of 3,300 litres.

Secondary containment can also take the form of double-walled tanks. These will be discussed in detail in Section 5.3 of this Guide.

4.13 Tank Location

As indicated earlier, your heating oil tank should be located as close as possible to the heating appliance. The oil tank should also be located where it will not be subject to vehicular impact and/or any other related physical hazard. For example, in Nunavut, it is quite common to see a heating oil tank situated right next to the potable water fill pipes and/or sewage pump-out pipes. While the water delivery and sewage pump-out crew are generally careful when backing into spaces, all it takes is one slight bump from one of these large and extremely heavy vehicles to topple or crush a heating oil tank.

In some cases, it may not be possible to re-locate the heating oil tank, in which case, it should be protected by a solid and immovable physical barrier such as large boulders (of which there are plenty in Nunavut) or steel-concrete posts securely anchored into the ground.

In southern Canada, many home heating oil tanks are located indoors, usually in a dedicated room in the basement. This protects them from quite a few of the hazards described in this Guide, including external corrosion, ice, snow, vandalism, ground shifting, flowing water and vehicular impacts. Some regulatory agencies encourage homeowners to locate their heating oil tank indoors for these reasons. Finally, the fact that the heating oil is kept warm by being stored indoors, means that your furnace burns it more efficiently.

With a few exceptions, heating oil tanks in Nunavut are located outdoors, due to the fact that houses up here do not have basements and therefore indoor space is generally at a premium. Nevertheless, when it comes time to replace your heating oil tank, you may wish to consider re-locating it indoors if you have the available space. Before considering this option you should first ***consult a building inspector and the Office of the Fire Marshall as there are specific codes of practice related to the indoor installation of heating oil tanks***.

As a courtesy to your heating oil provider, pathways and steps leading to the tank should be kept clear of snow and debris. Ensure that the ladder and platform are solid. Make it as easy as possible for your heating oil provider to fill your tank. It is a good practice to have a chat with the delivery man every once in a while. You will be surprised what you can learn.

For a number of reasons including permafrost and building design, underground storage tanks have never been a common feature in Nunavut. It is, nevertheless worth noting that underground installations should not be considered and further, the Department of Environment would not allow such an installation unless there are exceptional circumstances for doing so; in which case stringent spill detection and prevention mechanisms would be required.

5 Replacing Your Heating Oil Tank: Some Options

Eventually, whether because of wear and tear, age, accidents, or as dictated by your insurance company at policy renewal time, your heating oil tank will have to be replaced. Currently, the replacement period, as far as insurance companies are concerned, appears to be about 10 years for a standard single-wall steel heating oil tank.

Once you have determined that it is time to replace your heating oil tank, there are several options available to you. Some, *but not all*, are discussed here.

5.1 Single-Wall Steel Heating Oil Tank

The least expensive option is to purchase a standard single-wall 1,135 litre (250 gallon) steel heating oil tank. As of 2011, the cost is approximately $1,300, landed at Iqaluit. The disadvantage is that, like your old heating oil tank, it will be subject to internal and external corrosion. As indicated at the beginning of this section, the life span of a standard 1,135 litre steel (250 gallon) heating oil tank, as dictated by many insurance companies, appears to be about 10 years, however, ***experience has shown that single-walled steel tanks have failed after as little as 2 years from the date of installation.***

Single-wall steel heating oil tanks for outdoor storage are prohibited in several jurisdictions in Canada including recently, in the Northwest Territories. While Nunavut is not currently considering such a ban, the Department of Environment strongly discourages their use and instead, recommends more robust tanks; some of which will be described in the following sections. There are already several installation firms who have indicated to DOE that they will no longer provide, nor install, single-wall steel tanks due to their inherent liabilities.

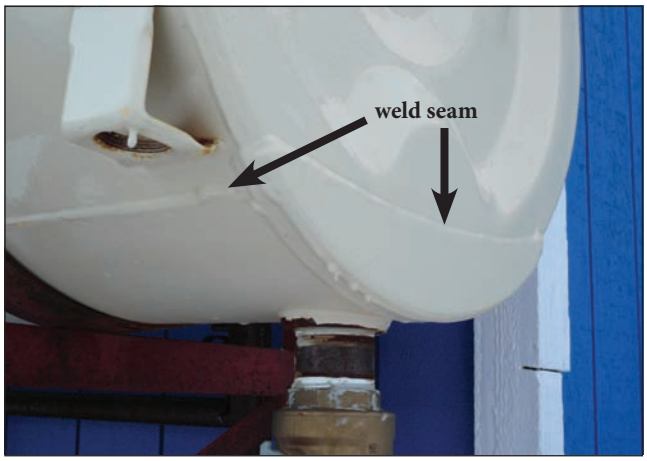
5.2 Single-Wall, Double-Bottom Steel Heating Oil Tank

Over the past few years, 1,135 litre (250 gallon) single-wall, double-bottom steel heating oil tanks have become very popular in Nunavut. Many public housing installations have largely replaced single-wall, steel tanks with double bottom tanks. Double bottom, epoxy-coated tanks provide excellent protection against the elements. As these tanks are not similarly coated on the inside, they are still subject to internal corrosion from accumulated water and sludge. Double bottom tanks provide a level of protection similar to that of a double-wall tank; though not as comprehensive. Unlike double wall tanks, double bottom tanks do not provide 110% secondary containment (as described in Section 4.11 and 5.3 of this Guide).

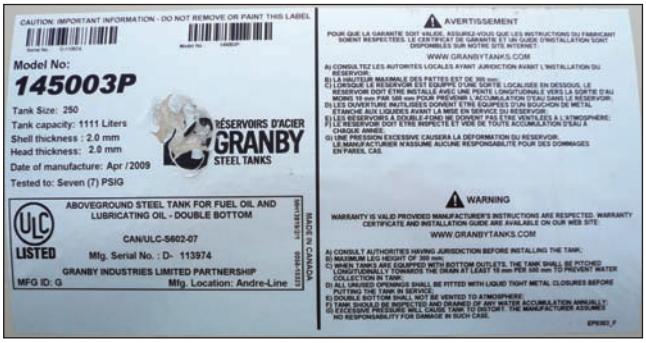
5.2 Single wall, double bottom steel heating oil tank.

Double bottom tanks are affixed with a sight glass at the top of the tank (Figure 5.2c). Inside the assembly is a colorimetric indicator, which if all is well, will show up as green. If the inner bottom of the tank springs a leak, the indicator will turn red which provides the homeowner with a warning that the tank needs to be replaced.

In the majority of cases, internal corrosion in steel tanks affects the very bottom of the tank, however, in the Northwest Territories, they have found that there have been a few cases where corrosion has occurred in the wall of the tank on or just above the weld seam of the double bottom. For this reason, the Government of the Northwest Territories has taken a cautious approach by pronouncing double bottom tanks as "unacceptable" for ***outdoor*** installations.



5.2a Double bottom tank. Note the weld seams on the front and sides of the tank showing the extent of the double bottom.



5.2b certification sticker for double-bottom tank.

5.2c Inspection port on a double-bottom tank. Note the green coloured indicator – this indicator will turn red if the inside bottom leaks.

Currently Nunavut accepts the use of double-bottom tanks with no plans to prohibit their use for outdoor installations. Nevertheless, it is strongly recommended that the prospective buyer discuss this issue with their installer, supplier or the manufacturer.

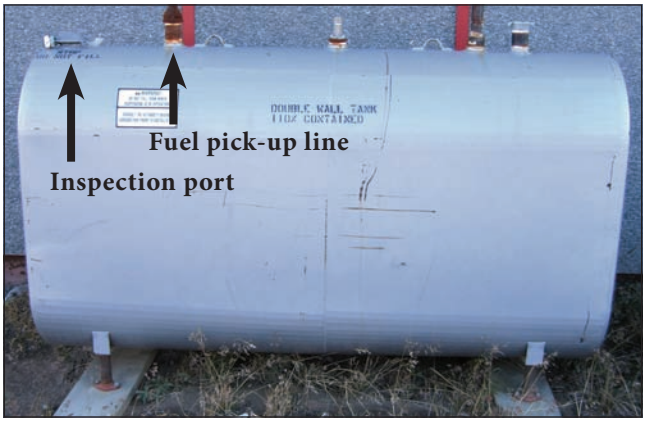
In terms of longevity, one manufacturer suggests a life span of 20 years for epoxy-coated, single-wall, double bottom tanks. As of 2011, these tanks cost roughly $1,700, landed at Iqaluit.

5.3 Double-Wall Steel Heating Oil Tank

One of the more expensive options is to purchase a 1,135 litre (250 gallon) double-wall steel heating oil tank (figure 5.3). A double-wall tank is essentially an oil tank within an oil tank, with an air space – also referred to as "interstitial space" – in between. If the inner tank, which holds the heating oil, springs a leak, the outer container will prevent the oil from escaping into the environment. Double-wall heating oil tanks are fitted with an inspection port that allows the homeowner to regularly monitor the interstitial space for signs of leakage. The installer can show you how to do this.

Double-wall tanks are sometimes referred to as "self-bermed" and therefore will, if the tank has a capacity of greater than 2,500 litres (550 gallons) (refer to Section 4.11), satisfy the requirement for secondary containment. Most double-wall steel tanks provide for 110% containment and in most cases, this will be verified by a stencil on the tank (Refer to Illustration 5.3). Prospective buyers should confirm this before purchasing a double-wall steel tank.

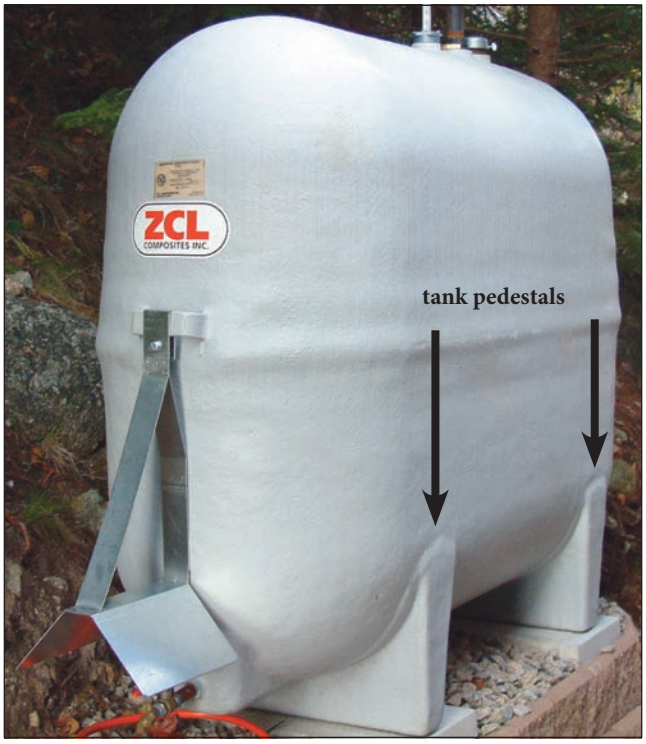
Like other steel heating oil tanks, double-wall (steel) oil tanks are still subject to internal corrosion and therefore must be drained of accumulated water twice per year.



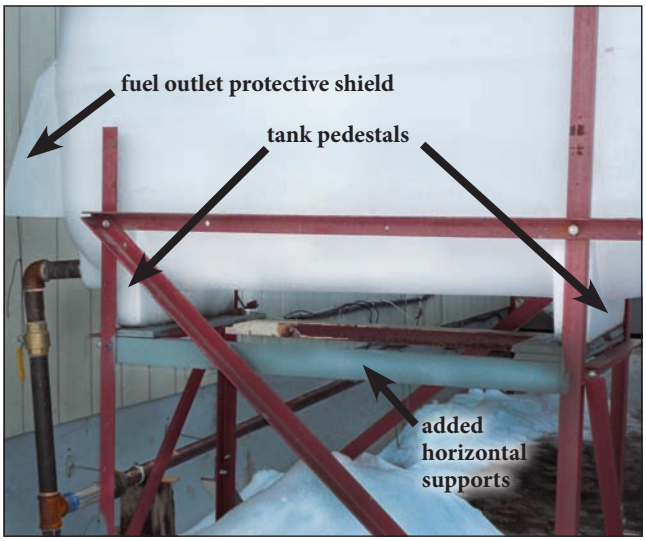
5.3 Double-wall 1,135 litre (250 gallon) steel heating oil tank. Note the inspection port on the top left end of the fuel tank.

5.3b Inspection port on a double-wall fibreglass tank

Double-wall heating oil tanks have an estimated life span of greater than 20 years; however, it is recommended that you consult your insurance company and your local installer for specific information. Double-wall heating oil tanks are somewhat pricey: as of 2011, they cost about $3,500, landed at Iqaluit. Considering their inherent safety features, coupled with their relatively long life span, they present an attractive option for the homeowner who is contemplating replacing his heating oil tank.



5.4 Fibreglass, 1,135 litre (250 gallon) single-wall heating oil tank. Note the protective shield over the fuel outlet valve. (Photo courtesy of ZCL Composites, Edmonton, AB.)



5.4b Modifications made to a standard steel heating oil tank to accommodate a fibreglass tank. The metal saddle bands have been removed and replaced with horizontal steel members (grey metal) on which the pedestals of the fiberglass tank rests.

5.4 Fibreglass Heating Oil Tank

Fibreglass heating oil tanks are relatively new on the market but are becoming increasingly popular in the south and particularly in the Maritime provinces where the salt water environment tends to accelerate corrosion in steel tanks. Their greatest advantage is that they are not subject to rust and corrosion and therefore will last for a very long time. The Canadian manufacturer consulted for this Guide offers a 30-year, 5 million dollar limited warranty on all of their fibreglass heating oil tanks.

Fibreglass heating oil tanks are lightweight: 90 kg (190 lbs) for a single-wall 1,135 litre (250 gallons) tank and, according to the manufacturer, they are also fire resistant. These tanks are available in single- and double-wall configurations. With respect to the latter, the manufacturer consulted for this Guide suggests that for domestic applications – home heating oil tanks – a single-wall fibreglass tank is all that is required; furthermore, it is less expensive than a double-wall tank. The need for a double-wall tank in the first place relates primarily to steel tanks where corrosion is an issue. Corrosion is not an issue for fibreglass tanks.

As of 2011, a 1,135 litre (250 gallon) single-wall fibreglass heating oil tank, landed at Ottawa, Ontario sells for approximately $1,700; $2,400 for a double-wall fibreglass tank. Note that these prices do not include the cost of shipping to Nunavut.

Fibreglass tanks are affixed with built-in pedestals (refer to photo 5.4) and which are intended to take the weight of a fully-loaded tank. These tanks are designed to rest directly on a flat surface – usually a prepared ground pad – on their pedestals. In Nunavut, most tanks must be located on an elevated base – usually a tank stand – to ensure proper gravity-assisted fuel flow. Standard steel tank stands are fitted with saddles – u-shaped metal bands – which take the weight of the tank on the curved underside of the tank body. Fibreglass tanks should not be installed in this manner. ***The weight of a fibreglass tank must rest on the built-in pedestals and not on the body of the tank***. This usually requires that the homeowner make modifications to the existing tank stand.

The NWT Housing Corporation has developed a set of engineered drawings on how to modify an existing steel tank stand to accommodate a fibreglass tank. These drawings can be found on the Department of Environment website:

http://env.gov.nu.ca/programareas/environmentprotection/legislation

Fibreglass heating oil tanks have many features that make them an attractive option for anyone contemplating the purchase of a new oil tank.

While fibreglass heating oil tanks are not subject to internal corrosion, they should, nevertheless, be drained of accumulated sludge and water with the same frequency – twice per year – as steel tanks. This is because water and sludge can still get into the metal fuel line (and drip leg), freeze and burst the line. It is also a good practice to prevent exessive accumulation of water and sludge as this can have negative impacts on the heating system.

5.5 Used/Second-Hand Heating Oil Tanks

It may be tempting to purchase that used/second-hand heating oil tank that a friend has sitting in his shed and which he is willing to sell to you for a few hundred dollars. You might save a few thousand dollars in the short-term, but is the long-term risk really worth it?

It is difficult to assess the physical condition of a second-hand heating oil tank and in particular, the degree and extent of internal corrosion or material fatigue. A second-hand heating oil tank may last for years or it may rupture the day after it is installed. The cost of purchasing a brand-new heating oil tank – where you can be assured of its structural integrity – is far less than what it would cost to clean up an oil spill from what may turn out to be a defective second-hand heating oil tank. Furthermore, your insurance company may refuse to renew your homeowner's policy if you have replaced your old heating oil tank with a second-hand heating oil tank. Finally, if all of the above has not convinced you, be aware that it is a breach of Code to install second-hand heating oil tanks. No reputable installer will install a second-hand heating oil tank.

5.6 Which Option Should I Choose?

This will be dependent upon your budget, your best judgement and advice from your oil burner or boiler mechanic. Considering the high cost of cleaning up an oil spill in Nunavut, homeowners are advised to place a high priority on quality.

Each option has its own pros and cons. There are many other options out there that have not been covered by this Guide. It is not the purpose of this Guide to provide a detailed examination of the different types of heating oil tanks, of which there are many, only to advise the homeowner about a few of the more common options available to them. The examples provided in this Guide are what is most often found in Nunavut. It is suggested that the homeowner do his own research – the internet is a useful tool for this – and discuss those options with his local installer.

6 Other Considerations

6.1 Thermal Expansion

Heating oil will expand and contract with changes in temperature. Homeowners should therefore pay particular attention to their heating oil tank during the spring season, when temperatures tend to fluctuate dramatically from one day to the next and sometimes over a period of hours.

What happens is this: the heating oil provider may fill up your heating oil tank to capacity on a cold spring day. The next day, the temperature might increase by several degrees. This temperature increase causes the oil in the tank to expand. In some cases, the oil in the tank may expand to the point where it has nowhere to go but through the top of the filler pipe, spilling onto the ground. The amounts spilled are not especially great: in the order of a few litres, however, if this goes on for several days per year; year after year, it all adds up. This is a needless waste of an expensive and finite resource and further results in environmental cleanup costs to the homeowner.

The best way to avoid this problem is to take steps to ensure that there is ample headspace between the oil and the top of the tank. Vent whistles are useful devices for ensuring that an adequate headspace is maintained, thus allowing room for the oil to expand (refer to Section 4.9). Most oil delivery companies should be aware of this, however, it is a good idea to remind them.

6.2 Bottom Feed vs. End-Wall Feed

Up until very recently, most heating oil tanks have been configured such that the fuel outlet is located at the

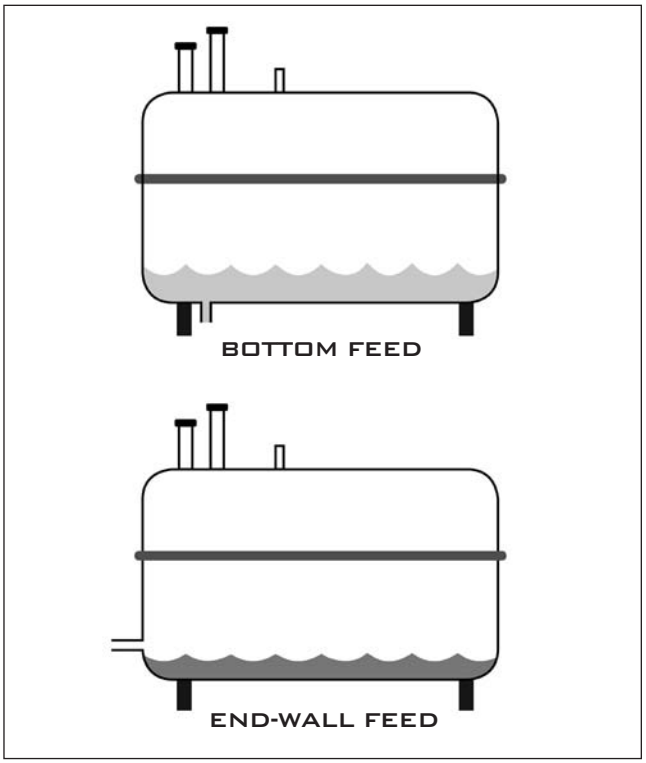
6.2a End-wall feed configuration

6.2b Bottom-feed configuration

bottom of the end wall of the tank. The drawback to this configuration is that outlet is not on the very bottom of the tank but approximately one inch above the bottom of the tank, thus creating a condition for water and sludge to accumulate, even when the drip leg is regularly drained.

Bottom feed systems were introduced to eliminate this condition. In a bottom-fed system, the fuel outlet is located on the underside of the heating oil tank. The rationale for a bottom-fed fuel line is that water and sludge will not accumulate in the tank at all, but will instead be immediately flushed through the fuel lines and into heating system; thus avoiding internal corrosion (refer to illustration 6.2).

The disadvantage to this configuration is that excessive amounts of water and sludge can collect and freeze in



6.2 Bottom feed vs. end-wall feed

the fuel line and shut down the heating appliance; this is especially true for narrow diameter (1 inch and less) fuel lines. Finally, water and sludge do have the potential to cause damage to the heating appliance if it overwhelms the in-line filtration systems.

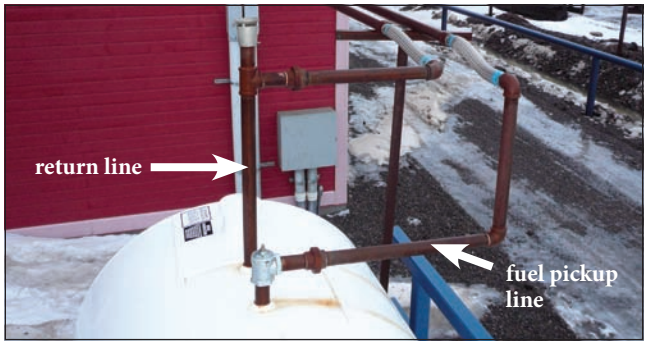
In some jurisdictions in Canada, installers are returning to the end-wall fed configuration to avoid frozen fuel lines and other associated problems.

Even with a bottom feed system as described above, there is still a need to monitor and remove sludge and water (from the drip leg) on a regular basis.

Before ordering a new tank, discuss this issue with your installer.

6.3 Gravity-Assisted Feed vs. Suction Feed

The on-board fuel pump on a standard burner motor can, depending upon the diameter of the fuel line, lift oil to a height of up to ten vertical feet. Since homes and buildings in Nunavut have to be elevated well above ground level – sometimes at a considerable height – to avoid melting the underlying permafrost, this can create a situation where the on-board fuel pump is unable to draw the fuel from the tank and into the system. In order to facilitate proper fuel flow, heating oil tanks in Nunavut have traditionally



6.3a Commercial double-wall steel heating oil tank showing the pickup and return fuel lines.

been placed on elevated platforms – tank stands – to provide gravity assistance in getting the fuel to the appliance. Most domestic oil-heat systems in Nunavut are gravity-assisted.

On some tank installations – primarily double walled tanks on commercial buildings – the heating oil is suctioned through the top of the oil tank via a fuel pick-up line that extends to just a few inches above the bottom of the heating oil tank. This requires that a large, powerful suction pump be installed in the building's mechanical room to draw the oil from the tank. The advantage to this system is that if the exterior/outside section of the fuel line suffers a break or rupture, the contents of the heating oil tank will not empty onto the ground, as it would with a gravity-assisted system.

On some systems, however, usually for large, commercial boilers, fuel is fed to the appliance via a loop which is comprised of a suction line and a return line. This is to ensure a continuous flow of fuel to the appliance; with any unused/excess fuel being returned directly back to the main heating oil tank. In such a system, if the return line is broken, the fuel pump will continue to suction fuel out of the tank, pumping out of the broken return line, until the tank is empty. For such installations, extra care must be taken to protect the external fuel lines from any physical insults. There are a number of clever safety features which can be installed to prevent such accidents, however, a detailed description of these systems is beyond the scope of this Guide.

One of the primary advantages offered by suction-fed systems is that the fuel tank can be located directly on the ground on a prepared pad, thus avoiding many of the problems associated with heating oil tank stands. Homeowners should first seek advice and technical information from a professional oil burner or boiler mechanic or plumber if they are considering systems as described above.

6.4 Insurance

Insurance companies may or may not cover the costs associated with heating oil tank spills. Those that do may cover only limited amounts such as any costs associated with cleaning up adjacent properties. ***Insurance companies may refuse any payment whatsoever if it can be demonstrated that the spill was entirely preventable had the homeowner taken appropriate precautions and followed a routine of regular inspections and maintainence***. Homeowners are strongly encouraged to consult their insurance company to see exactly what their policy covers and what their obligations are in terms of personal responsibilities and liability.

7 Reporting Spills

Heating oil spills of 100 litres (20 gallons) or more must be reported to the Northwest Territories/Nunavut (NT-NU) 24-Hour Spill Report Line*. There are two ways to do this:

1. Call (867) 920-8130 and report the spill. ***Collect calls are accepted***. The person at the other end of the line will ask you a few questions including your name, address, telephone number, where the spill occurred and how much was spilled.

2. Alternatively, the spill report form attached to this Guide can be filled out and faxed to the spill line at (867) 873-6924. Interactive spill report forms are also available electronically and can be filled out on your computer, printed and faxed, or e-mailed to the spill line. Interactive electronic spill report forms are available upon request or can be downloaded from DOE's website at: www.gov.nu.ca/env/applications.html.

* While heating oil spills of less than 100 litres are not *reportable*, all spills of hazardous materials, including heating oil, must be cleaned up regardless of the quantity involved.

8 Conclusion

Over the past several years, DOE environmental inspectors have seen a marked increase in spills from domestic heating oil tanks and have further had the unenviable task of informing the homeowner that they are legally responsible for cleaning up the spill, with the

full knowledge that the cost for such cleanups will, more often than not, result in serious financial hardship for the homeowner.

It is hoped that the release of this Guide will result in a significant decrease in the number and volume of spills from home heating oil tanks and consequently, serve to protect the environment and further, prevent financial hardship for homeowners.

This Guide should be considered as a work in progress. Any suggestions for improvements and/or questions are encouraged and should be directed to:

Chief Environmental Protection Officer
Department of Environment
Government of Nunavut
Bag 1000, Station 1360
Iqaluit, Nunavut X0A 0H0
(867) 975-7700
EnvironmentalProtection@gov.nu.ca

9 References

Canadian Council of Ministers of the Environment. *Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.* 2003.

Senior Flexonics Canada. Flexible Metal Hose Assemblies. www.flexonics.ca

Government of Newfoundland and Labrador. *Heating Oil Storage Tank System Regulations.* 2003.

Government of Nova Scotia, Environment and Labour. *Homeowners Guide to Heating Oil Tank Systems.*

Government of Nova Scotia, Environment and Labour. *Tank System Accessories.*
www.gov.ns.ca/enla/petroleum/accessories.asp

Government of the Northwest Territories, Environment and Natural Resources. *Homeowner's Guide to Oil Tanks.*

Government of Nova Scotia, Environment and Labour. *Installation and Environmental Management Guide for Aboveground Domestic Oil Tanks in Nova Scotia. March 2007.*

Government of Prince Edward Island, Fisheries, Aquaculture and Environment. *Home Heat Tank Safety, What You Should Know About Your Home Heat Tank.*

State of Alaska. Department of Environmental Conservation. Prevention and Emergency Response Program. *Alaska Heating Oil Tanks.* January 2003.

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The Home Construction & Information Website. Building & Environmental Inspection, Testing, Diagnosis, Repair, & Problem Prevention Advice. *Heating Oil Underground & Aboveground Oil Storage Tank Leaks, Testing, Problems & Solutions, Home Buyer's / Home Owner's Guide.* 2007.
www.inspect-ny.com/oiltanks/tanks.htm

10 Legislation, Codes and Standards

Legislation

Government of Nunavut

- *Environmental Protection Act*
- *Environmental Protection Act: A Simplified Summary*
- *Spill Contingency Planning and Reporting Regulations*
- *A Guide to the Spill Contingency Planning and Reporting Regulations*
- *Environmental Guideline for Site Remediation (2010)*
- *A Property Owner's Guide to Contaminated Site Remediation in Nunavut*
- *Environmental Guideline for the General Management of Hazardous Waste (2010)*

The above is available for viewing at the following website:

http://env.gov.nu.ca/programareas/environmentprotection

or if you wish to obtain hard copies and do not have Internet access, by contacting your local Conservation Officer or by contacting the Department of Environment, Iqaluit (867) 975-7700.

Government of Canada

Petroleum and Allied Petroleum Products Storage Tanks Regulations.

www.ec.gc.ca/rs-st

Legislation came into force on June 12, 2008. This does not affect private homeowners (unless they are situated on federal land), however, the legislation contains useful spill prevention information.

Codes

- *National Fire Code of Canada 2005*
- *National Building Code of Canada 2005*

Unfortunately, the above Codes cannot be accessed via the Internet but must be purchased from the National Research Council Canada in Ottawa. Their website address is:

https://commerce-irc.nrc-cnrc.gc.ca/b2c/b2c/init.do

The site provides a list of Canadian Codes and Guides which can be purchased online.

Standards

Underwriters' Laboratory of Canada Publications:

- National Standard of Canada. CAN/ULC-S602, *Above Ground Steel Tanks for the Storage of Combustible Liquids Intended to Be Used as Heating and/or Generator Fuels.*

www.orderline.com/detail.asp?group=448

- *Underwriters' Laboratories of Canada. ULC/ORD C80, Aboveground Non-Metallic Tanks For Fuel Oil*

www.orderline.com/detail.asp?group=338

Canadian Standards Association (CSA):

- Canadian Standards Association, *Installation Code for Oil Burning Equipment (CSA B-139-09)*

www.csa.ca/products/energy/Default.asp?articleID=4414&language=english

Office of the Fire Marshall

Department of Community and Government Services, Government of Nunavut

PROTECTION SERVICES
P.O. Box 1000, Station 700 (4th Floor, Brown Building)
Iqaluit, NU X0A 0H0

Fire Marshall……..867-975-5310

Canadian Oil Heat Association

The Canadian Oil Heat Association was established in 1983. COHA is a national body with a membership of over 400 oil heat professionals, including fuel oil dealers, major oil companies, manufacturers, wholesalers, contractors, trainers and other professionals.

A voluntary membership organization, COHA serves as the industry's voice to provincial and federal regulators and government decision makers on matters of policy, safety, and certification. COHA works with government and other stakeholders to foster a sustainable business environment for its members.

As a national organization, COHA is comprised of provincial chapters in Ontario, Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland & Labrador focusing on provincial regulatory, training, and promotion activities.

In addition to their own staff and technical resources, COHA relies on its member volunteers serving on various committees and ad hoc groups to bring first-hand industry knowledge and experience to the table when developing new strategies and solutions.

COHA's GreenTECH™ program was created to promote professionalism, proficiency and consumer trust in the oil burner and boiler mechanics trade. COHA issues GreenTECH™ certificates of qualification to oil burner or boiler mechanics who have the required amount of relevant field experience, have completed specified courses of study and have further achieved a passing grade on examinations designed to test competence in the required skill areas. Certified technicians are considered to be experts in residential oil-fired equipment. The GreenTECH™ program is recognized by the oil heat industry and increasing numbers of homeowners, regulators and insurance carriers. For further information on the GreenTECH program and other programs sponsored by the Canadian Oil Heat Association they can be reached at:

115 Apple Creek Blvd. Suite 202
Markham, ON
1-800-257-1593
oilheat@coha.ca

Appendix

NT/NU Spill Report Form and Guide

Northwest Territories | Nunavut | Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR	REPORT NUMBER ____-____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME	☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call to the spill line. Forms can also be printed and faxed to the spill line at 867-873-6924. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. **Please do not fill in the Report Number**: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. **You must include the geographic coordinates** (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. **Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.**
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overfill, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m^2)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or environment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. **Please number the pages to ensure that recipients can be certain that they received all pertinent documents.** If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	**Leave Blank**. This box is for the **Spill Line's use only**.

Government of Nunavut
Department of Environment
Environmental Protection Division