

ENVIRONMENTAL Fact Sheet



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WMD-REM-16

2004

Best Management Practices for the Installation and Upgrading of On-Premise-Use Heating Oil Tank Facilities

All owners of on-premise-use facilities (OPUFs) should take measures to bring their facilities into compliance with the requirements of RSA 146-E:4 and the New Hampshire Department of Environmental Services (DES) best management practices (BMPs). Failure to achieve compliance could preclude future eligibility and access to the New Hampshire Petroleum Reimbursement Cleanup Funds should a release occur. Be advised that DES refers to an OPUF as only that portion of a heating oil system from the fill pipe to the point where the supply line connects to the burner. This includes the fill and vent pipes, the tank with its supports and foundation, appurtenances connected to the tank, and any and all supply and return piping.

RSA 146-E:4 requires that these facilities comply with the provisions of the National Fire Protection Association standard NFPA 31 "Installation of Oil-Burning Equipment." The primary guidance document for such facilities remains NFPA 31. These BMPs augment that standard by further detailing specific requirements such as tank foundations, protective sleeves for supply lines, and outdoor tank locations. Other requirements listed in this document are simply a reiteration of the NFPA 31 standards which DES believes are important in preventing oil releases to the environment.

APPLICABILITY

Facilities that are subject to these requirements are those heating oil storage tank systems that are **used solely for heating the building on the property where the tank is located**. They include both aboveground and underground tanks that are not regulated by either Administrative Rule Env-Wm 1402 "Control of Aboveground Petroleum Storage Facilities" or Administrative Rule Env-Wm 1401 "Underground Storage Facilities." The majority of these tanks are the familiar 275-gallon tank that often serve residential heating needs but may also include smaller tanks which supply oil to kerosene heaters as well as non-residential applications that are not covered by either of the administrative rules listed above. If there is any question on the applicability of a particular system, please contact DES at 271-3644.

TANK FABRICATION & STANDARDS

Heating oil storage tanks that are covered by these BMPs shall follow the minimum design and fabrication standards of NFPA 31, which requires tanks be built in accordance with the following:

(a) Underwriters Laboratories, Inc. UL 142, Standards for Steel Aboveground tanks for Flammable and Combustible Liquids; UL 58, Standard for Steel Underground Tanks for Flammable and Combustible Liquids; UL 80, Standard for Steel Inside Tanks for Oil Burner Fuel; UL 1316, Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products.

(b) American Petroleum Institute, Standard API 650, Specifications for Welded Steel Tanks for Oil Storage.

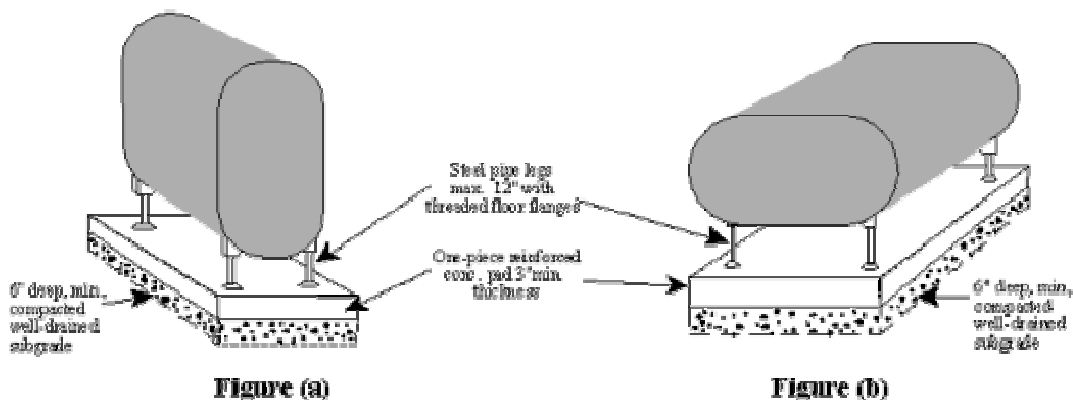
(c) American Society for Testing and Materials, ASTM D 4021, Standard Specification for Glass-Fiber Reinforced Polyester Underground Petroleum Storage Tanks.

OUTSIDE TANKS - 660 GALLONS or Less

Tanks located outdoors, such as those at manufactured housing parks, account for a large portion of OPUFs in New Hampshire. Because of constant exposure to weather and the elements, special considerations are required to prevent system failure and subsequent releases. Because of the annual freezing and thawing of the soil in New Hampshire, an adequate foundation and support system is critical.

LEGS AND FOUNDATIONS: Tanks of either upright (vertical) or horizontal configuration shall be mounted on steel pipe legs not exceeding 12 inches in height and fitted with threaded floor flanges at the base of each leg. The legs shall rest on a minimum 3-inch thick reinforced concrete pad. The length and width of the pad shall be equal to or larger than the dimensions of the tank. The pad shall rest on a bed (6" minimum) of compacted well-drained gravel, crushed stone, coarse sand or other acceptable subgrade. See figures (a) and (b) below.

With either vertical or horizontal tanks, the leg brackets that are welded to the bottom of a tank shall not be used as a leg and shall not rest directly on the concrete pad. Some tanks, such as UL 142 tanks, are designed and manufactured to be supported by cradles, saddles or other similar supports. These supports shall be placed on concrete pads as described above. In all cases, there shall be a minimum of 4 inches of clearance from the bottom of the tank to any other surface.



OUTDOOR TANK LOCATION: Physical damage to tanks and lines from snow or ice falling from overhead roofs results in many sizable releases of oil each year. Outside tanks and piping

shall be located such that their exposure to damage from falling snow or ice is minimized. To meet this requirement, the facility shall be:

- a. Located at the gable end of a building, or
- b. Fully covered by a sturdy, well constructed roof, or
- c. Located so that the tank and any unsupported piping is not located within 18 inches of the drip line of the eaves.
- d. Filters located outside and unprotected from the elements are not permitted.

Other considerations to minimize the risk of physical damage to the tank and associated components shall be taken into account when locating an outdoor tank. These may include overhanging tree limbs, high foot traffic areas, and snow storage areas from plowing. See fact sheet WMD-OIL-10 for more information on proper outdoor tank location.

INSIDE TANKS - 660 GALLONS or LESS

Although tanks and piping located within a building are not subject to the exposure that outdoor tanks are; provisions must be made in order to minimize the risk of an oil release.

LEGS AND FOUNDATIONS: Whenever possible, a tank (either vertical or horizontal) shall be located on a concrete floor. Tank legs shall not exceed 12 inches in height and shall be equipped with threaded floor flanges. Saddles, cradles or other supports designed specifically for a tank can be used. Tanks located inside a building **without** a finished concrete floor shall be supported on legs not exceeding 12 inches and fitted with threaded floor flanges. The legs shall rest on a minimum 3-inch thick reinforced concrete pad. The length and width of the pad shall be equal to or larger than the dimensions of the tank. The pad shall rest on a bed (6" minimum) of compacted well-drained gravel, crushed stone, coarse sand or other acceptable subgrade. (See figures (a) and (b) - Page 2).

OIL SUPPLY and RETURN PIPING

Many oil releases from OPUFs originate from supply and/or return lines. This is especially true for those unprotected lines that are located within or under a concrete floor, buried underground or otherwise located in a corrosive environment. State of New Hampshire fire code Saf-C 6012.02(b) states: "Whenever an oil supply or return line is installed under concrete, sub-floors, or earth surfaces, the line shall be continuous from the burner to the tank and not contain any splices." Additionally, NFPA 31 states: "all buried piping shall be protected against corrosion."

All oil supply and return lines installed under or within concrete floors, under sub-flooring or buried by any description of soil shall be fully encased in a non-metallic, liquid tight conduit such as PVC, ABS or other similar material. Supply and return lines which are above grade but which are covered with mortar shall be considered buried and are also required to be encased in such a sleeve or conduit.

Lines that penetrate a foundation wall shall be encased in a non-metallic, liquid-tight conduit such as PVC, ABS or other acceptable material. The opening of the conduit should be sealed at the wall to prevent the entry of water, insects, rodents, etc. The use of plastic or vinyl coated copper supply (and return) lines are required for all outdoor applications and strongly encouraged for all installations.

VENT LINES AND VENT ALARMS

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VENTS: All tanks must be equipped with proper atmospheric venting. Indoor tanks shall be equipped with vent pipes that terminate outside the building. Inside and outside tanks with a capacity of 660-gallons or less shall have a vent with a minimum inside diameter of 1 1/4 inches. Underground tanks with a capacity of 66-gallons or less also require a vent with a minimum inside diameter of 1 1/4 inches. (Note: NFPA requires that when underground tanks are filled by the use of a pump through tight connections, a vent pipe not smaller in size than the discharge to the pump should be used.)

VENT ALARMS and GAUGES: All tanks shall be equipped with a method of determining the oil level in the tank. As a minimum, an audible vent whistle alarm shall be present on all tanks (above ground and underground). Such a device is used to signify that the predetermined safe fill volume of a tank has been reached during a delivery. Aboveground tanks shall also be equipped with a sight gauge to indicate the liquid level in the tank at any given time. Underground tanks shall be accessible such that a gauge stick can be used to determine the liquid level. The use of electronic liquid level gauges and overfill prevention alarms is also acceptable and encouraged where possible.

ABANDONMENT OF TANKS AND RELATED EQUIPMENT

NFPA 31, section 2-8 states, and these BMPs reiterate: "If a tank and its related piping is abandoned for whatever reason, the tank and all piping connected to it, including the outside fill and vent piping and any piping connected to the appliance, shall be emptied of all contents, cleaned, removed from the premises or property, and disposed of in accordance with all applicable local, state, and federal rules and regulations." The DES Waste Management Division can be contacted to obtain the requirements and available options for the proper disposal of tanks and associated piping.

ADDITIONAL INFORMATION

Keep in mind that DES refers to an OPUF system as those portions of a fuel oil heating system from the fill pipe to the point where the supply line connects to the burner. There are many additional aspects and components of heating systems that are not covered in these BMPs. NFPA 31 remains the document of standard for the installation of oil-burning equipment in New Hampshire and should be used in conjunction with these BMPs for all new installations and system upgrades.

In order to meet the upgrade requirements, financial assistance is available to those owners who demonstrate financial need. Refer to fact sheet WMD-REM-17 for information on the SAFETANK program.

Please contact the OPUF Release Prevention Coordinator in DES's Waste Management Division at (603) 271-3644 for additional information.

Disclaimer: Information contained in this Fact Sheet is current as of January 1, 2004. Statutory or regulatory changes that may occur after that date may cause part or all of the information to become invalid. If there are any questions concerning the current status of information, please contact DES at (603) 271-3644.

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