

ABOVEGROUND PETROLEUM STORAGE TANKS

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu>)

INTRODUCTION

Aboveground storage tanks (ASTs) are used to store petroleum products at several UNL locations. For example, ASTs may be used to store fuels for stationary engines (e.g., irrigation pumps, building heaters, grain dryers, emergency generators, etc.) or motor vehicles (i.e., cars, pickups, farm machinery, etc.). Sometimes ASTs are used to store used oil. The purpose of this SOP is to provide a summary of regulatory requirements for storage of petroleum products in ASTs.

This SOP is limited to ASTs that are greater than 60 gallons in size. This SOP is limited to ASTs that are used to store petroleum products, and does not address ASTs used to store hazardous substances. This SOP is limited to regulations promulgated by the United States Environmental Protection Agency (EPA), the Nebraska Department of Environmental Quality (NDEQ), and the Nebraska State Fire Marshal (SFM). This SOP does not address other fuel regulations promulgated by other agencies (e.g., Department of Revenue taxation and labeling regulations, etc.).

REGULATORY AUTHORITIES

A summary of applicable EPA, SFM, and NDEQ regulatory requirements follows.

- EPA's Spill Prevention Control and Countermeasures (SPCC) regulations apply to all oil storage ASTs that are 55 gallons or greater in size; **and** which are located at a site that is subject to SPCC requirements because the aggregate quantity of oil stored exceeds the regulatory threshold. At UNL, SPCC regulations apply to ASTs located on City and East Campuses.
- Nebraska Title 153, administered by the SFM, incorporates by reference AST-related National Fire Protection Association (NFPA) codes and standards, which specify requirements for the design, installation, and operation of AST systems. Title 153 establishes tank installation permit requirements. Title 153 incorporates the following AST-related NFPA Codes, NFPA 395, 1993 ed., Standard for the Storage of Flammable and Combustible Liquids at Farms and Isolated Sites; NFPA 30, 2000 ed., Flammable and Combustible Liquid Code; NFPA 30A, 2000 ed., Code for Motor Fuel Dispensing Facilities and Repair Garages; NFPA 31, 2001 ed., Installation of Oil-Burning Equipment; NFPA 37, 2002 ed., Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.
- NDEQ regulations require reporting of certain releases of petroleum to the environment (Nebraska Title 126, *Rules and Regulations Pertaining to the Management of Wastes*; Chapter 18, Releases of Oil or Hazardous Substances) and provide financial assistance for eligible cleanup expenses resulting from petroleum

releases from tanks (Nebraska Title 200, *Rules and Regulations for Petroleum Release Remediation Action Reimbursement Fund*). NDEQ also imposes certain management standards for ASTs used to store used oil pursuant to Nebraska Title 128, *Nebraska Hazardous Waste Regulations* (e.g., good condition and labeled with the words “Used Oil” if 25 gallons or greater in size).

TYPES OF ABOVEGROUND STORAGE TANKS

NDEQ’s petroleum release regulations and EPA’s SPCC regulations do not distinguish between various types of ASTs. However, the SFM applies different regulations to ASTs depending on use of the tank. In general terms (and in consideration of the various uses for petroleum ASTs at UNL), the SFM classifies an AST as one of the following:

- Farm tank.
- AST used at a motor fuel dispensing facility.
- AST used to hold fuel for oil-burning equipment.
- AST used to hold fuel for a stationary combustion engine.
- Other AST.

Farm Tanks (or ASTs Located at Isolated Sites)

SFM regulations for these types of ASTs are the least stringent. However, applicability is limited to those ASTs that are:

- 1100 gallons or less in size.
- Located on farms and in rural areas, or at isolated construction and earth-moving project sites.

A farm tank designation is not applicable to any AST, regardless of location, which is used to store fuel for oil-burning equipment/appliances (i.e., heaters, boilers, etc.) or stationary combustion engines (i.e., irrigation pumps, grain dryers, emergency generators, etc.). In general, the farm tank designation is appropriate for motor vehicle fuel ASTs located at remote areas associated with UNL Research and Extension Centers. The SFM regulates these ASTs pursuant to NFPA 395.

Motor Fuel Dispensing

This classification encompasses UNL’s fleet fueling operations, the most obvious example of which is the Transportation Services sites on the Lincoln campuses. Similar operations at other UNL facilities that can not qualify for the farm tank designation (e.g., exceed the 1100 gallon size limit, located in an urban area, etc.) would also be regulated as motor fuel dispensing facilities. The SFM regulates these ASTs in accordance with NFPA 30A.

Oil-Burning Equipment

This classification includes ASTs that are physically connected to oil-burning equipment and appliances, including but not limited to industrial-, commercial-, and residential-type steam, hot water, or warm air heating plants; domestic-type range burners and space heaters; and portable oil-burning equipment. The designation of “oil-burning equipment” does not apply to internal combustion engines, oil lamps, or most portable devices. The SFM regulates these ASTs in accordance with NFPA 31.

Special EPA and NDEQ regulations apply to burning of used oil in heaters and similar devices. This activity may be regulated under clean air and waste management regulations. Consult EHS before burning any used oil.

Stationary Combustion Engine

This classification includes ASTs that are physically connected to combustion engines, such as irrigation pumps, grain dryers, emergency generators, etc. The SFM regulates these ASTs in accordance with NFPA 37.

Other

ASTs that are not regulated pursuant to any of the NFPA Codes listed above would, by default, be regulated in accordance with NFPA 30. An example is a used oil tank that does not qualify as a farm tank.

The above discussion is somewhat oversimplified, since the SFM will also apply portions of NFPA 30 to specific types of ASTs (e.g., stationary combustion or oil-burning equipment ASTs).

TANK INSTALLATION PERMIT

An Installation Permit must be obtained from the SFM prior to installing any new or replacement AST that is greater than 60 gallons in size, other than a farm tank. This includes relocating an AST from one location to another.

Contact EHS well in advance of the intended date of installation. While the contractor will usually complete and submit the permit application, EHS must be notified because of other potential regulatory implications (e.g., EPA's SPCC regulations). The application must be submitted to the SFM a minimum of 10 working days prior to the intended install date. If the information in the application is consistent with regulatory requirements, the SFM will issue an installation permit. The permit will contain detailed conditions for installation and operation, all of which must be observed. The SFM will generally conduct a post-installation inspection. If any lines will be buried, the SFM will conduct an inspection prior to burial of the lines (which is in addition to the final installation inspection).

Registration of petroleum storage ASTs with the SFM is not required. Registration is required only for hazardous substance storage ASTs.

SFM TANK DESIGN/LOCATION REQUIREMENTS

Farm Tanks

Farm tanks have the least stringent design requirements. Minimum design/location standards for farm tanks include the following:

- Maximum capacity of 1100 gallons.
- Non-combustible construction (e.g., steel- 14 gauge for tanks up to 560 gallons; 12 gauge for tanks from 561-1100 gallons).

- Riveted and caulked, riveted and welded, or welded joints.
- Single compartment design.
- Separate fill (must be lockable) and vent (minimum of 2" for tanks up to 300 gallons; 3" for tanks 301-1100 gallons) openings.
- Mounted on timbers, blocks, or supports to prevent corrosion to the bottom of the tank.
- If equipped with a pump, the pump must be an approved pump and permanently attached to the AST.
- Equipped such that the dispenser nozzle and approved hose can be padlocked to its hanger.
- Equipped with a self-closing nozzle on the discharge hose or an anti-siphoning device.
- Equipped with a fire valve at the connection of the hose to the tank.
- Located at least 40' from any building, haystack, grain bin, or other combustible structure.
- Free from surrounding weeds and other combustible materials.
- Not located near open flames or in areas where smoking is allowed.

Other Types of ASTs

In general, any AST, other than a farm tank, must be designed in accordance with UL or equivalent standards and must be constructed of steel. Additional requirements depend on the classification of the tank (i.e., motor fuel dispensing, oil-burning equipment, etc.). NFPA requirements specify design and installation requirements for piping, dispensers, control valves, vents, fill ports, foundations, emergency shut-off devices, adjacency and minimum set-back distances, etc. Unique to motor fuel dispensing ASTs:

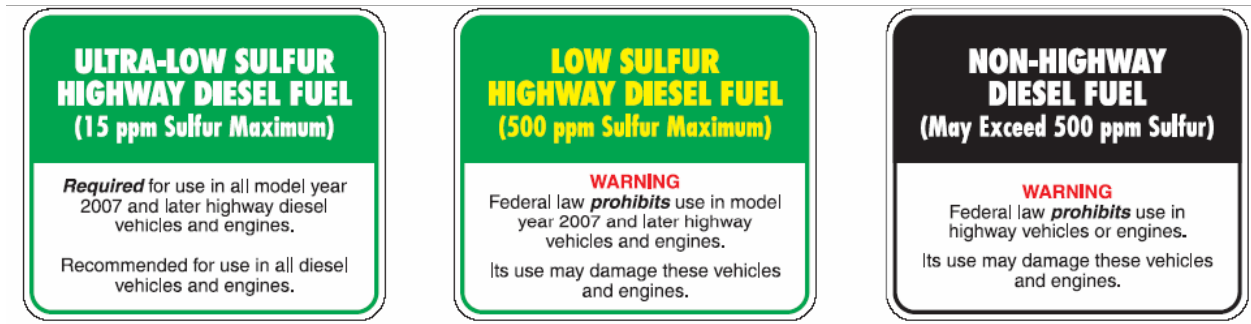
- ASTs must be enclosed by a chain link fence at least 6' in height with a secured gate, unless protected by perimeter fencing around the site.
- A telephone or other communication device must be readily available.

TANK LABELING REQUIREMENTS

Farm Tanks

All farm tanks must be labeled with the following:

- Flammable – Keep Fire and Flame Away.
- Keep 40 Feet From Buildings.
- Name of the Product (i.e., "Gasoline," "Used Oil," etc.).
- If the AST is greater than 550 gallons in size and contains diesel fuel, it must be labeled with an EPA diesel warning label that indicates the sulfur content of the fuel and use restrictions. Label selections are shown below:



Motor Fuel Dispensing

Motor fuel dispensing ASTs (or the area where the AST(s) is/are located) must be marked with the following:

- The NFPA diamond or warning words such as “flammable” or “combustible.”
- Name of the product contained within (i.e., “Gasoline,” “#2 Diesel”).

In addition to tank labeling, the following must be posted at the dispensers:

- Warning - It is unlawful and dangerous to dispense gasoline into unapproved containers. No smoking. Stop motor. No filling of portable containers in or on a motor vehicle. Place container on ground before filling.
- Operating instructions for the dispensers, if self-service.
- Emergency Instructions- In case of fire or spill: (1) Use emergency stop button. (2) Report accident by calling (specify local fire number) on the phone. Report location.
- If applicable, EPA diesel warning label that indicates the sulfur content of the fuel and use restrictions. See examples of the labels under the *Farm Tank* section above.

There may be fuel taxation labeling requirements as well. However, these considerations are beyond the scope of this SOP. Consult with UNL’s Department of Transportation Services for additional information.

Oil-Burning Equipment, Stationary Combustion Engine, and other ASTs

These types of ASTs must be marked with the following:

- The NFPA diamond or warning words such as “flammable” or “combustible.”
- Name of the product contained within (i.e., “Gasoline,” “#2 Diesel”).

SPILL CONTROL STRUCTURES

Requirements for spill control are a feature of both EPA and SFM regulations. However, there are some important differences.

- EPA’s SPCC regulations apply to all oil storage ASTs that are 55 gallons or greater in size; **and** which are located at a site that is subject to SPCC requirements because the aggregate quantity of oil stored exceeds the regulatory threshold. As previously stated, SPCC regulations apply to ASTs located on City and East Campuses.
- SFM spill control regulations apply to all ASTs, except farm tanks, regardless of the aggregate quantity of oil stored at the facility.

Hence, spill control is usually a required feature of an AST due to SPCC or NFPA regulations or both. For example, a farm tank located at a site that is subject to SPCC regulations will be subject to spill control requirements although not subject to NFPA spill control regulations. Other types of ASTs located at sites that are exempt from SPCC requirements are still subject to spill requirements per NFPA regulations. The SFM regulations are rather prescriptive in comparison to EPA's spill control regulations.

In general, satisfying the SFM's regulations for spill control will simultaneously satisfy EPA's physical structure requirements. NFPA regulations recognize the following three methods for providing spill control:

- Remote Impounding
- Impounding Around Tanks by Diking
- Secondary Containment Tanks

Use of double-walled or secondary containment tanks is conditioned on the following:

- The tank capacity does not exceed 12,000 gallons.
- Piping connections are made above the normal maximum liquid level.
- Means are provided to prevent releases of liquid from the tank by siphon flow.
- Means are provided for determining the level of liquid in the tanks which is accessible to the delivery operator.
- Means are provided to prevent overfilling by sounding an alarm when the liquid level in the tank reaches 90% of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95% of capacity.
- Spacing between adjacent tanks is not less than 3'.
- The tank is capable of resisting damage from impact of a motor vehicle or suitable collision barriers are installed.
- The interstitial space is also equipped with emergency vents.
- The integrity of the secondary containment tank is also established through tightness testing.

In addition to the physical containment requirements, if a site is regulated under SPCC there are additional spill control procedural and equipment requirements.

TANK INSPECTION AND TESTING REQUIREMENTS

Again, there is overlap and differences with respect to inspection and testing requirements based on applicability of NFPA and/or EPA. In general, NFPA requires:

- All ASTs be tested for tightness before being placed in service, and following relocation (if field constructed), structural damage, repair, and if suspected of leaking. The tightness testing done by the manufacturer of shop-fabricated ASTs is sufficient to satisfy the NFPA initial testing requirement. Tightness testing requirements also apply to the outer tank of double-walled, secondary containment tanks.
- Accurate daily inventory and reconciliation records for motor vehicle ASTs.
- Determination of the available capacity of any AST prior to off-loading fuel and physical attendance at all times during off-loading by the delivery personnel.

For those ASTs that are subject to SPCC requirements, the following testing and inspection requirements apply in addition to the NFPA requirements:

- Visual inspections of the AST, surrounding area, and spill kits are conducted by EHS on an annual basis. Operations personnel conduct visual integrity inspections of the AST on a monthly basis, and loading/unloading and visual inspections of rainwater discharge from secondary containment structures at each occurrence.
- API-certified inspectors conduct inspections (generally visual and quantitative or qualitative analysis) of large AST systems on a regular basis (at least every five years).

SPILLS, LEAKS, AND RELEASES

A release of petroleum from any source requires prompt action. The EHS SOP, ***Underground Storage Tanks – Release Reporting***, also applies to releases from ASTs. In addition, the UNL SPCC Manual provides guidance for responding to releases of petroleum and other oils from ASTs. Under UNL’s SPCC Plan, two scenarios are planned for oil spills. The first is for non-emergency spills (also referred to as “Incidental Oil Spills”) and the second is for “emergency oil spills.”

Incidental Oil Spill

An incidental spill is a manageable spill that poses no safety and health danger and is not likely to harm the environment. Incidental oil spill response procedures are as follows:

- Eliminate the source of the spill by up righting drums or other containers, closing valves, or other similar actions.
- Prevent the oil from spreading or entering drains by absorbing flowing oil or diking the area with sand bags, elastomer mats, or elastomer berms.
- Spread absorbent over the surface of the spill working from the perimeter of the spill to its center. Socks and pillows work best on pooled liquid while pads have an advantage on thin layers of oil. Oil Sorb® will work in either situation but can be more difficult to clean up.
- Call EHS at 2-4925 during normal business hours or by dialing the Campus Operator at “0” after hours if assistance in spill control and clean up is necessary.
- Contaminated absorbents of less than 5 gallons/30 pounds containing diesel fuel, motor oil, bunker oil and non-PCB containing transformer oil can be disposed as normal trash. Absorbents from all gasoline and PCB transformer oil spills and volumes of absorbents greater than 5 gallons/30 pounds must be sent to EHS for disposal. Containerize spill residues (i.e., contaminated socks, pads, Oil Sorb®, etc.) and affix a Hazardous Material Collection Tag (HMCT).

Emergency Oil Spill

The Incidental Oil Spill procedures must be modified for a spill that is an emergency. An emergency situation exists when:

- The quantity of spilled oil is 25 gallons or larger; or
- The spill has entered a sanitary or storm drain; or

- The spill has entered a ground or surface water; or
- The spill can not be contained or stopped or additional spill equipment is needed and is not immediately available.

In the case of an emergency spill, the person discovering it should perform the following once it has been determined that the situation is not life threatening:

- Take immediate action to stop the spill (i.e., shutting off valves, up righting containers, etc.).
- Take action to prevent the spill from entering sewers or streams and to minimize the area affected. Such actions might consist of absorbing flowing oil or diking the area with sand bags, elastomer mats, or elastomer berms, etc.
- Call EHS at 2-4925 during normal business hours or by dialing the Campus Operator at “0” after hours. Remain in the immediate vicinity until EHS personnel arrive on-site and relieve you from duty.

In the case of an emergency spill that poses a threat to human health or property, immediately call the Campus Operator at “0” or dial “911” to summon outside emergency responders. Take only those actions to stop or minimize the spill that do not pose a threat to human health and evacuate the area as necessary.

Reporting

EHS is responsible for reporting to local or state officials.

REMOVAL FROM SERVICE

If removing an AST from service, the SFM requires:

- Removal of product from the tank (to the extent feasible, and recognizing that some residues will likely remain in the tank). Product and residues are subject to disposal restrictions. Consult EHS for proper testing procedures and parameters.
- Rendering the tank’s atmosphere vapor-free.
- Protection of the tank from vandalism (generally meaning a fenced or secured area).

If selling the tank, notify potential buyers of the tank’s last contents. UNL Purchasing may also require that the listing specifically contain no warranty as to the tank’s fitness for service.

FLAMMABLE AND COMBUSTIBLE LIQUID CLASSIFICATIONS

Product	NFPA Flammable/Combustible Liquid Classification	Flash Point (FP)/Boiling Point (BP)
Antifreeze, brake fluid, lubricating oils, transmission fluid, grease, gear lube, etc.	Class IIIB	
#1 Diesel	Class II	FP = 100° F
#2 Diesel	Class II	FP = 125° F

#4 Diesel	Class II	FP = 130° F
Gasoline	Class I	FP = -40 to -50° F; BP = 100 to 400° F

Classification	Flash Point	Boiling Point
Class IIIB Combustible Liquid	> 200° F	
Class IIIA Combustible Liquid	140 to 200° F	
Class II Combustible Liquid	100 to 140° F	
Class IC Flammable Liquid	73 to 100° F	
Class IB Flammable Liquid	< 73° F	> 100° F
Class IA Flammable Liquid	< 73° F	< 100° F