
ABOVEGROUND PETROLEUM STORAGE TANKS

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., re-fueling of cars, pickups, tractors, 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 55 gallons in size and which are used to store petroleum products.

This SOP does not address other fuel regulations promulgated by other agencies (e.g., Department of Revenue - taxation and labeling regulations, etc.) or ASTs used to store hazardous substances.

REGULATORY AUTHORITIES

A summary of applicable United States Environmental Protection Agency (EPA), Nebraska State Fire Marshal (SFM), and Nebraska Department of Environment and Energy (NDEE) 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. As of the date of this SOP, SPCC regulations apply to ASTs located at City and East Campus Utility Plants, South Memorial Stadium, East Campus Tractor Test Laboratory, and certain sites at the ENREC.
- EPA also regulates certain aboveground and underground storage tanks under the Clean Air Act (CAA) (40 CFR Part 63 Subpart CCCCC). These regulations apply to Gasoline Dispensing Facilities (GDF). A Gasoline Dispensing Facility is defined as any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, non-road vehicle, or non-road engine, including a non-road vehicle or non-road engine used solely for competition; including, but not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.
- Nebraska Title 153 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 and 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 (now incorporated into NFPA 30A);

- NFPA 30, 2000 ed., Flammable and Combustible Liquid Code;
- NFPA 31, 2001 ed., Installation of Oil-Burning Equipment; and
- NFPA 37, 2002 ed., Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.
- NDEE 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*). NDEE 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

NDEE’s petroleum release regulations and EPA’s SPCC and CAA regulations do not distinguish between various types of ASTs. However, different Nebraska Title 153 and NFPA regulations apply to ASTs depending on use of the tank. In general terms (and in consideration of the various uses for petroleum ASTs at UNL), an AST is classified 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)

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, and; 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. These ASTs are subject to NFPA 395 (incorporated into newer versions of NFPA 30A).

Motor Fuel Dispensing

This classification encompasses UNL’s fleet fueling operations as well as tanks that are used for re-fueling of on- and off-road mobile engines (e.g., automobiles, tractors, ATVs, etc.). These ASTs are subject to NFPA 30A.

Pursuant to EPA Clean Air Act regulations, all motor vehicle Gasoline Dispensing Facilities must adhere to management practices that minimize vapor releases to the atmosphere.

Operators must be able to produce records of fuel received (or dispensed) to demonstrate average monthly throughput. These records must be available for the past 3 years. Average monthly fuel throughput is calculated as fuel received (or dispensed) during the past 365 days divided by 12. Required management practices prohibit handling of gasoline in a manner that may result in vapor releases to the atmosphere for extended periods of time; and include but are not limited to:

- Minimizing gasoline spills.
- Cleaning up spills as expeditiously as practicable.
- Covering all open gasoline containers and all gasoline storage tank fill-pipes with gasketed seals when not in use.

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. These ASTs are subject to NFPA 31.

Special EPA and NDEE 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. The designation of “oil-burning equipment” does not apply to internal combustion engines, oil lamps, or most portable devices.

Stationary Combustion Engine

This classification includes ASTs that are physically connected to combustion engines, such as irrigation pumps, grain dryers, emergency generators, etc. These ASTs are subject to NFPA 37. In addition, these engines are subject to certain CAA regulations. Consult EHS before purchasing, installing, rebuilding, or relocating any stationary internal combustion engine.

Other

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

TANK DESIGN/LOCATION REQUIREMENTS

Farm Tanks

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

- Tanks shall be of single-compartment design.
- Tanks shall be a minimum 12-gauge plate thickness.
- Each tank shall be provided with a fill opening that is equipped with a closure that is designed to be locked. The fill opening shall be separate from the vent opening.
- Each tank shall be provided with a free-opening vent that shall relieve either the vacuum or the pressure that might develop during normal operation or fire exposure.

The vent shall have the nominal pipe sizes: 1-1/2" for tanks up to 275 gallons; 2" for tanks of 275-660 gallons; 2-1/2" for tanks 661-900 gallons; 3" for tanks 901-1100 gallons)

- Vents shall be arranged to discharge so as to prevent localized overheating of, or direct flame impingement on, any part of the tank in the event that vapors from the vent are ignited.
- Tanks shall be located outside and at least 12 m (40 ft) from any important building. Tanks shall also be located so that any vehicle, equipment, or container that is filled directly from the tanks is at least 12 m (40 ft) from any important building.
- Tanks shall be permitted to have top openings only or shall be permitted to be elevated for gravity discharge.
- Each tank shall be provided with a listed emergency vent.
- Tanks that have top openings only shall be mounted and equipped as follows:
 - Stationary tanks shall be mounted on concrete, steel, or masonry supports at least 150 mm (6 in.) in height so as to protect the bottom of the tank from corrosion due to contact with the ground and to maintain the tank in a stable position.
 - Movable tanks shall be equipped with attached metal legs that rest on shoes or runners designed so that the tank is supported in a stable position and so that the tank and its supports can be moved as a single unit.
 - Tanks shall be equipped with a tightly and permanently attached approved pumping device having an approved hose and nozzle.
 - Each component of dispensing systems for Class I liquids shall be listed.
 - The dispenser nozzle and hose shall be designed so they can be padlocked to the hanger to prevent tampering.
 - The pump discharge shall be equipped with an effective anti-siphoning device, or the discharge hose shall be equipped with an approved self-closing nozzle.
 - Siphons or internal pressure discharge devices shall be prohibited.
- Tanks elevated for gravity discharge shall be mounted and equipped as follows:
 - Tanks shall be supported on masonry, concrete, or steel supports having adequate strength and designed to provide stability.
 - Discharge connections shall be made to the bottom or to the end of the tank.
 - The discharge connection shall be equipped with a valve that shall automatically close in the event of a fire by means of operation of an effective heat-actuated device. This valve shall be located adjacent to the tank shell. If this valve cannot be operated manually, an additional valve that can be manually operated shall be provided.
 - Each component of dispensing systems for Class I liquids shall be listed.
 - The nozzle shall be equipped so that it can be padlocked to its hanger to prevent tampering.
 - Hose used for dispensing Class II and III liquids shall be equipped with listed self-closing nozzles.
- Individual tanks shall not be interconnected or manifolded.
- Tanks shall be separated from each other by not less than 0.9 m (3 ft).
- The surrounding area shall be free from weeds and other combustible materials.
- Tanks shall not be 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 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.
- Submerged fill design, if throughput is 10,000 gallons/month or more (CAA requirement).

TANK INSTALLATION PERMITS

An Installation Permit must be obtained from UNL's Building Code Official 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 purchase or installation for review of other regulatory requirements (e.g., Clean Air Act requirements).

TANK LABELING REQUIREMENTS

Farm Tanks

All farm tanks must be labeled with the following:

- Flammable – Keep Fire and Flame Away.
- Name of the Product (i.e., "Gasoline," "Used Oil," etc.).

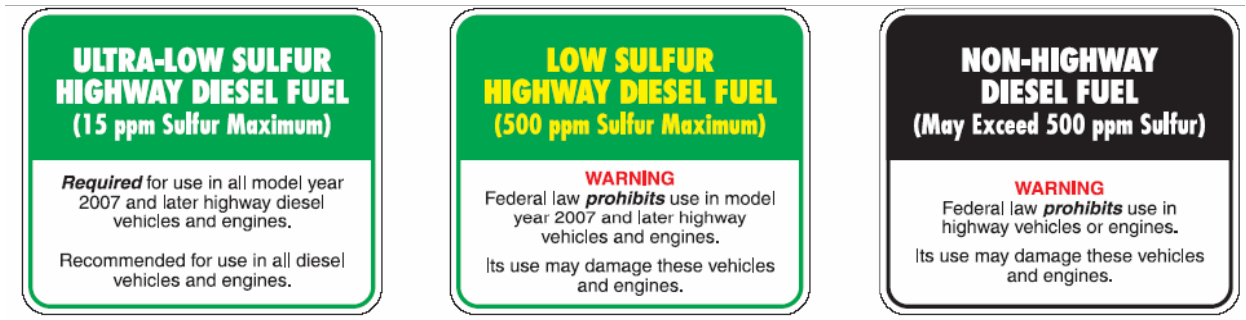
Motor Fuel Dispensing

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.



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 NFPA 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.
- NFPA 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 NFPA regulations are rather prescriptive in comparison to EPA’s spill control regulations.

In general, satisfying the NFPA 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. Refer to the site-specific SPCC plan.

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 regulations. 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 fueling ASTs are required under NFPA regulations; documentation of average monthly throughput is required under EPA CAA regulations.
- 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. This is also required under SPCC regulations

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 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 field constructed AST systems on a regular basis (at least every five years).

SPILLS, LEAKS, AND RELEASES

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; diking the area with sand bags, elastomer mats, or elastomer berms; or covering flush storm drain inlets with an elastomeric mat.
- 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 402-472-4925 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 spill has entered a sanitary or storm drain; or
- The spill has entered a ground or surface water; or
- The spill cannot 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 402-472-4925 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. Nebraska Title 126 requires reporting to NDEE of an oil release that:

- Is to the surface of the land in a quantity of 25 gallons or larger; or
- Is beneath the surface of the land in any quantity; or
- Impacts or threatens waters of the state or threatens public health or welfare.

All such releases must be immediately reported to EHS.

REMOVAL FROM SERVICE

If removing an AST from service, the following requirements must be met:

- 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 may also require that the listing specifically contain no warranty as to the tank's fitness for service. Selling and disposing should be in accordance with UNL asset management policies.