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FIRE MARSHAL'S OFFICE



300 W. Broad Street
Waynesboro, VA 22980

Storage Tank Closure and Removal Information

NOTE: This list is not all inclusive. All persons who make application for storage tank removal shall be familiar with and comply with the Virginia Statewide Fire Prevention Code (VSFPC), NFPA, Federal, State and Local laws ordinances, codes, standards and rules.

ALLOW 10 BUSINESS DAYS FOR PROCESSING. INSPECTIONS MUST BE SCHEDULED IN ADVANCE OF CLOSURE DATE.

Care is required not only in the handling and use of flammable or combustible liquids but also in the process of rendering temporarily out of service, closing, or removing tanks that have held flammable or combustible liquids. This is particularly true of underground service station tanks that are most frequently used for the storage of motor fuel and occasionally for the storage of other flammable or combustible liquids, such as crankcase drainings, which can contain some gasoline. Through carelessness, explosions have occurred because flammable or combustible liquid tanks have not been properly conditioned before being rendered temporarily out of service, closed, or removed.

In order to prevent accidents caused by improper conditioning, it is recommended that the procedures outlined here be followed when tanks are temporarily taken out of service, closed, or removed.

This application is to be used for the removal of Above (AST) and Below (UST) ground storage tanks used for storing flammable or combustible liquids. Multiple tanks in a common pit are covered under a single permit.

Abandonment and status of tanks.

Tanks taken out of service shall be removed in accordance with Section 5704.2.14 of the Virginia Statewide Fire Prevention Code (VSFPC), or safeguarded in accordance with VSFPC Sections 5704.2.13.1 through 5704.2.13.2.3 and API (American Petroleum Institute) 1604.

Underground tanks.

Underground tanks taken out of service can be safeguarded or disposed of by any one of the following three means:

1. Placement in a temporarily out-of-service condition. Tanks should be rendered temporarily out of service only when it is planned that they will be returned to active service within a reasonable period or pending closure in place or closure by removal.
2. Permanent closure in place, with proper safeguarding.
3. Permanent closure by removal.

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Underground tanks taken out of service shall comply with Sections 5704.2.13.1.1 through 5704.2.13.1.5 of the VSFPC.

Temporarily out of service.

When the underground storage tank system (UST) is temporarily out of service for less than 3 months, the owners and operators should comply with the following:

1. Continue operation and maintenance of corrosion protection. Requirements can be found in U.S. Environmental Protection Agency (EPA), 40 CFR 280.31, "Technical Standards and Requirements for Owners and Operators of Underground Storage Tanks."
2. Continue operation and maintenance of any release detection in accordance with U.S. EPA, 40 CFR 280, Subpart D, or empty the UST system by removing all materials so that no more than 1 in. (25 mm) of residue, or 0.3 percent by weight of the total capacity of the UST system, remains in the system.

Underground tanks temporarily out of service shall have the fill line, gauge opening, vapor return and pump connection secure against tampering. Vent lines shall remain open and be maintained in accordance with VSFPC Sections 5704.2.7.3 and 5704.2.7.4.

Out of service for 90 days.

When a UST system is temporarily out of service for 3 months or more, owners and operators should also comply with the following requirements:

1. Leave vent lines open and functioning
2. Cap or plug all other lines such as fill line, gauge opening, pump suction, and ancillary equipment and secure against tampering

Underground tanks not used for a period of 90 days shall be safeguarded in accordance with all the following or be removed in accordance with VSFPC Section 5704.2.14:

1. Flammable or *combustible liquids* shall be removed from the tank.
2. All piping, including fill line, gauge opening, vapor return and pump connection, shall be capped or plugged and secured from tampering.
3. Vent lines shall remain open and be maintained in accordance with VSFPC Sections 5704.2.7.3 and 5704.2.7.4.

Out of service for one year.

When a UST system is temporarily closed for more than 12 months, owners and operators should permanently close the UST system in accordance with U.S. EPA, 40 CFR 280.71–280.74. An extension of this 12-month period can be granted by the implementing agency. However, before such an extension can be applied for, a site assessment should be completed in accordance with U.S. EPA, 40 CFR 280.72.

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Underground tanks that have been out of service for a period of one year shall be removed from the ground in accordance with Section 5704.2.14 or abandoned in place in accordance with VSFPC Section 5704.2.13.1.4.

Exception: Underground storage tanks subject to the Virginia State Water Control Board regulation 9VAC25-580.

Tanks abandoned in place.

At least 30 days before beginning closure procedures, owners and operators should notify the implementing agency of their intent to close unless such action is in response to corrective action proceedings.

Closure of tanks either in place or by removal requires the owners and operators to measure for the presence of a release where contamination is most likely to be present at the UST site. This requirement can be satisfied if one of the external release detection methods allowed in 40 CFR 280.43(e) and (f) is operating in accordance with the requirements in Part 280.43 at the time of closure and indicates no release has occurred.

Prepare a safe workplace by following the special safety precautions and cleaning and closure procedures in either of the following documents:

1. API 1604, *Closure of Underground Petroleum Storage Tanks*
2. NEIWPC, *Tank Closure Without Tears: An Inspector's Safety Guide*

Safe work preparation should include the following:

1. No smoking in the area.
2. Shutting down all open flame and spark-producing equipment not necessary for the removal of the underground tank.
3. Using only hand tools to expose tank fittings and preparing for the vapor-freeing procedures.
4. Controlling static electricity or providing a conductive path to discharge static electricity by bonding and grounding equipment and vehicles.
5. Roping off tank area from pedestrian and vehicular traffic.
6. Locating and marking all utility lines on site.

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7. Determining meteorological conditions. Vapor accumulation can occur on still and high-humidity days. Under these conditions, test the area for vapor accumulation, and if present, either provide additional forced ventilation or delay the job until there is a breeze and it is less humid. Excavated soil should be tested for vapor release. Artificial ventilation or repeated turning of excavated soil might be necessary to avoid ignitable concentration of vapors.
8. Ensuring that personnel are wearing hard hats, safety shoes, and safety glasses and that a combustible gas indicator is available. Providing any other safety measures or methods that might be required to meet local requirements.

Remove all flammable or combustible liquid and residue from the tank and from all connecting lines. Residual product and solids should be disposed of properly. Excavate to the top of the tank. Disconnect the suction, inlet, gauge, and all other tank fixtures. The vent line should remain connected until the tank is purged. Either purge the tank of flammable vapors or inert the potentially explosive atmosphere in the tank.

Purging or ventilating the tank replaces the flammable vapors in the tank with air, reducing the flammable mixture of fuel and oxygen below the lower explosive limit or lower flammable limit (LFL). Two methods can be used to introduce air into the tank. One is the use of a "diffused-air blower" to pump air into the bottom of the tank through the fill pipe or a properly bonded air-diffusing pipe. The second method is the use of an "eductor-type air mover," typically driven by compressed air. It draws vapors out of the tank and brings fresh air into the tank. The vent pipe can be used to exhaust vapors 12 ft (3.7 m) above grade and 3 ft (0.9 m) from any roof lines.

Inerting the tank does not replace the flammable vapors but instead reduces the concentration of oxygen to a level insufficient to support combustion. Two inert gases can be used. Carbon dioxide gas can be generated by crushing and distributing dry ice evenly over the bottom of the tank. The dry ice will release carbon dioxide as it warms. Nitrogen gas can be pumped into the tank from a hose through the fill hole to the bottom of the tank. Oxygen will be reintroduced into the tank unless all holes are effectively plugged except for the vent line.

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The tank should be tested to determine if it is safe by one of the following procedures:

1. When purging, a combustible gas indicator is used to measure the reduction in the concentration of flammable vapors. The meter reads from 0 to 100 percent of the LFL. The goal is to achieve a reading of 10 to 20 percent LFL for petroleum tanks.
2. When inerting, an oxygen meter is used to determine when a tank has been successfully inerted. The meter reads from 0 to 100 percent oxygen content. The goal is to achieve a reading of 1 to 10 percent, which is safe for most petroleum products.

Fill the tank completely with an inert solid material. One or more holes can be cut in the tank top if existing tank openings are not adequate for the introduction of the inert material. Cap or remove remaining underground piping. The tank can now be backfilled.

To summarize, tanks abandoned in place shall be as follows:

1. Flammable and *combustible liquids* shall be removed from the tank and connected piping.
2. The suction, inlet, gauge, vapor return and vapor lines shall be disconnected.
3. The tank shall be filled completely with an *approved* inert solid material.
4. Remaining underground piping shall be capped or plugged.
5. A record of tank size, location and date of abandonment shall be retained.
6. All exterior above-grade fill piping shall be permanently removed when tanks are abandoned or removed.

Reinstallation of underground tanks.

Tanks which are to be reinstalled for flammable or *combustible liquid* service shall be in accordance with VSFPC Chapter 57, ASME *Boiler and Pressure Vessel Code* (Section VIII), American Petroleum Institute (API) 12-P, API 1615, UL 58 and Underwriters Laboratories (UL) 1316.

Above-ground tanks.

Above-ground tanks taken out of service shall comply with VSFPC Sections 5704.2.13.2.1 through 5704.2.13.2.3.

Temporarily out of service.

Above-ground tanks temporarily out of service shall have all connecting lines isolated from the tank and be secured against tampering.

Exception: In-place fire protection (foam) system lines.

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Out of service for 90 days.

Above-ground tanks not used for a period of 90 days shall be safeguarded in accordance with VSFPC Section 5704.2.13.1.2 or removed in accordance with VSFPC Section 5704.2.14.

Exceptions:

1. Tanks and containers connected to oil burners that are not in use during the warm season of the year or are used as a backup heating system to gas.
2. In-place, active fire protection (foam) system lines.

Out of service for one year.

Above-ground tanks that have been out of service for a period of one year shall be removed in accordance with VSFPC Section 5704.2.14.

Exception: Tanks within operating facilities.

Removal and disposal of tanks.

Removal and disposal of tanks shall comply with VSFPC Sections 5704.2.14.1 and 5704.2.14.2. Observe all procedures filling the tank with an inert solid material and backfilling the excavation.

After the tank has been made safe by following purging or inerting procedures and before it is removed from the excavation, plug or cap all accessible holes. One plug should have a $\frac{1}{8}$ in. (3 mm) vent hole to prevent the tank from being subjected to excessive differential pressure caused by temperature changes. This vent should be positioned on top of the tank during subsequent transportation or storage.

Excavate around the tank to uncover it for removal. Remove the tank from the excavation and check for corrosion holes in the tank shell. Use screwed boiler plugs to plug any corrosion holes.

Tanks should be labeled with information about the former contents, present vapor state, vapor-freeing treatment method, and a warning against reuse.

Tanks should be removed from the site promptly and preferably the same day as taken from the ground because additional vapor can be released from liquid absorbed in tank wall corrosion or residues.

However, before removal, the tank atmosphere must be checked to ensure the flammable vapor concentration does not exceed safe levels.

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Removal.

Removal of above-ground and underground tanks shall be in accordance with all of the following:

1. Flammable and *combustible liquids* shall be removed from the tank and connected piping.
2. Piping at tank openings that is not to be used further shall be disconnected.
3. Piping shall be removed from the ground.

Exception: Piping is allowed to be abandoned in place where the *fire code official* determines that removal is not practical. Abandoned piping shall be capped and safeguarded as required by the *fire code official*.

4. Tank openings shall be capped or plugged, leaving a 1/8-inch to 1/4-inch-diameter (3.2 mm to 6.4 mm) opening for pressure equalization.
5. Tanks shall be purged of vapor and inerted prior to removal.
6. All exterior above-grade fill and vent piping shall be permanently removed.

Exception: Piping associated with bulk plants, terminal facilities and refineries.

Disposal.

Tanks shall be disposed of in accordance with federal, state and local regulations.

Disposal of Underground Storage Tanks.

If the reuse of a tank is permitted by the controlling jurisdiction, the tank should be certified that it is tight, structurally sound, and will meet all requirements of a new installation. The storage of used tanks should be in secure areas where the public will not have access. Tanks should be rendered safe and vented.

If a steel tank is to be disposed of, it should be retested for flammable vapors and, if necessary, again rendered gas free. Tanks that have been lined internally or coated externally with fiberglass, epoxy-based, or similar materials might not be accepted by scrap processors. Before releasing to a scrap metal dealer, a sufficient number of holes or openings should be made in the tank to render it unfit for further use. NFPA 326 provides information on safe procedures for such operations.

If the tank to be disposed of is nonmetallic or is a steel tank lined internally or coated externally with fiberglass, epoxy-based, or similar materials, it might not be accepted by scrap metal dealers. An alternative disposal method would be to cut up the tank in sections suitable for disposal in a sanitary landfill.

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It is important that you provide the proposed removal date. Once the permit is processed, an inspection will be scheduled for the site. The following is a list of the required site inspections that must occur at specific intervals during the closure process to maintain compliance (type of inspection may vary based on the type of closure):

1. Initial site inspection to issue the permit.
 - General site assessment.
 - Check for site security.
 - Ensure utilities are located and marked in the area.
 - Fire extinguishers are present.
 - No Smoking signs posted.
 - Confirm size, type, and number of tanks.
 - Check for any obvious signs of leaks.
 - Photograph site prior to closure procedures.
2. Second site inspection upon unearthing the tank (UST Only)
 - Inspect for obvious signs of leakage.
 - Spoil piles are on plastic and protected to prevent runoff.
 - Soil samples are collected from spoil pile and from under each tank. Multiple samples may be required based on size of tank(s).
 - Inspect that the tank(s) have been purged of any flammable/combustible vapors and cleaned of any remaining product and sludge.
 - **Note:** No cutting torch or other flame- or spark-producing equipment should be used until the tank has been completely purged or otherwise rendered safe. In each case, the steps given should be carried out successively.
 - Photograph site to include tanks.
3. Third site inspection
 - Ensure that the tank(s) have been removed or properly filled with an approved inert solid material if being abandoned in place.
 - Ensure all vent lines have been removed or properly capped and terminated.
 - Photograph site.
4. Final site inspection
 - Check for proper backfill where necessary
 - **Note:** Excavations may be backfilled with the express understanding that they may have to be re-opened at the owner's expense for remediation based on the laboratory report.
 - Photograph site.

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Record Keeping.

Record keeping is required to demonstrate compliance with closure requirements. The results of the excavation zone assessment required should be maintained for at least 3 years after completion of permanent closure.

In cases where tanks are either rendered temporarily out of service or permanently closed, records should be kept of tank size, location, date of closure, and method used for placing the closed tank in a safe condition.

Maintenance.

Above-ground tanks, connected piping and ancillary equipment shall be maintained in a safe operating condition. Tanks shall be maintained in accordance with their listings. Damage to above-ground tanks, connected piping or ancillary equipment shall be repaired using materials having equal or greater strength and *fire resistance* or the equipment shall be replaced or taken out of service.

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