



# Secondary Containment for Aboveground Storage Tanks

**S**econdary containment helps prevent serious environmental problems from occurring because of tank releases. While the tank itself is vital to minimize the potential for leaks, secondary containment is another important safeguard from potential releases. This fact sheet outlines the requirements and choices available for secondary containment for aboveground storage tanks (ASTs) according to Minn. R. ch. 7151.

## Compatibility

If more than one type of substance is stored within a single containment area, the substances must be compatible with each other and the containment material.

## Volume

For containment areas which are exposed to precipitation, the containment area capacity (available space) must be at least 110 percent of the size of the largest tank in the containment area.

For containment areas which are not exposed to precipitation, the containment area capacity must be at least 100 percent of the size of the largest tank in the containment area.

A separate containment area is not required for double-walled tanks.

## Materials

The acceptable impermeable materials that must be used for construction of the containment area for ASTs installed on November 2, 1998, or later include:

- compacted clay (if clay is used, it must have a minimum of 12 inches compacted clay, be protected with cover material to prevent drying and erosion, be designed, inspected, and certified by a registered professional engineer, and be tested after installation to meet a permeability rate to water equal to or less than  $1 \times 10^{-7}$  cm/sec)
- a geosynthetic clay liner
- concrete
- a synthetic membrane
- the outer layer of a double-walled tank
- fabricated steel
- fiberglass

Containment areas with tanks that were installed before November 2, 1998, may be constructed using any of the impermeable materials listed above, or may be constructed of native or amended soils that have been tested to meet the following minimum permeability rates for the applicable substance type and hydrology.

Soil testing requirements are explained in the fact sheet "Permeability Testing for Secondary Containment Areas."

**Permeability rates to water for secondary containment areas made of native or amended soils (pre-November 2, 2008, tanks only)**

Substance Classification	If ground water or bedrock is < 10 feet from grade or AST is within 100 feet of Class 2 water	If ground water or bedrock is ≥ 10 feet from grade or AST is within 100 feet of Class 2 water
Type A	Minimum of three feet of soil at $1 \times 10^{-5}$ cm/sec	Minimum of three feet of soil at $1 \times 10^{-4}$ cm/sec
Type B	Minimum of three feet of soil at $1 \times 10^{-4}$ cm/sec	Minimum of three feet of soil at $1 \times 10^{-3}$ cm/sec
Type C	Minimum of three feet of soil at $1 \times 10^{-3}$ cm/sec	No minimum permeability standard

Type A substances include gasoline, aviation gas, naphtha, denatured ethanol, hazardous materials, and mixtures or blends of these with Types B and C substances. (Antifreeze is considered a Type A substance.)

Type B substances include crude oil, diesel, kerosene, jet fuel, fuel oil types one through four, waste oils, and mixtures or blends of these with Type C substances. (Virgin lube oil is considered a Type B substance.)

Type C substances include asphalt cement, roofing flux, fuel oil types 5 and 6, and other regulated substances which are not petroleum-based and not hazardous materials.

**Release detection design**

For ASTs installed on November 2, 1998, or later, and for ASTs installed before that date which are lifted or moved after that date, the area of secondary containment which is directly under the tank must be designed to allow for visual detection of a release of a substance through the tank floor.

Release detection designs that can be used include:

- tank is elevated
- continuous concrete slab under the tank ( in the case of a Type A substance, slab must be treated with material that is impermeable to the substance)
- fiberglass or steel pad under the tank
- synthetic membrane under the tank
- double-walled tank (shop fabricated)
- double bottom tank (field erected)

**Temporary tanks**

Temporary tanks are ASTs located at a facility for more than 30 days, but less than one year. Secondary containment areas for temporary tanks must meet the volume requirements described above, and be constructed either of the impermeable materials listed above or meet the applicable permeability rate from the table above.

**Drainage**

Precipitation that collects within the secondary containment area must be discharged in compliance with all state and federal regulations

**Containment evaluation**

Owners and operators of tanks must retain, for the life of the tank system, the following written records of sampling and testing used to evaluate permeability of soil containment areas:

- classification of soils used in containment area construction
- soil descriptions and logs of each sample location
- a table of individual permeability tests
- permeability of the soil expressed as cm/sec for each sample location and for each containment area

**Need more information?**

Visit the AST Program at [www.pca.state.mn.us/cleanup/ast.html](http://www.pca.state.mn.us/cleanup/ast.html). The site has forms, fact sheets, and other information about ASTs and AST requirements.

You can also call the MPCA at 651-296-6300 or 1-800-657-3864.