

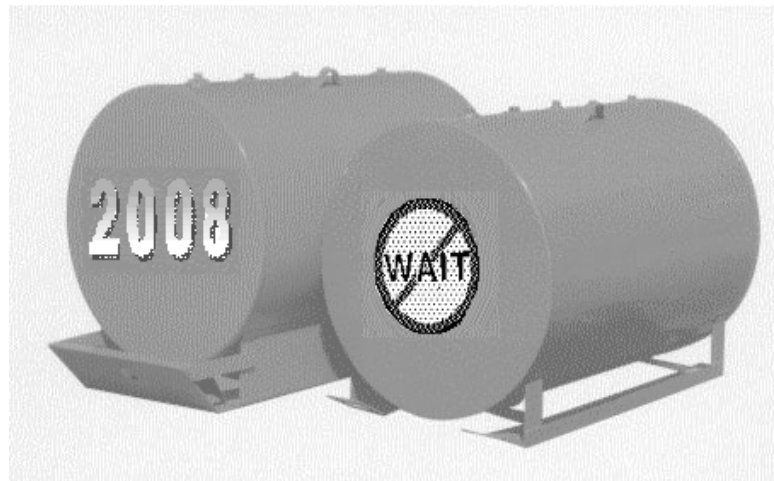
DON'T WAIT UNTIL 2008

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Spill, Overfill, and Corrosion Protection for Aboveground Storage Tanks in Michigan



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Don't Wait Until 2008

Spill, Overfill, and Corrosion Protection for Aboveground Storage Tanks in Michigan

Why You Should Read This Document

This document contains information to help you meet requirements for aboveground storage tank systems (ASTs). These requirements apply to storage tanks installed after August 13, 2003, referred to as "new" and storage tanks installed before August 13, 2003, referred to as "existing."

State rules require you to make sure your existing ASTs have ALL of the following by August 13, 2008:

- Spill protection
- Overfill protection
- Corrosion protection

You must choose ONE of the following actions for an existing AST:

- Add spill and overfill protection and corrosion protection
- Replace existing AST with a new AST, which conforms to all requirements of the rules
- Close the existing AST by August 12, 2008

You should act as soon as possible. Without the protection provided by upgrading or replacing, your AST is more likely to leak, damage the environment, and leave you with costly cleanups. The following text lists several advantages of acting early.

This document focuses on how you can meet upgrade requirements. You can find more information on the requirements for new AST systems in the Michigan Flammable/Combustible Liquids (FL/CL) Rules. Except where otherwise directed, questions concerning this document should be directed to the Michigan Department of Environmental Quality (MDEQ), Waste and Hazardous Materials Division, Storage Tank and Solid Waste Section, Storage Tank Unit at (517) 335-7211.

Why Should You Upgrade or Replace Early?

- Early upgrading or replacing prevents leaks that would otherwise occur between now and August 2008. Avoiding leaks benefits the environment and your business. If your AST does not leak, you will not face costly mandatory cleanups, potential criminal suits, or civil suits for damage claims.
- As August 2008 nears, increased customer demand to upgrade, close, or replace ASTs may result in higher charges for these services. Also, you may have trouble finding available contractors and supplies needed to meet the deadline.
- It can take several months to upgrade, close, or replace your system. Bad weather or contractor delays are not unusual. Before work can start, local construction and regulatory permits may be necessary. The sooner you get started, the better the chance you will meet or beat the 2008 deadline.

- If you miss the 2008 deadline for any of the reasons noted above, you can be cited for violations, fined, and/or subject to red-tagging.

What Are The Basic Upgrade Requirements For Existing ASTs?

Spill Protection

- Prevent release of liquid into the environment when the transfer hose is detached from the fill pipe or the transfer connection for the storage tank.

Overfill Protection

- Tanks filled by pipeline or marine vessels:
 - Must meet the requirements of section 5j to 5o of 1941 PA 207, MCL 29.5j to MCL 29.5o and follow formal written procedures to prevent overfilling of tanks.
- Double wall tanks:
 - Both an alarm at 90% capacity and an automatic stop at 95% capacity.
 - Means accessible to delivery operator, to determine level of liquid in tank.
- Single wall tanks:
 - Either automatic stop at 95% or an audible alarm at 90% of the capacity of tank.
 - Means accessible to delivery operator, to determine level of liquid in tank.
- *Exception tanks:*
 - *3,000 gallons or less with spill protection, level gauge, and located a minimum of 10 feet from a building, can have an audible alarm at 90% only.*

Corrosion Protection

The exterior of the tank bottom, for either single or double-bottom tanks that are installed on grade, at the same elevation as the bottom of the diked area, shall be protected against corrosion by ONE of the following:

- A properly engineered, installed, and maintained cathodic protection system;
- A new bottom shall be provided with cathodic protection, and interstitial monitoring;
- Determine corrosion rate, giving life expectancy for tank;
- A shop-applied external mastic-coated bottom; or
- The tank must be raised to allow visual inspection of underside of tank.

How Can You Protect Against Spills?

When a tank is filled, liquid can be released at the fill pipe. Protecting the area that surrounds the fill pipe or the liquid transfer connection with spill containment will prevent a release of liquid into the environment when the transfer hose is detached from the fill pipe or the transfer connection.

How Can You Protect Against Overfills?

When a tank is overfilled, large volumes can be released at the fill pipe and through loose fittings on the top of the tank. The tightness of these fittings normally would not be a problem if the tank were not filled beyond its capacity.

You can solve overfill problems by:

- Making sure there is enough room in the tank for the delivery BEFORE the delivery is made;
- Watching the entire delivery to prevent overfilling or spilling; and
- Using equipment that protects against overfills.

Double wall tanks are required to have both an alarm at 90% capacity and an automatic stop at 95% capacity. In no case shall these provisions restrict or interfere with the proper functioning of the normal vent or the emergency vent.

Tanks at terminals that receive and transfer Class I liquids from mainline pipelines or marine vessels shall follow formal written procedures to prevent overfilling.

All other single wall ASTs shall be equipped with means that are accessible to the delivery operator for determining the liquid level in the tank. Provisions shall be made to either automatically stop the delivery of the liquid to the tank when the liquid level in the tank reaches 95% of the capacity of the tank or sound an audible alarm when the tank reaches 90% of the capacity of the tank.

The types of overfill protection devices (automatic shutoff devices and overfill alarms) are described below.

1. What are Automatic Shutoff Devices?

An automatic shutoff device installed in an AST's fill pipe can slow down and then stop the delivery when the product has reached a certain level in the tank. This device – sometimes simply called a “fill pipe device” – has 1 or 2 valves that are operated by a float mechanism.

Some automatic shutoff devices work in 2 stages. The first stage drastically reduces the flow of product to alert the driver that the tank is nearly full. The driver can then close the delivery valve and still have room in the tank for the product left in the delivery hose.

If the driver does not pay attention and the liquid level rises higher, the valve closes completely and no more liquid can be delivered into the tank, leaving the driver with a delivery hose full of product.

2. What Are Overfill Alarms?

Overfill alarms use probes installed in the tank to activate an alarm when the tank is 90% full. The alarm should provide enough time for the driver to close the truck's shutoff valve before tank overfill happens. Alarms must be located where the driver can see or hear them easily.

What Is Corrosion Protection?

Corrosion protection is a means of protecting a tank system to prevent the degradation of the metal through oxidation or reactivity with its environment.

State rules require corrosion protection for ASTs because unprotected steel ASTs corrode and release product through corrosion holes.

How Can You Protect Against Corrosion?

You already meet the requirements for corrosion protection if your AST matches one of the following:

Field erected tanks [greater than 50,000 gallons]

- A cathodic protection system is installed and maintained;
- You have established a corrosion rate through internal inspections; or
- You have installed a second bottom with interstitial monitoring and cathodic protection.

Shop fabricated tanks [50,000 gallons or less]

- You have established a corrosion rate through internal inspections;
- You have installed a second bottom with interstitial monitoring and cathodic protection;
- It is a secondarily contained tank with leak detection in interstice and cathodic protection;
- The bottom of the tank is raised to allow visual inspection for leaks from the underside of the storage tank;
- A corrosion-resistant coating is applied to isolate the bottom of the tank from the surrounding environment;
- Cathodic protection system is installed and maintained; or
- It is a UL-2085 tank with interstitial monitoring.

What is Cathodic Protection?

Cathodic protection, by use of an impressed current system, is defined as:

An impressed current system uses a rectifier to convert alternating current to direct current. This current is sent through an insulated wire to the “anodes,” which are special metal bars buried in the soil near the AST. The current then flows through the soil to the AST system, and returns to the rectifier through an insulated wire attached to the AST. The AST system is protected because the current going to the AST system overcomes the corrosion-causing current normally flowing away from it.

What About Piping?

Existing steel piping must have cathodic protection when in contact with soil. Note that cathodic protection needs to be tested and inspected periodically and records kept as described below.

Piping entirely above ground must be suitably protected from corrosion, such as painted.

Adding Cathodic Protection to a Tank System Requires the Following:

First, establish tank tightness:

- If the tank is less than 10 years old, you can use results from 2 tank tightness tests to show the AST is not leaking. The first test takes place before you install cathodic protection, and the second test takes place between 3 and 6 months after installation of the cathodic protection.
- If the tank is 10 years old or more, it must be internally inspected, tested, and assessed to make sure that the tank is structurally sound and free of corrosion holes.

Second, install cathodic protection.

Regulations require a qualified Cathodic Protection Expert to design, supervise install, and inspect cathodic protection systems installed at the AST site. The system must be tested by a Qualified Cathodic Protection Tester within 6 months of installation and at least every 3 years thereafter. You will need to keep the results of the last 2 tests to prove that the cathodic protection is working.

In addition, you must inspect an impressed current system every 60 days to verify that the system is operating. Keep results of your last 3 inspections to prove that the impressed current system is operating properly.

How Do You Establish A Corrosion Rate?

A corrosion rate for an AST is established from an internal inspection of the AST, comparing current metal thickness to original thickness. A corrosion rate is the determined life expectancy, without leaking, of the storage tank in its current environment/location.

There are 2 methods of approved internal inspection, API standard 653 and STI SP001-00. An internal inspection must be performed by a certified inspector. Upon completion of the inspection, the certified inspector will establish a calculated corrosion rate. The corrosion rate is based on original construction thickness data or deterministic methods in accordance with API 653 or STI SP001-00 at the time of inspection.

What if Original "Built To" Data is not Known?

If the original construction thickness data is not available, an internal inspection must be performed to establish a baseline for the development of a corrosion rate. A subsequent internal inspection, within 5 years, is then performed to establish a calculated corrosion rate.

How Do You Protect the Bottom of an AST From Corrosion?

One method of protecting the bottom of an AST is the application of a corrosion-resistant coating applied during manufacture to isolate the metal from the surrounding environment to help protect against corrosion.

Another method, for existing tanks, is to install a second bottom with corrosion protection, following an internal inspection to verify the integrity of the tank. The second bottom may be integral or an external impermeable liner. Either method of installing a second bottom, integral or external, requires monitoring of the interstitial space for the presence of water or product.

What If You Close Or Replace The AST?

If you do not upgrade your existing AST by August 13, 2008, then you must properly close it. After closing the AST, you may replace it by installing a new AST. Basically, state rules require ALL the following when closing or replacing an AST:

- Notify MDEQ at least 30 days before you take an AST out of service for closure or replacement.
- Determine if releases from your AST have contaminated the surrounding environment. If you find contamination, you will have to take corrective action. Visible, olfactory, or analytical evidence of a flammable or combustible liquid beneath or surrounding the tank system constitutes a release and is subject to the provision in Section 2.3.2.3 of the Michigan FL/CL Rules.
- Have the tank emptied of liquids, dangerous vapor levels, and accumulated sludge. These potentially very hazardous actions need to be carried out by trained personnel who carefully follow standard safety practices. After the tank has been properly emptied, you must safeguard it against trespassing or have it removed. Piping that is permanently removed from service must be emptied of all liquid and sludge, be purged and capped, or removed.

Organizations to Contact for Tank Information:

API (American Petroleum Institute), 1220 L Street, N.W., Washington, DC 20005, (202) 682-8000

NACE International (formerly the National Association of Corrosion Engineers), Box 218340, Houston, TX 77218-8340, (713) 492-0535

STI (Steel Tank Institute), 570 Oakwood Road, Lake Zurich, IL 60047, (847) 438-8265

Quick Compliance Checklist

You should be in compliance with the “upgrade” requirements if you can check off the major items below for each of your AST systems by August, 2008:

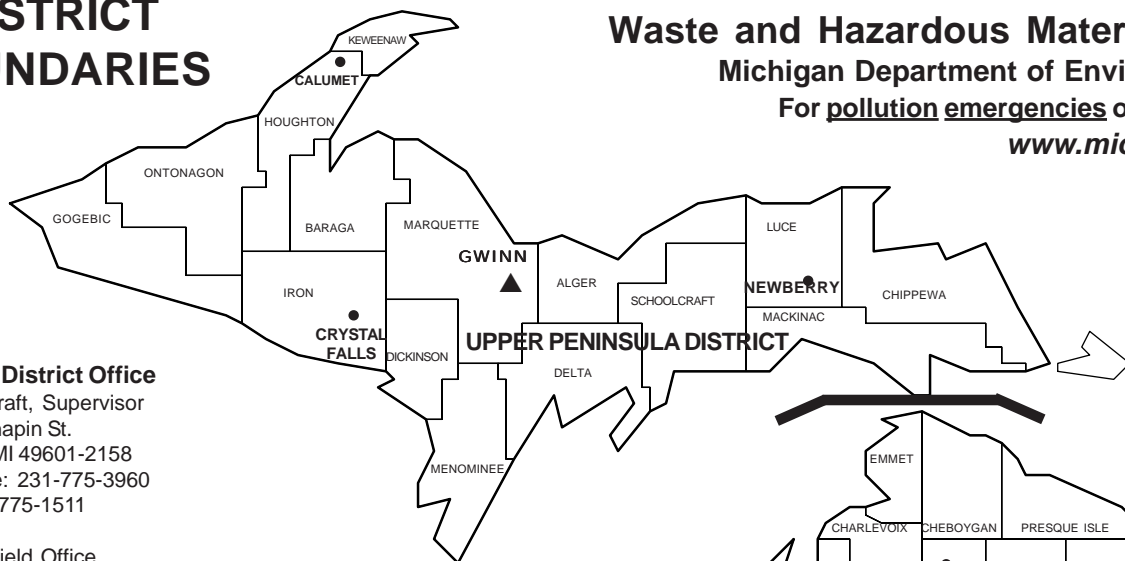
- Spill protection** provides containment at transfer connection
- Overfill protection** provided by an alarm at 90% and/or automatic shutoff at 95% tank capacity. Tanks filled by pipeline will follow requirements of Act 207.
- Corrosion protection for the tank** shall be provided by one of the following:
 - Mastic coating on bottom tank
 - Raised to allow visual inspection of tank bottom
 - Second bottom with interstitial monitoring and corrosion protection
 - Internal inspection with determined corrosion rate
 - Properly engineered, installed, and maintained cathodic protection system
 - Double walled tank with interstitial monitoring and corrosion protection

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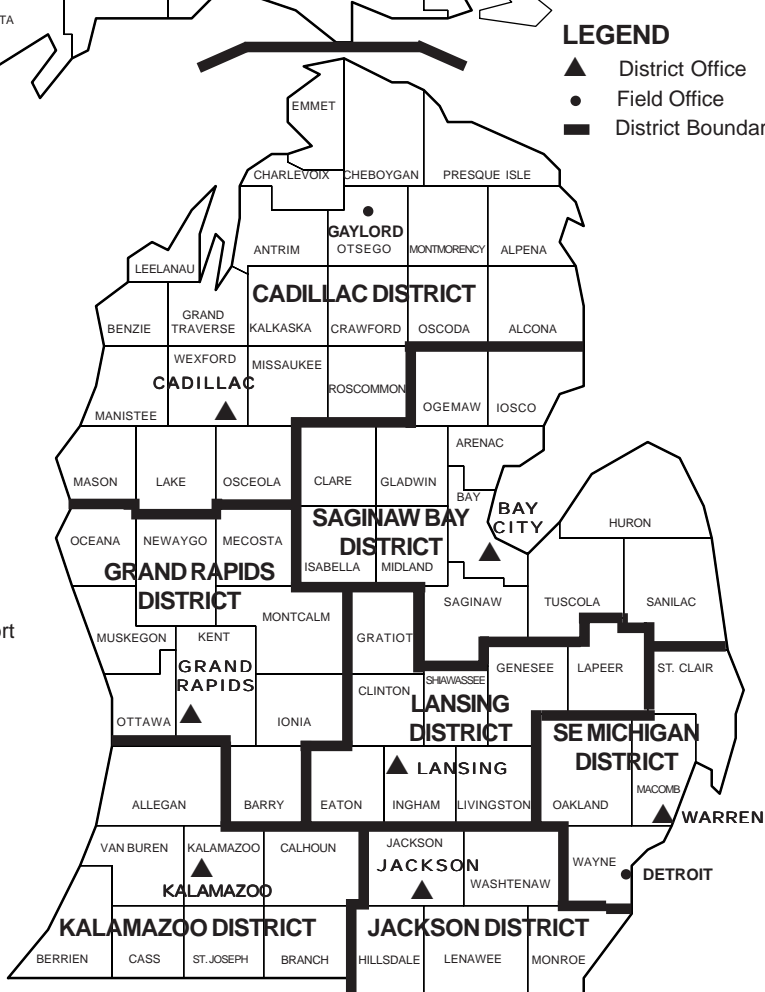
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LEGEND

- ▲ District Office
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