

## In Praise of Double-Wall Tanks

By Ted Unkles, Coordinator, Underground Storage Tank Program

In 1987, Vermont's first set of Underground Storage Tank Rules required that any regulated underground tank installed after September 1 of that year, must be a double-wall tank. Because so many tanks have been replaced since 1987, approximately three-quarters of the tanks at gas stations and mini-marts in Vermont are now double-wall tanks.

When the double-wall requirement went into effect more than 20 years ago, both the petroleum industry and the environmental regulators thought that leaking tanks would no longer be a problem. We were wrong, but the good news is that today there are very few leaks that result in a release of petroleum product to the environment. Double-wall tanks have a built-in warning system that, if someone is paying attention, usually alert people to a problem before anything leaks out into the environment.

Vermont requires owners and operators of regulated underground tanks to check once each week to be sure the tank is not leaking. Single-wall tanks are difficult to monitor, and if a single-wall tank does have a problem it's likely that some petroleum product has already escaped to the environment. With a double-wall tank, the space between the two walls (known as the interstitial space) can be checked, and if a problem is found, it almost never results in a release to the environment.

How do double-wall tanks fail? Tanks can corrode from both the inside and the outside. The tanks are designed with features to prevent corrosion, but as with all technology, nothing is perfect. Water can get inside the tank, and cause corrosion of the inner wall. If a tank's cathodic protection system does not function correctly, acid soils can cause the outer wall to corrode. This problem can be exacerbated if the tank contains a heavy fuel oil that has to be heated. October 2008 was very unusual – in that one month the Vermont Underground Storage Tank program learned of three instances in which one wall of a double-wall tank failed. But in none of these cases did any gasoline, diesel fuel, or fuel oil escape to the environment.

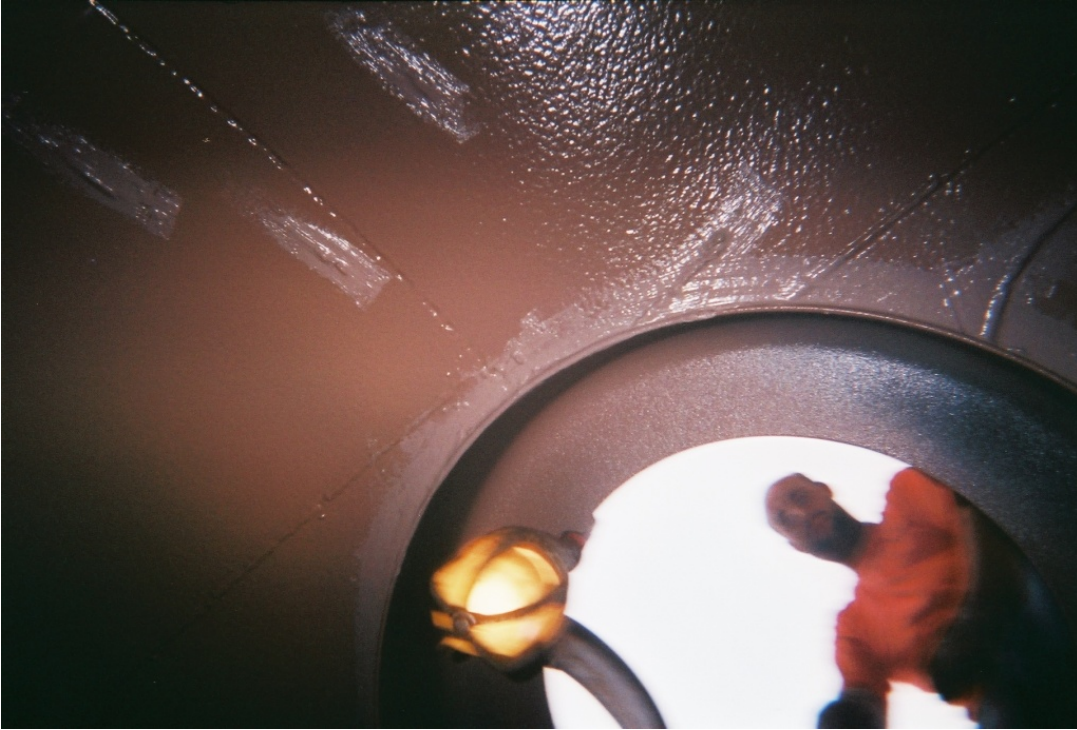
Are tanks the only source of problems at gas stations and mini-marts? No; buried piping, tank-top fittings, and mistakes during delivery also cause problems, but those issues are subjects for other articles.



The outer wall of this tank corroded beyond repair because the cathodic protection system built into this tank failed, and the high temperature of the #6 fuel oil accelerated the corrosion dramatically. This was a serious failure, but no oil leaked into the environment.



If the inner wall of a double-wall tank fails, it can be repaired by coating the interior with a fiberglass-ceramic lining. It's a messy job, but it's less expensive than replacing the tank.



Here is the completed lining, just before the tank is closed back up. The photographer is inside the tank, looking up at the tank top and the manhole that provides entry and egress from the tank. After the lining is sprayed on, the contractor has to inspect the job carefully and touch up any areas where the layer of lining material was not thick enough. Several touched up spots are visible.