A Natural History of Underground Fuel Tank Leakage

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Differential diagnosis of the physical process of leakage of fuels from underground storage tanks (USTs) has applications in both remedial engineering and in insurance law.

Most of the nation's estimated 2,000,000 underground storage tanks were gasoline fuel tanks installed in the boom years of the 1950s and 1960s. Most of these were steel and were not provided with any special protection against corrosion. As would be expected for any buried metal installation, underground tanks and pipes rust and eventually leak. Under average conditions, tank perforation and leakage develop in fifteen to twenty years. As of July 1992, the U.S. Environmental Protection Agency (EPA) reported that 160,000 of the tanks had released pollutants to the environment. In the usual case, leaks probably begin as innocuous wet spots, ultimately developing into a steady trickle of gasoline that can pollute the water supply of an entire community. On the other hand, it is not rare to have leaks or spills caused by an identifiable accident: a vehicle striking a pump and breaking off a pipe underground, a tank punctured by careless excavation, or a pump or pipe joint failure. Some spills have little to do with tankage. The author is aware of two cases in which groundwater observation wells, intended to monitor groundwater to detect pollution, have been mistaken for tank fill pipes with the result that thousands of gallons of fuel have been poured directly into the ground. Insurance coverage may depend on details of the pollution release.

Civilization, and its byways and gas stations, concentrates in valleys, which are usually underlain by potable groundwater. Groundwater pollution often results from a leak, and benzene, a constituent of gasoline, is usually the principal pollutant of concern. Benzene, along with other gasoline components—toluene, ethylbenzene, and

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xylene (the so-called BTEX compounds)—drive the cleanup standards for spills and leaks.

The many conflicting legal findings relating to "sudden and accidental" releases of pollutants underground are well known to insurance coverage counsel. Factual issues may be important in adjudicating insurance coverage for tank leaks. A recent Michigan Supreme Court case between Allstate Insurance and Upjohn Co. defined a tank leak that took place over two weeks as *not* "sudden," and underscored a trend toward interpretation of the "sudden and accidental" clause as being highly circumstantial. "The courts are looking more closely at the facts rather than handing down a sweeping decision either way," concluded the *Wall Street Journal* after the decision.

What are the relevant factual circumstances? Several types of data may be helpful in characterizing the failure of a tank, even when the failure took place years previously. Some types of evidence—eyewitness testimony, service station maintenance, and equipment replacement records—present the patterns of facts that arise in any accident; their interpretation will be obvious to experienced attorneys. Other retrospective diagnostic techniques, such as backcasting the history of contamination from results of tests of contaminant concentrations in the groundwater plume, rely heavily on expert opinion.

Corrosion-induced failures should generally be suspected for bare steel tankage with otherwise unexplained leakage beginning ten to thirty years after tank installation. Life of the average bare steel tank is about twenty years, but presence of metallic defects, salty soil, or underground "stray currents" associated with nearby buried electrical conductors, or electrical equipment defects, may accelerate the process. Examination of the failed specimen of tank or pipe may clinch the diagnosis. Tank removal records prepared by contractors or government inspectors often provide diagnostic comments on rust or holes observed in the system. In general, corrosion may be accelerated by various factors; as a process, however, it generally begins at the time the tank was installed and progresses gradually over the years.

What are the characteristics of the actual release of contaminants? Knowledge of the corrosion process and plume dating by contaminant dispersal "fingerprinting" may be telling, but in most cases characterization of both temporal and subjective aspects of corrosion-induced pollution releases will benefit from examination of tank inventory records. Routine records extending back a year before the first indication of leakage may provide decisive information on the early stages of a leak.