

# Protecting the community's health and safety

## Army tests landfill gas reduction system

The Army operated a municipal landfill on Fort Ord from 1953 until 1987. The landfill was similar to those maintained by most municipalities and, like many landfills, Fort Ord's landfill was later found to be leaking hazardous chemicals into the groundwater beneath the base. Part of the cleanup of the former Fort Ord required the closure of the former landfill and the treatment of the contaminated groundwater. The landfill closure that began in 1996 is substantially complete. A small portion remains open for consolidation of contaminated soil generated during the continuing cleanup. The closure process includes capping the landfill with a thick plastic cover to keep rainwater from reaching the landfill waste and move chemicals into the groundwater beneath the landfill. A groundwater treatment plant that has been in place since 1995 is treating the previously contaminated groundwater beneath the landfill. The Army continues to monitor the landfill closure regularly and report its findings to federal and state authorities and community members.

### The nature of landfill gas

Most landfills typically generate gas and Fort Ord's is no different. Landfill gas is chiefly composed of methane and carbon dioxide, but may also contain other gases. When landfill gas is present, the Army's concern is the exposure of humans to potentially hazardous chemicals that are contained in the gas. Though methane, the principal component of landfill gas, methane, itself is not hazardous to human health, it can be ignited at certain concentrations in the air.

The natural decomposition of the organic waste present in the landfill creates landfill gas. The more decomposition, the more gas is created. Generally, the longer waste decomposes, the less gas is generated. Because of the degree of decomposition of most of the waste in the Fort Ord landfill, the amount of landfill gas now being generated is relatively low. However, the last used (youngest) area of the landfill (Area F) contains waste that produces more gas than the older areas. Some landfill gas has been detected in the soil just to the east of Area F.

The Army's ongoing environmental cleanup program includes landfill gas. Underground probes are used to measure landfill gas in the soil, adjacent to the landfill. The probes are at depths ranging from 12 feet (the depth of the buried edge of the landfill cap) to 32 feet (the maximum depth of waste in the landfill) and spaced about every 1,000 feet. A first set of probes was installed along the perimeter of the landfill, 25 to 35 feet inside the fence line. Soil gas samples were taken in June, September and December 2000. The results detected methane migrating through the soil beyond the fence line at some locations. In April of 2001 probes were added at 18 additional locations to determine how far from the landfill the gas had traveled. The farthest from the landfill that the probes have detected gas is approximately 70 feet outside the fence line around the landfill and 280 feet from the closest California State University Monterey Bay (CSUMB) housing.

Since the probes detected landfill gas in the soil outside the landfill fence line, air monitors were used to determine if the gas was escaping into the air. Five ambient air (above ground) sampling stations were placed between the landfill and the closest CSUMB housing area. One monitoring station was placed west of the landfill to determine the chemical composition of air upwind of the landfill area. The Army conducted ambient air monitoring in October and November 2000.

### Pilot Test Up and Running

California regulations require methane concentrations to be less than 5 % or 50,000 parts per million by volume at the landfill property boundary. Measurements from the underground probes showed concentrations of methane and other chemicals that were higher than predicted and were above landfill regulatory standards. Consequently, the Army has taken action to reduce the amount of methane in the soil.

In the spring of 2001 the Army took action to reduce the landfill gas releases by constructing a pilot gas collection and treatment system adjacent to the eastern boundary of Area F of the landfill. Full time operation of the facility began on 4 June 2001. The primary objective of the pilot facility is to collect physical and chemical data, especially landfill gas flow rate and composition data that is required in order to evaluate the cost effectiveness of different treatment technologies. The design requirements can be established for a permanent mitigation system once the data is collected.

During the initial pilot test operation, the landfill gas was treated with granulated activated carbon that removed volatile organic trace constituents but did not remove or destroy the methane. Methane was vented to the atmosphere at a safe location so that concentrations did not exceed 5% at the fence line. Other treatment options will be tested during the summer/fall of 2001.

Workers will conduct additional sampling near the closest residences in the second half of 2001 after the landfill gas removal system has been in operation for a few months. By mid 2002, the Army intends to design, a permanent solution designed to lower the methane concentration in the soil gas to less than 5 percent.