

Athens-Clarke County MSWL June 12, 2009

Municipal solid waste landfills (MSWL) are used to dispose of household wastes and non-hazardous commercial and industrial wastes. In Georgia, there are 108 active solid waste landfills, and 128 closed sites with known groundwater contamination. Landfills constructed after 1979 are required, under Subtitle D of the Resource Conservation and Recovery Act (RCRA), to be designed and operated to prevent contaminant migration to the environment. This design may include liners or collection systems. Landfills constructed before 1979 may not have such environmental safeguards.

Based on the results of investigations regarding air quality near landfills, GDPH does not recommend that air monitoring be conducted at the Athens-Clarke County Landfill. Specifically:

- Monitoring current conditions will not tell us what exposures may have occurred in the past.
- The landfill is maintained in accordance with current rules and regulations.
- There is no evidence that landfills, in general, emit hazardous chemicals to air at levels that would cause adverse health effects.
- Exposure to chemicals at MSWL is likely to be to very low levels of mixtures of chemicals over a long period of time, which makes it very hard to establish whether or not there might be associations with health effects.

Exposure to hazardous chemicals from MSWLs can result from:

- Gases
- Dust
- Odors

Landfill Gases

People may be exposed to landfill gases either at the landfill or in their communities. Landfill gases may migrate from the landfill either above or below ground. Gases can move through the landfill surface to ambient air. Once in the air, the landfill gases can be carried to the community with the wind. Odors from day-to-day landfill activities are indicative of gases moving above ground. Gases may also move through the soil underground and enter homes or utility corridors on or

adjacent to the landfill. Landfill gas collection and control systems have the greatest impact on gas migration and exposures. If a collection or control system is in place and operating properly, migration and exposures should be minimal.

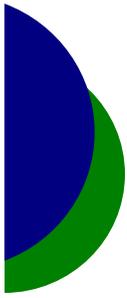
Landfill gas constituents typically found in ambient air at low concentrations are unlikely to cause adverse health effects. In addition to concerns about persistent landfill gas odors, people living near a landfill may be concerned about the health effects of exposures to the landfill gas mixture or specific landfill gas constituents, both in the short term and in the long term. As described below, odor-producing chemicals (i.e., hydrogen sulfide and ammonia) are not likely to produce long-term adverse health effects at the levels typically associated with landfill emissions. The odors associated with these chemicals can, however, cause acute (short-term) effects, such as nausea and headaches, as mentioned earlier. Acute effects from other chemicals found in landfill gas are usually produced only when an individual is exposed at relatively high concentrations. Acute effects are usually reversed when the odor or exposure ends.

Hydrogen sulfide

To date, researchers have not identified any long-term health effects associated with exposure to the low-level hydrogen sulfide concentrations that normally occur in communities near landfills. As mentioned previously, hydrogen sulfide concentrations in the air around a landfill are usually less than 15 parts per billion (ppb).

Ammonia

Studies of health effects resulting from exposure to ammonia have found that people who inhale 50,000 ppb of ammonia in the air for less than 1-day experience slight and temporary irritation. Irritation, therefore, begins at concentrations at or above the odor threshold. People exposed to 500,000 ppb for 30 minutes increase their air intake and report soreness of the nose and throat. Ammonia can be fatal when a person is exposed to 5,000,000 ppb for less than 30 minutes. This concentration is equivalent to an atmosphere containing 0.5% ammonia. A study of chronic ammonia exposure



found that people exposed to ammonia at a concentration of 100,000 ppb in air for more than 6 weeks experienced eye, nose, and throat irritation. Concentrations of ammonia in the ambient air near a landfill are expected to be well below the levels at which any adverse health effects are expected to occur.

NMOCs

The health effects of other landfill gas constituents, such as non-methane organic compounds (NMOCs), need to be considered on a chemical-by-chemical basis. It is also important to consider their possible cumulative effects. In general, levels of individual landfill gases in ambient air are not likely to reach harmful levels. In other words, low levels of landfill gases are unlikely to cause obvious, immediate health effects. However, the potential health effects from long-term exposures to low levels of landfill gases released to ambient air are not easy to evaluate, largely because exposure data are often lacking.

Dust

Airborne dust can be produced in excess from landfill sites, in the following ways. Movement is mainly due to wind or mechanically related operations, causing dust to enter the atmosphere:

- From the unpaved dirt roads to and from the site
- Soil stockpiles and bare earth
- Earthworks (excavation and embankment of earth)
- Diesel fumes from all the vehicles that attend it
- Dusty waste put inside it such as incinerator ash, asbestos and industrial powders

Atmospheric dust concentrations decrease proportional with the distance from the landfill site. When the landfill site is active, particles and chemicals may stick to the dust particles, and be carried away from the site having potential health effects. Standard controls limit the dust production from landfill sites. Spraying the waste can reduce production, and surrounding area with water. There can also be sensitive receptors located immediately next to the site to monitor levels and take appropriate measures.

Health can be affected in different ways by the dust depending on how it comes into contact with the human population. If the dust is inhaled, PM10 particles (particles less than 10 microns in diameter) cause significant respiratory health problems, particularly for those in sensitive groups, such as asthmatics. Incidental ingestion may occur through the deposition of dust on fruit and vegetables. If they are not washed sufficiently toxic chemicals may enter the body. Dermal contact may also occur which can cause irritation.

Odors

Odors are difficult to regulate and may cause or contribute to adverse health effects in exposed individuals, which discontinue when odors cease. The influence of odors on the comfort and welfare of individuals is difficult to evaluate. Odors can result in social and behavioral changes in some people. However, odor perception is subjective, and different individuals may react differently to the same type and intensity of odor. People who live near a landfill or recycling facility may become sensitized to odors and report odors as much more intense than someone who only visits the site occasionally. GDPH cannot evaluate whether landfill emissions that reportedly caused odors were present in the past at levels of health concern because no data on the landfill contaminants that might have caused the odors were collected. However, based on facility operations, professional knowledge about similar landfills, and the data available from inspection reports conducted regularly at the landfill facility since it was first permitted, it is likely that most landfills do not release emissions at levels that could cause or contribute to chronic health problems.