

## Landfill Cover Integrity Issues

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We are periodically contacted about municipal solid waste landfill (Subtitle D landfill) covers and the protection they afford from pollution by landfilled municipal solid wastes. While we have discussed these issues at length in our periodically updated review paper,

Lee, G. F. and Jones-Lee, A., "Evaluating Potential Impacts of Landfills & Landfill Pollution: Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste," Report of G. Fred Lee & Associates, El Macero, CA, January (2021).  
[www.gfredlee.com/Landfills/Landfill\\_Pollution\\_Impacts.pdf](http://www.gfredlee.com/Landfills/Landfill_Pollution_Impacts.pdf)

a number of key issues are discussed below:

With respect to questions about a standardized approach to landfill covers, we know of no standardized approach for developing municipal solid waste landfill covers beyond the US EPA's Subtitle D regulations. As discussed in our "Flawed Technology" review cited above there is a variety of approaches allowed for developing landfill covers among states. Many of the approaches being allowed are not particularly effective, especially in the long term. As we have discussed, the landfill cover needs to be effective at the time of construction and for as long as wastes in the landfill are a threat to generate leachate with entrance of water. Since landfill liner systems being allowed today, especially single Subtitle D liner systems, will ultimately fail to prevent passage of leachate out of the landfill, and since groundwater monitoring systems being allowed have a low probability of detecting incipient leachate leakage, off-site groundwater pollution by leachate can be expected to occur at landfills approved by regulatory agencies. These problems could occur within a few years or be delayed for decades, but they can be expected to ultimately occur. This is part of the "flawed" nature of Subtitle D landfills.

A key to providing the greatest protection from Subtitle D landfill systems is the design, construction, and maintenance of the cover, monitoring of cover integrity, and early detection and repair of breaches within the cover system that allow entrance of moisture into the landfill. Breaches in the landfill cover are not detected so as to prevent entrance of moisture into the landfill; rather breaches in the cover are only detected once moisture has already entered the landfill, leachate has been generated, and the leachate appears in the leachate collection system, provided that that system operates as intended. At one time leak-detectible covers were proposed that could have significantly improved the ability to reduce entrance of moisture into Subtitle D landfills. That approach was not adopted by the US EPA or state regulatory agencies because it would increase the cost of landfilling of municipal solid wastes, which would be opposed by the public. This is especially true since most of the waste-generating public are not,

themselves, adversely impacted by groundwater pollution at Subtitle D landfills; rather it is only those in the vicinity of landfills, typically sited in "remote" areas, who have to live with the impacts of landfills. This is also part of the "flawed" nature of Subtitle D landfills.

Many different kinds of materials are allowed to be used above the plastic sheeting layer in Subtitle D landfills. What goes on top of the plastic sheeting is not a particularly critical component as long as it does not adversely affect the integrity of the plastic sheeting.

Another fundamental "flaw" in the Subtitle D technology is the failure to ensure that adequate funds are available to monitor and maintain the landfill cover and other systems for as long as the wastes have a potential to generate leachate when contacted by water. This time period could be hundreds of years or more.

For additional information on issues of protection of public health and environmental quality from impacts of municipal solid waste landfills, especially as provided for in Subtitle D regulations, consult our review paper:

Lee, G. F. and Jones-Lee, A., "Evaluating Potential Impacts of Landfills & Landfill Pollution: Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste," Report of G. Fred Lee & Associates, El Macero, CA, January (2021).  
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