

Mitigating Landfill Odors with a Non-Reusable Geo-synthetic Film as Alternative Daily Cover

While there is no one solution to mitigating odors at landfills, there are steps to be taken. A non-reusable geosynthetic film for ADC is certainly worth vetting at your site if you find yourself receiving large numbers of odor complaints.

■ By J.D. Mohr

Imagine this, it is 5:00am Monday morning and you are a manager at a MSW (municipal solid waste) landfill. You wake up to a text from your lead operator informing you that the primary compactor will not start, and the D8 dozer is running poorly with little to no power. There is a line of trucks backed up to the insanely busy main road causing a traffic hazard and the scale operator is running late for work. It is go time—you grab your keys, warm up the truck and speed off to start solving problems. As you approach the landfill, ready to dive in, your phone rings. The new subdivision built to the East of the landfill has called in another odor complaint. Just by chance the DEQ has scheduled a surprise visit today and last night you had the windstorm of the century. Does this sound familiar?

Why is Mitigating Odor Such a Critical Task of Landfill Management?

While the above may be an extreme example, it is not that far-fetched from the daily challenges one may face managing a landfill. Of the many problems at the landfill, none is more public than an odor

complaint. Odor complaints can spiral out of control and have been the demise of numerous landfills across the U.S. Owners and engineers scramble to find a solution and often spend large sums of money trying to bring runaway negative propaganda back to manageable reality. With that said, it is imperative to the existence of the landfill that emissions be identified and mitigated to stay on good terms with those in close proximity to the site.

EPI's ECD 800 deployer is shown traversing a fresh film deployment next to the previous days deployment. The ECD 800 can float freely on top of the film without compromising the integrity of the film.



Davis Landfill's skilled operator lines up with film panels to create an overlap of the film for a complete barrier between the waste and environment.



EPI's ECD 800 starting a new film panel run up a working face slope at Davis Landfill. The ECD 800 is capable of deploying film on 3 to 1 slopes.

Davis Landfill

Wasatch Integrated Waste Management Districts Davis Landfill is located in Layton, UT. It is a pristine setting surrounded by nature, mountains and new homes. Proactive Landfill Manager Preston Lee is tasked with managing odors at the landfill. This is a high-profile landfill coexisting with many commercial businesses and residential neighborhoods close by. Since December of 2017, Davis Landfill has started using the non-reusable geosynthetic film for daily cover. In that time, Lee's noticed a substantial reduction in odor complaints.

Davis Landfill Management inspects deployed film covered with snow from the previous days operations.



Where is the Odor Coming From?

Odor at the landfill is commonly a result of hydrogen sulfide, volatile organic carbons (VOCs), odorous mercaptans and water vapor escaping from the hill. Identifying where it is coming from can be a tricky proposition. Is the odor a result of too few gas collection wells? Or maybe it is the 100 tons per day of sludge you receive? Or maybe it is not from your site at all; you might have a compost facility and animal rendering plant all within a mile of the landfill. It really depends on whom you are asking. Even to the trained nose of a landfill manager, he can struggle to draw conclusions. Let's focus on one of the areas you have some control over—daily cover for the active working face.

Odor: No Silver Bullet

Understanding that you are faced with multiple sources of odor generation at the landfill, you need to take a multipronged approach. You have already installed caps and beefed up the gas collection wells. Also, you have installed a new odor neutralizing system that smells like cherries (or fresh cut grass if you are not into cherries). Things are better but you are still having odor complaints periodically. So, what else is out there for odor control? While there are plenty of other tools on the market, for our purposes we are going to focus on the use of an ADC (alternative daily cover) referred to as a non-reusable geosynthetic film.

How Does Film Contain Odor Emissions?

Polyethylene is technically an "impermeable" material, with no interconnected pores through which gas and fluids can flow. Fluid molecules move slowly through polyethylene film as a vapor phase via molecular solubility and diffusion, in a phenomenon known as permeation. Water vapor droplets will collect on the underside of the film that otherwise would dissipate into the environment. In other words, the landfill gas will flow much more freely through soil barriers as it tends to wash away with weather, shift and crack over unconsolidated sub-surfaces such as landfill waste.

Daily cover soil can leave openings where soils tend to stick to vehicle tracks and lift off the waste exposing it intermittently through the cover. This is referred to as "flagging", an issue that becomes non-

existent with the use of film. Additionally, the film is buried along with the waste and provides a continuous barrier between the waste and the environment even during filling. When peeling back soil or removing other types ADC barriers in the morning, a significant emissions event ensues. When this gas is released it almost invariably will find its way into the neighboring areas at a high concentration.

What Does Leachate Reduction Mean to Odor?

When properly deployed, the film creates an impermeable barrier that sheds rainwater thereby minimizing leachate. Why is this important to odor control? Premature generation of leachate leads to increased odor emissions due to organic wastes decay into odorous compounds.

Trade Offs

As with anything, you have trade-offs when purchasing an ADC. Each site has unique variables that dictate how it performs daily cover. You may have more free soil inbound than you know what to do with. Or, maybe you are constructing a new cell and need to get rid of the spoils so cover seems like a logical option. Everyone agrees, filling up precious expensive landfill airspace with dirt is not optimal, but we sometimes operate off of different financial pressures that make dirt the only option. In the event of odor issues, you might have to make some tough operational decisions that modify your budget in order to meet odor mitigation goals.

Taking the Steps

While there is no one solution to mitigating odors at landfills, there are steps to be taken. There is no coincidence that garbage bags are made from polyethylene since they have superior containment capabilities. A non-reusable geosynthetic film for ADC is certainly worth vetting at your site if you find yourself receiving large numbers of odor complaints. | **WA**

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