

Municipal Solid Waste Landfill Design

Subtitle D landfills, like the Twin Chimneys Landfill, use technical design methods including placing wastes in units lined with geo-textile materials and equipped with leachate collection systems to help prevent the migration of decomposing wastes and rainwater into the underlying groundwater system.

1. Clay Liner. 24" layer of compacted clay liner with a permeability of 1×10^{-5} cm/sec.
2. Geosynthetic Clay Liner. Rolls of factory fabricated thin layers of bentonite clay sandwiched between two geotextiles or bonded to a geomembrane. Structural integrity is maintained by needle punching, stitching or physical bonding. This layer underlies the geomembrane.
3. 60-mil HDPE Geomembrane Liner. This liner is placed at the base of each landfill unit. This material is designed to prevent leachate (liquid generated by the decomposing wastes and rainwater) from migrating from the bottom of the landfill into the underlying groundwater.
4. Net Composite Fabric. This liner ,along with the manufactured sand layer, allows the transmission of leachate to the leachate collection system.
5. Sand Layer. 24" layer of sand that allows the leachate to migrate to the top of the liner system where it will flow into the leachate collection system.
6. A system of slotted pipes is placed at the base of each unit to collect leachate.
7. #57 wash stone. This stone surrounds the leachate pipes preventing particles in the leachate from clogging the perforations in the pipe.
8. Filter Fabric. This fabric provides a barrier between the sand and wash stone preventing the sand from filling in the void spaces in the wash stone.
9. The leachate is pumped to holding tanks and eventually pumped into tankers and transported to Western Carolina Regional Sewer for treatment and disposal.
10. Monitoring wells and installed around the perimeter of the landfill and sampled bi-annually to ensure the water quality is maintained.

CONCEPTUAL LANDFILL DESIGN CROSS SECTION

