

## 3.7 Grading for Water Management and Erosion Control

*The landfill should be graded to promote water runoff. Berms and cover material should be graded to reduce erosion, preserve the stability of the landfill, and prevent ponding. (18 AAC 60.390, 18 AAC 60.243)*

The grade or slope of a landfill plays an important role in keeping the landfill stable by keeping berms and cover material in place. When done correctly, it also prevents water from ponding near the working face or anywhere on site. If a landfill is too flat, water will pool, and it is a challenge to appropriately manage run-on and run-off. If any part of the landfill is too steep, water running off the slope will carry gravel or dirt resulting in erosion of the landfill.

### **What is grading?**

Grading creates a contoured surface at the landfill to prevent ponding and direct water away from the waste. The process of grading will fill in low spots and remove high or unstable spots. Grading can be achieved with various sizes of heavy equipment, anything from a small bucket on a skidsteer to a full-sized bucket on an excavator or a dozer with a blade

### **How to grade a landfill:**

Add material where needed to raise the ground surface and smooth out the area to maintain a gentle slope that will direct water off the site. Compacting the material by running the heavy equipment over it will help the new material settle and will assist in determining where material needs to be added or taken away to achieve a gentle slope. Grading should work with the existing slope of the land if possible.

### **Maintaining a grade:**

Waste decomposes at different rates depending on the type of waste and the local environment. Waste buried up to a decade ago may create a low spot as it decomposes causing water to pond at the landfill. Placing material onto the low spot to build it back up so it is similar in height to the surrounding land is one example of maintaining a grade. Another example is identifying how water runs off the landfill site and grading the surface to ensure that the water drains to a particular spot such as into a drainage ditch. In general, surface water should drain away from the waste disposal site.

### **Helpful Tips:**

- Fill the landfill from the highest point to the lowest point, whether it is a trench-and-fill or an area fill.
- When applying cover to the working face, make sure that the cover material is compacted and sloped (2 or 3 degrees, very slight slope) to direct water away from the waste. However, be careful that the slope is not so steep that all of the cover material washes away with rain or snow melt.

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- If the landfill is located on a hillside or at the bottom of a hill, then berms or drainage ditches are required on the uphill side of the landfill to keep any water from flowing onto the site.
- Berms on the outside of the landfill should be sloped to keep runoff from rain and snow melt from washing them out.
- Running tracked equipment up the berms called “track walking”, helps to reduce erosion and keeps the soil material in place as designed.
- Plan ahead by grading the landfill in the fall so spring snow melt will be directed away from waste disposed of during the winter months.
- The side slopes within a trench-and-fill should be constructed to prevent cave-ins, which can be a safety hazard.
- Design and construct simple drainage controls in the landfill to direct water away from the waste. Examples of drainage controls include:
  - A trench filled with gravel at the base of the berms.
  - Shallow drainage ditches to direct water out of the landfill.
  - Diversion ditches or berms to prevent water from flowing into the landfill.

## Examples:



*Cover material at the working face graded to promote water drainage away from the waste. Water is draining away from the working face following the arrows.*

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*Engineered drainage system to prevent water from running onto the waste from the berms surrounding the facility.*