PROPER LAND TREATMENT OF PETROLEUM PRODUCT CONTAMINATED SOILS
North Dakota Department of Environmental Quality
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Article 33.1-20 of the North Dakota Administrative Code regulates the operation and construction of municipal waste landfills, inert waste landfills, and industrial waste landfills. In response to numerous requests for guidance and information on proper treatment of petroleum-contaminated soils, the Department has prepared these guidelines. Petroleum-contaminated soils are not routinely allowed into municipal waste landfills. Any transport, storage, or treatment of such materials in regulated landfills or anywhere in the state must be properly coordinated and approved by the Department.

It is important to remember that land treatment activities use unlined surface soils which are subject to direct contaminant losses via air, water, or food chain; consequently, facility management has a substantial impact on both the treatment effectiveness and the potential for contamination. Improperly designed or managed land treatment units could cause various types of human health problems or environmental damage. Land treatment relies on volatilization and soil microorganisms to break down or "eat" the contaminants. Soil microorganisms, abundant in topsoil, require warmth, nutrients, moisture, and air (tillage) to actively break down oil-based contaminants. As appropriate, a culture of microorganisms and nutrients may be added to the soil to facilitate the breakdown processes.

Disposal/Treatment Practices for Petroleum-Contaminated Soils

1. Contaminated soils shall be treated only at properly operated, geologically suitable landfills as approved by the Department. (The Department maintains a list of such sites.) At their discretion, owners/operators of such landfills can refuse contaminated soil.

2. As little degradation occurs during the cold months, it is prudent to stockpile contaminated soils until the growing season. The stockpile area should be constructed to be as small as practical and to control surface water run-off and run-on.

3. A nearly level to gently sloping area of the landfill where soil will be undisturbed for several months should be selected. This can be a reclaimed area, closed area, or area yet to be landfilled. Soils need to be clayey with a topsoil layer present or topsoil added.

4. Surface water controls are necessary around storage and treatment areas. These controls must be adequate to control run-off /run-on at the site. Ditches or berms upslope of the site should divert water inflow around and away from the treatment area. Berms, ditches, or impoundments downslope at the site must be adequate to contain and store surface water run-off during heavy precipitation events. Surface water run-off must not be allowed to cause degradation of any off-site streams, rivers, lakes, etc.

5. Prepare the treatment area by tilling to a depth of six inches. Additional nutrients (fertilizer) may be required for efficient degradation. Manure can be used. Manure provides nitrogen and organic matter which enhances absorption of the waste constituents. The soil should be tested to determine any fertilizer needs.

6. Contaminated soils should be spread in a uniform layer no thicker than six inches over the area and then tilled into the prepared surface.

7. The disposal facility should plan on allowing at least a 45-day residence time for the soil to be treated at the site. Factors modifying the treatment time period area: season, soil temperature, soil fertility, soil moisture, amount of tilling, degree of contamination, and waste characteristics. Maintaining soil moisture near field capacity is important. The treatment area may require daily irrigation during dry weather.

8. The material should be tilled, at a minimum, once every two weeks until any noticeable odor is no longer present.

9. Properly land farmed materials may be included in a stockpile for use as final cover for closed portions of the landfill site, or the area could be left in-place and planted to grass to control erosion.

10. Quantities of 20 cubic yards or less containing no free liquids, received in a 4-week period and that can be spread to less than one-half inch thickness, may be landspread without tillage. Cumulative quantities in excess of this amount received in the aforementioned time period will be handled as instructed in steps 1-9.