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Sanitary Landfills... the Situation and Legal Requirements

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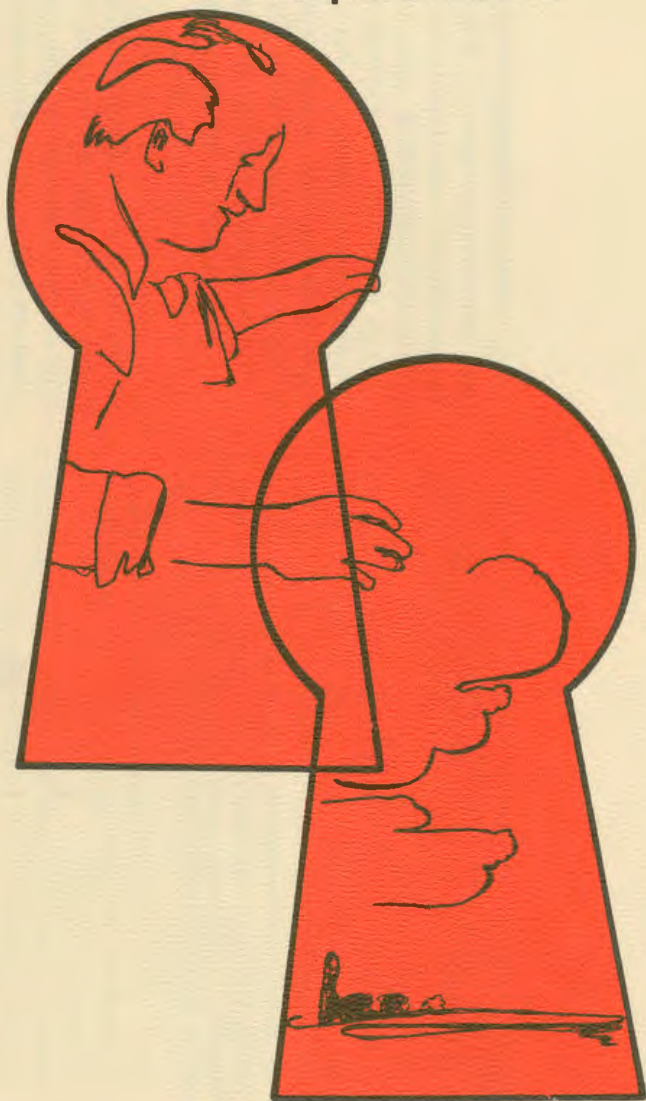
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Sanitary Landfills ... the Situation and Legal Requirements



Cooperative Extension Service
South Dakota State University
U. S. Department of Agriculture

Sanitary Landfills... the Situation and Legal Requirements

By F. F. Kerr, Extension water resources specialist

Someone said "solid waste is anything you cannot pour that you do not want anymore." It includes paper, containers of all kinds, garbage, dead animals, trees and other vegetative matter, leftovers from construction work, old lumber, old tires, hardware, old furniture, glass and just about anything else you want to get rid of.

It breaks down about as shown in Figure 1. Note the very large percentage that is made up of paper. Since burning is no longer permitted under the air pollution regulations except in a few cases, and where temporary variances have been approved by the Department of Environmental Protection, the disposal of paper has become more troublesome.

Magnitude of the Problem

Disposal of solid wastes in South Dakota is a small problem as compared to large metropolitan areas, but even here the amount of waste generated is an awesome volume.

Total wastes produced divided by total people in an area gives a basis for planning purposes. Using these figures, it can be assumed that each person will produce from 4 to 6 pounds of solid wastes per day, depending on the concentration of commercial and industrial enterprises in the area.

Since South Dakota is not heavily commercialized or industrialized the figure of 4.5 pounds per person per day, or about three fourths of a ton per person per year, seems reasonable.

Assuming further that the disposal method will be a sanitary landfill and converting tons to cubic feet, every 1000 people will generate enough compacted wastes in one year to cover a little over one acre of land with waste one foot deep. This total amount must be planned for since air pollution regulations prohibit open burning as a method of reducing volume.

Legal Requirements

A solid waste disposal law has been passed by the South Dakota Legislature. Some of its key provisions (1) provide for administrative and regulatory functions through a department of state government, (2) require the administering agency to adopt regulations, (3) provide for a permit system for qualified disposal facilities, (4) require each county and municipality to submit a plan for disposal of solid wastes, (5) permit counties and cities to submit joint

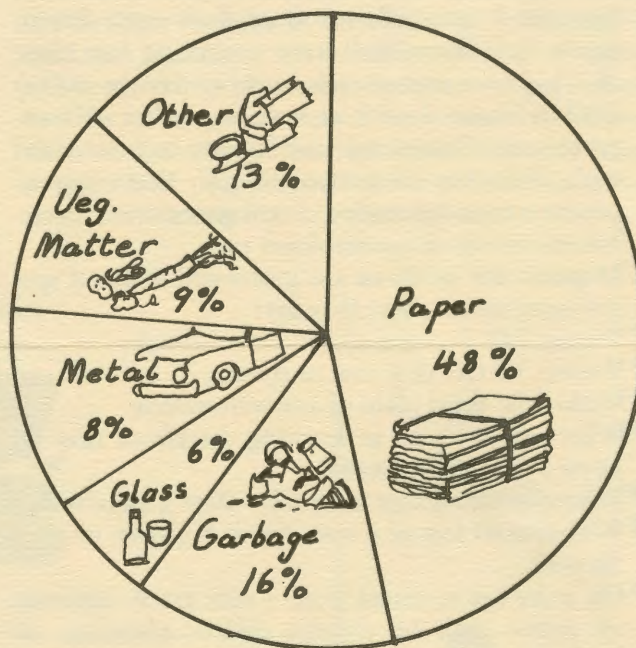


Fig. 1. The largest percentage of solid waste is paper.

or area plans, and (6) permit farmers or ranchers to dispose of solid waste generated from normal farming operation on their own lands.

A solid waste disposal regulation was officially adopted by the Department of Environmental Protection (the administering agency) in 1973. Main provisions of the regulations, exclusive of those pertaining to incineration, are tabulated below. Summary of incineration regulations has been omitted since the use of the incineration disposal method in South Dakota is unlikely.

1. **Collection** of solid wastes is the responsibility of local governments. They must determine frequency of collection and service charges. Collection vehicles must be readily cleanable and capable of controlling leakage or spillage. Collection must be frequent enough to avoid nuisance. The interval shall not exceed one week. Local governments may contract with an approved private collection firm or provide their own public utility.
2. **Storage** between collection dates is the responsibility of the person or firm generating the wastes. Containers for putrescible wastes must be nonabsorbent, watertight, rodent proof, easily cleanable and have a fly tight cover. Collection, storage, transport and disposal of toxic or hazardous wastes must have special approval.

3. **Resource recovery** (recycling) operations may be employed if markets warrant it.
4. **Sanitary landfills** are an approved disposal method. Each site must have an all-weather access road; be fenced and have a lockable gate; be well drained; have excavating, compacting and covering equipment to distribute refuse in two foot layers and compact it into cells no more than eight feet in depth. Cell layers shall have a working face slope of 3:1. At the end of each working day the cell(s) shall be covered with at least six inches of compacted soil. Completed landfills are to be covered with 24 inches of compacted soil. Scattering of papers is to be controlled. Local government determines the use of a completed site.
5. **Disposal site locations** are prohibited without special permission where they are:
 - Within 1000 feet of a lake, pond or slough.
 - Within 300 feet of a river or stream.
 - Within the flood plain of any watercourse.
 - Where solid wastes or leaching therefrom may be carried into surface water.
 - Where leaching may adversely affect groundwater.
 - Within 1000 feet of a state trunk highway or public park.
 - On a site not screened from a state trunk highway or public park by natural objects, plantings, or fences.
 - Where the lowest portion of the fill is less than 6 feet above the usual high groundwater table.
6. **Permits** must be obtained before constructing or operating a solid waste disposal system. In the case of a sanitary landfill the application must be accompanied by a map showing land use and zoning within ¼ mile of the site, a report showing population and area to be served, anticipated type, quantity and source of wastes, geologic formations and groundwater elevations, source and characteristics of cover material, data on groundwater contamination from observation wells, and provisions to treat leachate prior to discharge into receiving waters. (See regulation for detailed requirements and exact wording.)
7. **Permits are not required** for sites used by not more than three family units if there is no organized collection system available to them; however, the sites must be maintained in a nuisance free manner. The same applies to a farm where only crop or animal wastes are concerned.
8. **Inspections**, as necessary are to be made by the administering agency during construction or operation of sites and upon closing of completed or abandoned disposal operations.
9. **Timing** for submission of plans and implementation of the solid waste management systems are given in Table 1.

Table 1. Deadlines to submit plans

Government Unit	Date for Submission	Date for Implementation
Counties		
with population 10,000 or more	July 1, 1974	July 1, 1975
with population 5,000 to 10,000	July 1, 1975	July 1, 1976
with population below 5,000	July 1, 1976	July 1, 1977
Municipalities		
with population 10,000 or more	July 1, 1974	July 1, 1975
with population 4,000 to 10,000	July 1, 1975	July 1, 1976
with population below 4,000	July 1, 1976	July 1, 1977

Approved Methods of Disposal

Approved methods of solid waste disposal include incineration and sanitary landfills. Each is described briefly below. Recycling is also discussed although this is a recovery rather than disposal method.

Incineration is controlled burning in a facility specially designed for the purpose. Pollution control devices on the stack remove all undesirable elements from the smoke. Fuel is injected into the burners to raise burning temperatures.

The disadvantages of incineration are the very high capital investment and operating costs. Neither is incineration a complete disposal method, since a residue remains that must be disposed of by another method.

Incineration has practical application in large metropolitan areas where land for disposal use is limited and where reduction of waste volume is important.

Since South Dakota does not have large metropolitan areas and since land for disposal purposes can be found, incineration is not considered a practical or economical disposal method.

Recycling, since it is considered a recovery method, is not an approved method of disposal.

Almost all waste has a potential for recycling, and it is physically possible to recycle it into many usable materials such as building materials, animal feeds, energy sources and reuse in its original form. The research problem is largely one of methods for doing this economically.

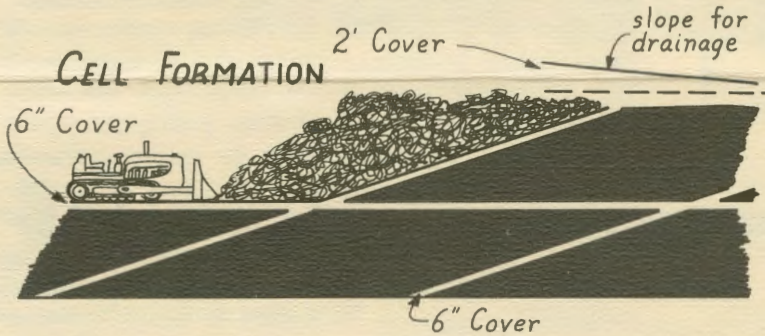
There are several recycling centers in the state that attempt to collect and recycle specific items such as aluminum, glass and paper.

Their efforts are highly commendable, but what they are able to dispose of for reuse constitutes such a small percentage of the total amount generated that it has little effect on volumes delivered to the area's disposal site.

The biggest recycling success story in South Dakota is the crushing of old car bodies so that the metal can be economically reused. Many South Dakota communities have active crushing programs. Much more will probably be done in the future.

Sanitary landfills are an acceptable method of solid waste disposal. Sanitary landfills are defined as "a disposal facility employing an engineered method of disposing of solid waste on land by spreading the wastes into thin layers, compacting them to the smallest practical volume and covering with soil at the end of each working day."

Each day's accumulation of compacted and covered waste is called a "cell." Compacting and covering each day removes the rat, odor and health problem characteristic of the city dump.



The sanitary landfill is the only complete disposal method. There is no residue. Even large objects such as stoves, water heaters and car bodies can be crushed with heavy equipment and buried, but since commercial crushers have become available these are usually stockpiled to await the crusher.

Blowing papers require constant attention of landfill operators. Some mix small amounts of soil with the waste during spreading and compacting to help stabilize light materials. Woven wire fences around the landfill and portable woven wire fences that can be moved to the downwind side of the working area are helpful. Ordinances that require people served to put light materials in degradable plastic bags before they are picked up by collection trucks help also.

Disposal Service Areas

Although the sanitary landfill is the least expensive disposal facility to set up and to operate it would still be quite a financial burden for every small town to operate one, own the necessary heavy equipment and acquire land for the site.

As noted under Legal Requirements section of this fact sheet, it is permissible for counties and/or towns to submit joint plans where several such entities would deliver to a common disposal site.

Figure 2 shows schematically how this might work. Towns A, B and C, city D and parts of "your county" and "my county" might submit a plan calling for all entities to deliver to a disposal site at Y.

Site Y would have to meet all the requirements of location noted under the Legal Requirements section of this fact sheet. In addition to legal requirements, the location of point Y would also be influenced by road nets leading to it, availability of land, industries to be served and proximity to centers of population.

One of the governmental units would be responsible for operation of the disposal facility with others paying their proportionate share of costs based on population or some other equitable basis.

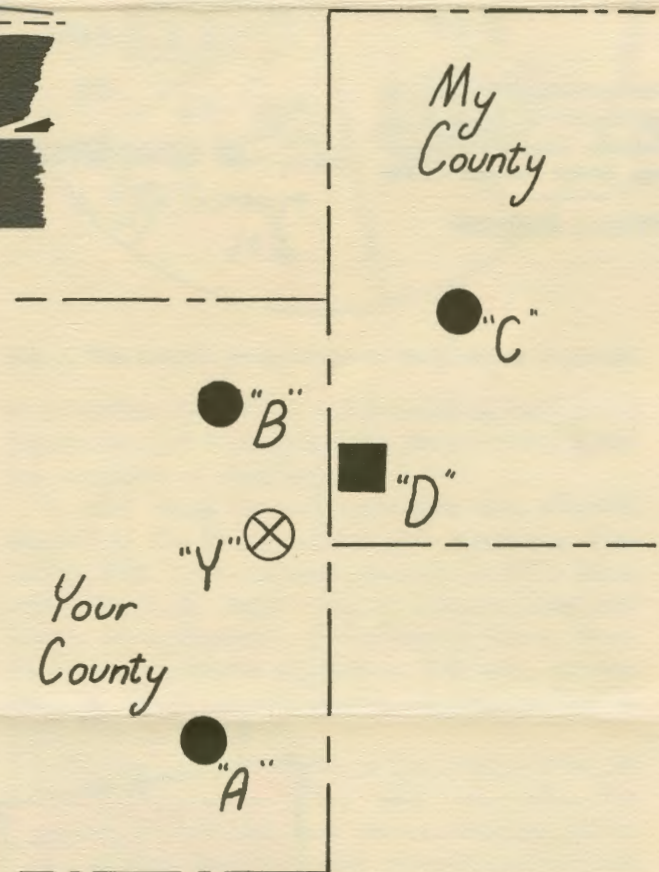


Fig. 2. A single plan for one sanitary landfill to serve more than one governmental unit can be submitted. This makes it economically possible for small towns and rural areas to meet legal requirements.

For additional information, see FS 613, Sanitary Landfill Site Selection and Operation, and FS 614, Costs and Returns of Solid Waste Disposal in Sanitary Landfills.

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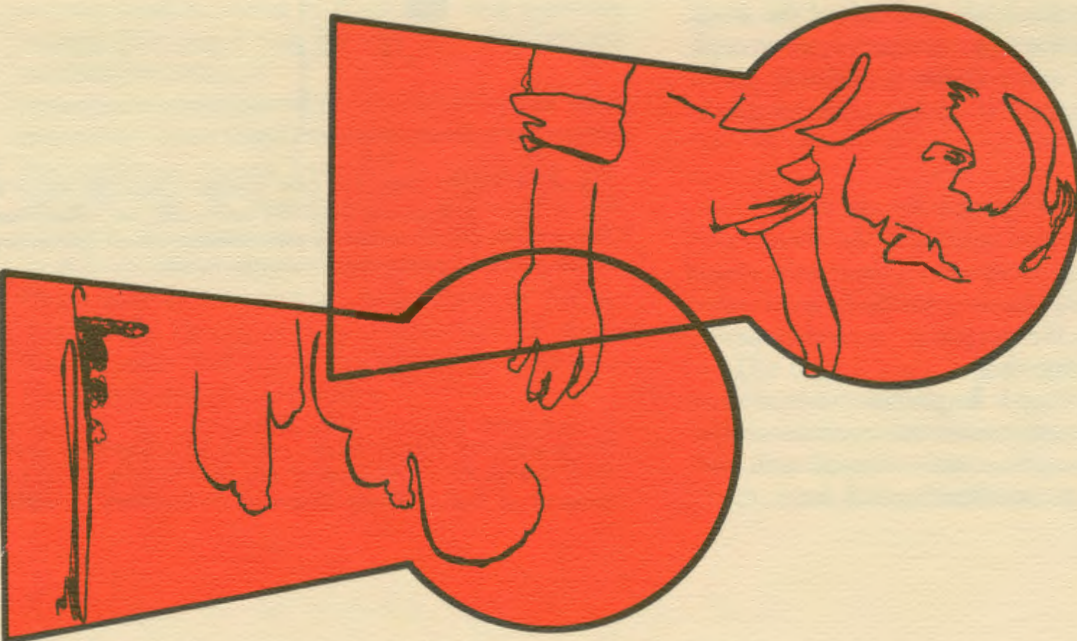
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