CORNELL WASTE MANAGEMENT INSTITUTE

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The Beneficial Uses of Biosolids/Sludge

How Do We Manage Sludge?

Sludge is the material remaining after wastewater treatment processes. Since the 1972 Clean Water Act established minimum treatment requirements for municipal wastewater, communities have faced a doubling of the amount of sewage sludge they produce annually. This has led to intense discussion about what to do with sludge. How can it be beneficially used without threatening human health or the environment?

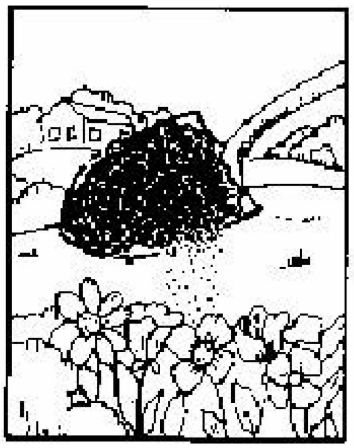
State and local authorities are enforcing stricter regulatory standards and mandating better management practices for safe sludge management and use. This situation has local governments searching for safe, economical sludge management options. Both economic and environmental factors influence the selection and implementation of any municipality's sludge use or disposal plan.

Traditional sludge disposal methods are becoming more complex and expensive. In some cases, they are banned by law. Ocean dumping, the main disposal method for many coastal areas was banned by the 1988 Ocean Dumping Ban Act. Presently, sludge use and disposal options include land application, marketing of sludge products, landfilling and incineration.

Beneficial uses take advantage of the nutrient, soil-enhancing and fuel properties of sludge, which have been demonstrated through laboratory analyses, research studies and field tests. The nutrient content of sludge-derived products is comparable with other fertilizers. Physical characteristics of soils, such as water-holding capacity, improve when sludge or composted sludge is added. However, since all sludges contain potentially harmful contaminants, beneficial uses must be balanced against acceptable risks for human health and environmental impacts.

When the sludge is dried and pelletized it makes a good fertilizer or fuel. Heat-dried sludge has almost the same heat value as low grade coal and can be burned to produce steam or used as a fuel to generate electricity. Promising new technologies such as bioconversion of sludge into useful products like methane, acetate, ethanol and butyrate are under development.

Chemical fixation is a fairly simple sludge management process that uses other materials, often waste products themselves, to chemically stabilize various sludge components. Chemically stabilized sludges can be used to reclaim strip-mined lands and



gravel quarries and if the quality is high, as a growing medium or soil additive. Chemical additions such as lime kiln dust can provide additional soil benefits such as raising soil pH. Where quality is less acceptable, the final product may be mixed with soil for use as a daily landfill cover and as the final capping material for a landfill. This is an attractive use for sludge because it can amount to considerable cost savings over using topsoil. However, since all sludges contain potentially harmful contaminants, beneficial uses must be balanced against human health and environmental limitations.

FACT SHEET 6

"Production of Sludge"
"Characteristics of Sludge"
"Beneficial Uses of Sludge"

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