AGRICULTURAL BENEFICIAL USE OF SEWAGE SLUDGE

ENRICHING SOILS THROUGH RECYCLING
Keeping Pennsylvania’s farmland productive requires the yearly replenishment of the organic matter content and nutrient levels in the soils. An effective way to do this is by applying sewage sludge directly on the farmland. Sewage sludge is nutrient-rich organic solids that can be applied to improve, replenish, and maintain productive soils while providing nutrients required for crop growth.

About 75 percent of all sewage sludge generated in Pennsylvania are reused for land application, particularly in agricultural production. They also are used to reclaim land stripped of vegetation by construction activities and mineral strip mining.

The land application of sewage sludge is viewed as the reuse or recycling of a useful resource. When managed properly, land application is safe for the environment and protective of human health.

CREATING SEWAGE SLUDGE
Permitted wastewater treatment facilities process wastewater generated from domestic and industrial sources. This processing provides two products, clean water and sewage sludge. The clean water is returned to the environment. The sewage sludge, which is generated by nature’s own process of naturally decomposing organic material, are rich in organic material and nutrients and can be recycled to the soil to fulfill a needed function.

PREPARING SEWAGE SLUDGE
The preparation of sewage sludge actually begins before the wastewater reaches the treatment facility. Local pretreatment programs monitor incoming waste streams to ensure their recyclability and compatibility with the treatment process. Next, the wastewater treatment facility cleans the water by removing the solids through physical, chemical, and biological means. These solids consist of soil particles, nutrients, trace elements, pathogens, and organic material. The solids are stabilized to eliminate objectionable odors and conditions that attract vectors. Most pathogenic (disease causing) organisms are destroyed during the wastewater treatment and stabilization process.

ENSURING ENVIRONMENTAL SAFETY
After sewage sludge are prepared, they are analyzed to ensure that they meet the high quality standards for agricultural utilization established by DEP and the United States Environmental Protection Agency. Sewage sludge are analyzed frequently for pathogens, nutrients, and other trace elements. Sewage sludge quality is continually monitored on an on-going basis.

To determine whether sewage sludge can be applied to a particular farm site, an application for the sites suitability must be completed. The application examines the distances to surface and groundwaters, water supplies, soil characteristics, slopes, vegetation and crop needs.

Nutrient management planning ensures that before sewage sludge is land applied the operation is consistent with the farm’s nutrient management practices. The sewage sludge application rate is specifically calculated to match the nutrient requirements of the particular crop.

Anyone wishing to use sewage sludge for land application must obtain a permit or beneficial use approval from DEP. Site operations are monitored by both DEP and the permittee. The permittee must submit annual reports to DEP which include an annual soil analysis, as well as nutrient, chemical, and pathogen analyses of the sewage sludge used for land application.

BENEFITS OF AGRICULTURAL USE
The land application of sewage sludge, that meets the standards, reduces the dependence on landfill disposal or incineration.

The Department has permitted more than 1,500 Pennsylvania farms to use sewage sludge. Farmland application of processed sewage sludge has both economic and agricultural advantages. Nutrients found in sewage sludge such as nitrogen, phosphorus, and potassium and trace elements such as calcium, copper, iron, magnesium manganese, sulfur, and zinc, are necessary for crop production and growth. Use of sewage sludge reduces the farmer’s production costs and replenishes the organic matter often depleted through modern agricultural practices. The organic matter improves soil structure by increasing the soil’s ability to absorb and store moisture.

In addition, the organic nitrogen found in sewage sludge is used very efficiently by crops because it is released slowly throughout the growing season. This enables the crop to take it up as the crop grows. This efficiency lessens the likelihood of groundwater pollution of nitrogen. The figure below illustrates why organic
nitrogen sources such as those found in sewage sludges are well suited for crop growth.

DISPOSING SEWAGE SLUDGE

Not all sewage sludge are suitable for land application. Sewage sludge which do not meet specific standards are not applied to land. Instead, they are disposed of through landfilling or incineration. Disposal is costly and also depletes valuable landfill space and, therefore, it should be considered an option only if the sewage sludge cannot be recycled or reused.

NITROGEN RELEASE/UPTAKE BY CORN PLANTS

HOW TO GET MORE INFORMATION

If you would like more information or are interested in recycling sewage sludge, please contact your local wastewater treatment facility, county recycling coordinator, or the Department’s Regional Offices. (See addresses and phone numbers below.) Regional Office staff can put you in contact with a facility nearest you which recycles sewage sludge.

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RECYCLING AND WASTE MANAGEMENT
P.O. Box 8472
Harrisburg, PA 17105-8472

DIVISION OF MUNICIPAL & RESIDUAL WASTE ................. (717) 787-7381
DIVISION OF WASTE MINIMIZATION & RECYCLING .......... (717) 787-7382
RECYCLING HOTLINE (TOLL-FREE) ......................... 1-800-346-4242
SOUTHEAST REGION, CONSHOHOCKEN ................. (610) 832-6212
   Bucks, Chester, Delaware, Montgomery & Philadelphia counties
NORTHEAST REGION, WILKES-BARRE ....................... (570) 826-2549
   Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike,
   Schuylkill, Susquehanna, Wayne & Wyoming counties
SOUTHCENTRAL REGION, HARRISBURG ............... (717) 705-4700
   Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton,
   Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry & York counties
NORTHCENTRAL REGION, WILLIAMSPORT ............... (707) 327-3653
   Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming,
   Montour, Northumberland, Potter, Snyder, Sullivan, Tioga & Union counties
SOUTHWEST REGION, PITTSBURGH .................... (412) 442-4000
   Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset,
   Washington & Westmoreland counties
NORTHWEST REGION, MEADVILLE ..................... (814) 332-6848
   Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean,
   Mercer, Venango & Warren counties

This fact sheet and related environmental information are available electronically via Internet. Access the DEP-DCNR Web Site at http://www.dep.state.pa.us (choose Information by Environmental Subject/choose Waste Management)