

Metro Tests Land Disposal Of Sludge

By NEIL PETERSON

The members of this Association are involved with issues that are critically linked with the number one problem we all face today, and that's the energy situation.

From Metro's perspective, as the agency responsible for public transit and water pollution control in King County, Washington, this encompasses two areas:

First is transit. The future importance of transit, with the energy crunch we're facing, is obvious. Among our most important needs is to acquire land for new park-and-ride lots and bus bases, and to get exclusive lanes and high-occupancy vehicle lanes on our highways. As more and more people turn to public transportation, these things will become more critical.

Second is land acquisition for recycling of sewage sludge. As part of our sewage treatment process, we produce 60,000 cubic yards of sludge annually. To conserve and recover energy, as well as enhance our natural resources, we need to find ways to acquire land for disposal and recycling of sludge. And, of course, this must be compatible with other land uses.

These are two concerns that you, as right-of-way agents and land-use professionals, will be dealing with. In this article, I want to address the problem of land disposal of sludge. Sludge disposal and reuse involves energy use and recovery, land acquisition and policies, open space and environmental concerns; things that affect all of us.

First, let me give some background information. As part of Metro's responsibility for water pollution control in the region, we operate and maintain a sewage collection system and five wastewater treatment plants that serve more than 800,000 people in the King County area.

Our annual budget for operation and maintenance costs for the sewage treatment plants, which handle more than 170 million gallons of water per day, is about \$7 million. More than \$1 million is spent on the processing and offsite handling of sewage sludge.

What is sludge? Sludge is the by-product or residue from the sewage treatment process. When sewage is treated at one of our plants, organic material is collected from the bottom of the sedimentation tanks. This liquid material, only about three percent solid at this point, is sludge.

The sludge is then taken from the sedimentation tanks and sent through anaerobic digesters that essentially "cook" off most of the volatile or odorous portions of the material. From there the digesters produce methane gas that we use to power and heat many of our treatment plant operations. The remaining material is sent through a dewatering process that reduces the liquid content thus increasing the solids level to about 20 percent.

Sludge Disposal And Reuse

From 1966 until 1971 Metro discharged sludge in a three percent solids state from the West Point treatment plant into deep Puget Sound. But in 1971 Metro reached an agreement with the State Department of Ecology and Department of Social and Health Services to stop discharging sludge into the Sound.

Because the disposal and reuse of sludge is a national problem, Congress passed (in 1972) the Clean Water Act. It calls for the elimination of dumping sludge into navigable waters. The Environmental Protection Agency has issued draft guidelines on the land reuse of sludge that also call for the protection of public health, agricultural crops and groundwater supplies. Complying with these Federal guidelines, as you might guess, is difficult.

Metro will handle 60,000 cubic yards of digested, dewatered sludge this year. Next year it will be 75,000 cubic yards. After processing, sludge contains up to 2½ percent nitrogen and consists of mostly organic material. Since it is a potentially valuable material, it makes sense to reuse it and recycle it where possible.

Most smaller municipalities do not have the money for elaborate reuse operations.

Larger agencies like Metro, which are already confronted with important concerns over land use and public health, are now having to develop sludge reuse programs that are expensive and at times controversial. Sludge reuse may require the acquisition of extensive amounts of land. And at times it means sludge will be brought closer to the population. What we have is a very tough problem.

For the last several years Metro has been conducting extensive research on different types of sludge use programs. I'd like to break these down into three basic areas: Soil rehabilitation, agricultural or fertilizer use, and energy recovery.

Soil Rehabilitation

This area seems to hold the greatest potential for success, primarily in the area of forest land rehabilitation.

In 1973, Metro and the University of Washington began work on a project at the Pack Forest Research Station near Mt. Rainier. Our original effort at this 2,000-acre site was to experiment with both a three percent solids sludge in an irrigation type experiment and a 20 percent solids sludge in a soil amendment capacity. The clear-cut sites originally chosen for sludge were of such poor soil quality that foresters had experienced a 100 percent mortality rate in their previous reseeding attempts.

Today, seven years later, we have applied 150,000 cubic yards of sludge at the Pack Forest site. We have developed techniques for tilling sludge into the soil, pumping dewatered sludge among thinned timber stands and applying it to steeper slopes than ever before. We have learned what problems arise with sludge handling and have developed some of the most comprehensive soil and groundwater monitoring systems in the country.

While we do have some problems with the sludge applications, it appears that the annual growth rate for the forest land may be increased up to 180 percent. And while