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SP500

The University of Tennessee
Agricultural Extension Service
and
Tennessee Division of Water Pollution Control

Best Management Practices (BMPs) for Land Application of Biosolids

BIOSOLIDS RECYCLING IN TENNESSEE ★ COMPLETING THE CYCLE ★

Best Management Practices (BMPs) for Land Application of Biosolids

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With increasing costs in production agriculture, many landowners are considering biosolids as a safe, inexpensive source of crop nutrients. Many landowners have found success using biosolids and eagerly recommend biosolids to their neighbors. The use of best management practices (BMPs) by wastewater treatment plants, haul truck operators and landowners during the application of biosolids results in landowner satisfaction and good public perception.

Unfortunately, not every wastewater treatment plant is finding success with biosolids marketing and, all too often, practices have resulted in complaint generation. Just a little negative publicity can derail an application program. Consider the following factors as integral parts of a best management plan for land application of biosolids.

Factors Affecting Public Perception

Haul Routes

When considering application sites, do not forget to evaluate haul routes and timing. Loud trucks roaring past school crossings or bus stops may cause some concerns from parents. Use of exhaust brakes, exceeding speed limits and early morning and late evening hauling are all

potential complaints. **The BMP would be to avoid residential areas for all haul routes, especially before or after school.**

Trucks used for biosolids application are heavy and can cause considerable damage to roads if the same traffic patterns are used often. Some dialogue with the local traffic department before haul routes are established may help avoid future problems.

Spills

Any biosolids spilled onto highways must be cleaned up immediately. Some lime-stabilized biosolids are very slippery when wet, causing potentially hazardous conditions. Trucks hauling biosolids must be designed to prevent spillage onto roadways. Biosolids should not be loaded into dump trucks unless the truck bed is leakproof for the type of biosolids to be transported. Obviously, trucks must not be overloaded and transfer hoses must be completely emptied before entering roadways. It is mandatory that a proactive maintenance program on all biosolids application and hauling equipment are enacted and repairs are made before hazardous conditions result. A successful land application program will always pursue the goal of zero complaint generation. Review protocol for spill cleanup and reporting with regulatory agencies before the accident happens. **Remember that if a spill occurs, the BMP is to clean it up!**

Safety Concerns

Carefully evaluate all application sites, looking critically for any potential problems. For example, applying lime-stabilized biosolids near a school should not be a problem. However, if the biosolids dry and become dusty and if the wind direction changes and recess occurs while downwind of the application site, some children will probably experience burning eyes from the lime dust. Always evaluate the site and increase the border area around application sites near home sites, schools or other public areas. **Remember that the BMP for safety is to**

anticipate potential problems so they can be avoided before they occur. As application sites become more urban, more planning is mandatory.

Equipment Operation and Considerations

Successful land application of biosolids and zero complaint generation are similar goals. Having well-maintained vehicles that operate quietly, obeying all traffic laws and leaving no trail of biosolids on streets is just the beginning of a successful land application program. All vehicles should be clean and routinely washed. Remember that the next load of material a dump truck will carry may not be biosolids. For example, a load of sand hauled behind a load of biosolids may smell like biosolids if the truck bed is not washed after the last load of biosolids. If biosolids are spilled onto the vehicle during loading, hose off the vehicle before hauling to the application site. Muddy conditions are often encountered at application sites. However, mud tracked onto roadways should be promptly removed to eliminate any hazardous conditions on roadways. Because people often smell what they see, odors can be reduced by using clean equipment. Again, keeping equipment clean, cleaning mud from roadways, preventing spills, etc., all enhance community acceptance and improve the public image of biosolids recycling. Consider the following BMPs:

- **Keep haul vehicles quiet and leave no mud on the road.**
- **Encourage equipment operators to keep all equipment clean!** Daily cleaning of equipment, routine maintenance and having conscientious equipment operators will go a long way toward improving public perception of recycling biosolids nutrients.
- **Clean haul vehicle beds well before hauling other materials.**

Odor

All biosolids management plans must address odors as a potential problem. Nuisance complaints from odors are common and create an unfavorable public reaction. Potential for odors can be reduced by utilizing the following BMPs:

- **Incorporate or inject liquid biosolids soon after application to the site.** Soil absorbs moisture from biosolids, which reduces odors as the biosolids dry. Faster drying or incorporation of biosolids at the application site will result in reduced odor generation.
- **Avoid application to wet or waterlogged soil.** Obviously, wet soils will absorb little water from applied biosolids, resulting in potential odors for longer periods. Similarly, biosolids stockpiled at the application site can produce odors until all are land-applied. Minimizing the time biosolids are stockpiled can reduce odors and complaints.
- **Use proper application rates.** Over-applying biosolids can result in runoff and pools of liquid biosolids in low areas that can generate odors. Applying biosolids at an agronomic rate helps prevent these situations.
- **Isolate application sites from residential, public access and commercial areas.** Keeping application sites away from these areas will limit potential for complaints.

Soils and sites

Carefully evaluate each site for potential groundwater and surface water contamination. Areas with karst topography require additional evaluation. Karst topography is underlain by limestone bedrock that has dissolved, resulting in landscapes with enclosed drainage systems. In some areas of Middle and East Tennessee, streams drain into sinkholes, thereby creating a direct shunt to groundwater. Over-application of biosolids in these areas may result in groundwater contamination.

At biosolids application sites, consider filter strips and borders around application sites as BMPs. Consider borders or filter strips in the following situations:

- **Provide a minimum border of 100 feet around all application sites.** No biosolids should be applied in these zones between application areas and roadways, streams, fencerows, etc.
- **Provide a minimum border of 300 feet around all home sites, water wells and sinkholes.**
- **For side-discharge spreaders, <u>always</u> throw biosolids toward the <u>center</u> of the field, never toward the outside.** Underestimating how far biosolids are applied can result in roadways (and cars!) getting hit with biosolids. And each hit will probably generate at least one complaint!

Evaluating soils at the application site can help prevent ground and surface water contamination. Soils that have either a high permeability (sandy soils) or a low permeability (clayey soils) may present special application planning. Evaluating soil texture in concert with slope and topography can help ensure that ground and surface waters are protected. Sites with slopes in excess of 8-12 percent should be avoided because of runoff. Likewise, soils shallow to bedrock provide little protection from ground-water contamination and should be avoided.

When evaluating soils at application sites, also evaluate the depth to groundwater at the site. Sites shallow to groundwater provide less buffer and greater potential for groundwater contamination. Following simple BMPs for <u>all</u> biosolids applications is an effective way to recycle nutrients <u>and</u> build a more sustainable future.

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