

EXPLORE THE SCIENCE

PROTECTING NATURAL RESOURCES.

Healthy water and healthy soil aren't separate concerns - they're the same system. The biosolids land application process is built on **multiple layers of protection** for streams, groundwater, and soil.



THE SHORT ANSWER

Federal regulations, state oversight, on-site management practices, and natural processes work together to protect water resources during biosolids land application.

- 1 FEDERAL STANDARDS BEFORE APPLICATION**
Biosolids must meet EPA 40 CFR Part 503 standards for pathogens and pollutants before they can leave a treatment facility - tested and verified.
- 2 STATE-LEVEL SITE APPROVAL**
Every application site is mapped, permitted, and approved by state environmental agencies, with required buffers from streams, wells, and homes.
- 3 ON-SITE APPLICATION PRACTICES**
No application on steep slopes, frozen ground, or saturated soil. Rates are matched to the crop's nutrient needs - not over-applied.
- 4 NATURAL SOIL & SUN DEFENSES**
Once applied, sunlight, soil chemistry, and microbial activity rapidly inactivate any remaining pathogens - a final layer of natural protection.

14 years of monitoring across 33 biosolids projects, 175 monitoring points, and 1,622 water samples showed **no harmful trends in water quality** as a result of biosolids use.

— PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

THE EVIDENCE

14 yrs

PENNSYLVANIA DEP WATER
MONITORING ACROSS 33 PROJECTS

1,622

WATER SAMPLES SHOWING NO
QUALITY DEGRADATION

20 yrs

MINNESOTA WATERSHED
STUDY WITH NO ADVERSE IMPACT

WHAT THE RESEARCH SHOWS

- 1 LONG-TERM MONITORING CONFIRMS SAFETY**
A Pennsylvania DEP study tracked 33 biosolids reclamation projects over 14 years. Across 175 monitoring points and 1,622 water samples, no negative trends in water quality were found - and acid mine drainage actually improved on reclaimed sites.
- 2 LESS RUNOFF THAN OTHER FERTILIZERS**
Research published in the Journal of Environmental Quality found that runoff from biosolids-applied pastures had less pollution potential than runoff from fields treated with dairy manure, poultry manure, or commercial fertilizer.
- 3 RESTORING, NOT JUST MAINTAINING**
On severely degraded mine lands, biosolids have been used to revegetate barren ground and rehabilitate watersheds. Long-term monitoring shows water quality improvements - biosolids don't just avoid harm, they help restore damaged ecosystems.

LEARN MORE

SEE HOW IT WORKS

mabiosolids.info

SOURCES

U.S. Environmental Protection Agency, 40 CFR Part 503. · Pennsylvania Department of Environmental Protection monitoring data. · Water Environment Research Foundation, Hampton Roads study, 1993. · Dowdy et al., USDA Agricultural Research Service / University of Minnesota: Sewage Sludge: Land Utilization and the Environment, 1994. · McLeod & Hegg, Journal of Environmental Quality, 1984.