

# FINDING OF NO SIGNIFICANT IMPACT

## CHANGES IN THE SANITARY SLUDGE LAND APPLICATION PROGRAM ON THE OAK RIDGE RESERVATION, OAK RIDGE, TENNESSEE

**AGENCY:** U.S. DEPARTMENT OF ENERGY

**ACTION:** FINDING OF NO SIGNIFICANT IMPACT

**SUMMARY:** The U.S. Department of Energy (DOE) has completed an environmental assessment (DOE/EA-1042) that evaluates potential impacts of proposed changes in the sanitary sludge land application program on the DOE Oak Ridge Reservation (ORR), Oak Ridge, Tennessee. Changes in lifetime sludge land application limits and radionuclide loading are proposed, and two new sources of sewage sludge from DOE facilities would be transported to the City of Oak Ridge Publicly Owned Treatment Works (COR POTW). Lifetime sludge land application limits would increase from 22 tons/acre to 50 tons/acre, which is the limit approved and permitted by the Tennessee Department of Environment and Conservation (TDEC). With the approval of TDEC, the permissible radiological dose from sludge land application would change from the current limit of  $2\times$  background radionuclide concentrations in receiving soils to a risk-based dose limit of 4 millirem (mrem) per year for the maximally exposed individual. Sludge land application sites would not change from those that are currently part of the program. Based on the results of the analysis reported in the EA, DOE has determined that the proposed action is not a major federal action that would significantly affect the quality of the human environment within the context of the National Environmental Policy Act of 1969 (NEPA). Therefore, preparation of an environmental impact statement (EIS) is not necessary, and DOE is issuing this Finding of No Significant Impact (FONSI).

**PUBLIC AVAILABILITY OF EA AND FONSI:** The EA and FONSI may be reviewed at and copies obtained from

U.S. Department of Energy  
Public Reading Room  
55 Jefferson Circle, Rm 112  
Oak Ridge, Tennessee 37830  
Phone: (423) 241-4780.

**FURTHER INFORMATION ON THE NEPA PROCESS:** Further information on the NEPA process and DOE NEPA regulations may be obtained from

Patricia W. Phillips  
NEPA Compliance Officer  
U.S. Department of Energy  
P. O. Box 2001  
Oak Ridge, Tennessee 37831  
Phone: (423) 576-4200.

**BACKGROUND:** The U.S. Environmental Protection Agency (EPA) supports the beneficial use of municipal sewage sludge for fertilizer and soil conditioner on federal lands (56 *Federal Register* 30448). Since 1983, with the approval of the Tennessee Department of Environment and Conservation (TDEC) and the DOE, sewage sludge from the City of Oak Ridge Publicly Owned Treatment Works (COR POTW) has been applied as a beneficial soil amendment to sites on the Oak Ridge Reservation (ORR). Sludge having 2 to 3% solids is applied to ORR sites from a tanker truck at an annual rate of 4.4 dry tons/acre/year. Like many municipal sewage sludges, the COR POTW sludge contains trace amounts of heavy metals and radionuclides. However, by law, it is exempt from regulation as a hazardous substance under the Resource Conservation and Recovery Act (RCRA) and is regulated by TDEC, Division of Water Pollution Control, in accordance with Section 405 of the Clean Water Act. Results of periodic analyses of sludge application site soils and vegetation indicate that concentrations of heavy metals, organics, inorganics, radionuclides, and pathogens are below regulatory limits.

The proposed action consists of three changes in the current sludge land application program: (1) an increase in the lifetime loading limit for land application of sludge on the ORR from DOE's self imposed, conservative limit of 48 metric tons/ha (22 tons/acre) to the TDEC-permitted level of 110 metric tons/ha (50 tons/acre); (2) a change in radionuclide loading limits from 2×background radionuclide concentration in receiving soils to radionuclide concentration limits in sludge based on a dose limit of 4 millirem (mrem) per year using a TDEC-approved, risk-based model; and (3) the transport of sanitary wastewater treatment plant sludge from the DOE Oak Ridge National Laboratory (ORNL) and K-25 Site sewage treatment facilities to the COR POTW for inclusion in the land application program. DOE action is needed to reduce the costs of storing and disposing of ORNL and K-25 sewage sludges onsite and to obtain additional beneficial use of the sludges.

**ALTERNATIVES:** The no-action alternative was considered in accordance with DOE NEPA regulations (10 CFR 1021) to provide a baseline for comparison with the proposed action and alternatives. If no action is taken, ORNL and K-25 Site sewage sludges would not be transported to the COR POTW, and sludge management at these facilities would continue as currently practiced. The lifetime sludge land application limit and radionuclide loading limits would remain at current levels. As a consequence, as ORR sites reach lifetime loading limits, the COR would need to use alternative methods for disposing of its POTW sludge.

Other reasonable alternatives considered were (1) continuation of COR sludge application on the ORR combined with a DOE program for ORNL and K-25 sludge application on the ORR; and (2) discontinuation of the COR sludge application program and implementation of a DOE program for application of ORNL and K-25 sludge on the ORR. Composting, shallow land burial, incineration, and offsite disposal of ORNL and K-25 sludges were dismissed from detailed consideration because either they do not meet the immediate need for management of DOE sewage sludges, are prohibited by a regulatory agency, or do not result in the beneficial use of sludge application.

## **ENVIRONMENTAL IMPACTS:**

### **Socioeconomics**

Because additional personnel would not be needed to continue the sludge land application program on the ORR or to operate the COR POTW, a net change in employment would not be realized. The less than \$100,000 investment needed for construction of new sludge transfer stations would not impact the local economy. The addition of ORNL and K-25 sewage sludges to the COR POTW would add less than 5% to its existing sludge generation which is well below maximum treatment capacity.

### Environmental Justice

Potential impacts from the proposed action would be minor and would be restricted to the ORR. Thus, minority or low-income populations in the Oak Ridge area would not be disproportionately affected.

### Land Use

Impacts to ORR land use would be positive. Application of sewage sludge enhances the soils at specific sites, improving hay production and hardwood growth, and assisting in restoring disturbed sites to a natural state. Offsite land use would not be affected by the proposed action.

### Cultural Resources

In compliance with Section 106 of the National Historic Preservation Act, DOE consulted with the Tennessee State Historic Preservation Officer (SHPO) regarding potential impacts to archaeological, historic, and cultural resources on the ORR. The SHPO determined that no adverse impacts would result from the proposed action. Sludge application is prohibited in known archaeological and historic sites on the ORR.

### Geology and Soils

Sludge application sites are prohibited in areas with known geological features, such as sinkholes. Both positive and negative impacts to soils result from the sludge land application program. In addition to the nutrients derived from the sludge, soils also receive heavy metals and radionuclides in trace quantities. Monitoring of specific soil constituents is performed regularly as prescribed by EPA and TDEC to protect public health and the ecosystem. Hence, significant adverse effects would not be expected.

### Water Resources

Without the implementation of stringent sludge land management practices specified by EPA, TDEC, DOE, and the COR, pathogenic, chemical, and/or radiological contaminants in sewage sludge could be transported to streams, ponds, and wetlands on the ORR. Such contamination could adversely affect aquatic organisms and ultimately man through bioaccumulation in the food chain. Management practices used to minimize the potential for significant impacts include limitations on land slope, prohibition of sludge application sites in wetlands and floodplain, restrictions on sludge application during precipitation and extreme cold, and establishment of minimum buffer zones between application sites and federal and state waterways. Vegetative cover is also used to reduce site runoff. To date, surface water monitoring on the ORR has shown no evidence of significant water quality degradation. Continuation of the program, as currently implemented, would not be expected to adversely impact ORR and offsite water resources.

### Air Quality

Atmospheric emissions from sludge application are limited to aerosols generated by spraying liquid sludge on land areas. Diffusion and deposition of chemical constituents and microbes in the aerosols increases with time and distance from the application sites. Public access to the ORR is restricted, therefore, it is unlikely that humans would be affected by spray applications. Unpleasant odors from sludge have been reported from ORR application sites near public highways, but away from residential areas. These odors would be a

temporary nuisance, but they would not cause significant adverse impacts.

### Ecological Resources

Significant adverse effects to biota would not result from the proposed action. The physical presence of sludge application vehicles would temporarily disturb and displace resident wildlife. Direct mortality would be minimal. Studies on the bioaccumulation of heavy metals from sludge by plants and animals report no ill effects from slightly elevated concentrations in body tissues. Although state-listed and federally listed threatened and endangered species are known to occur on the ORR, none have been adversely affected by sludge application at specific ORR sites. DOE's ecologists at ORNL routinely and frequently consult with TDEC, the Tennessee Wildlife Resources Agency, and the U.S. Fish and Wildlife Service to ensure that protected species and habitat are not adversely impacted by the sludge land application program and other DOE actions on the ORR.

### Occupational and Public Health and Safety

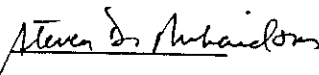
**Radiological:** Workers may be exposed to radionuclides in sludge by incidental ingestion and inhalation of particulates during handling and application. The health risk analysis conducted for this proposed action concludes that the combined chemical and radiological risks to workers would be minimal and within the EPA target range for excess lifetime cancer risk ( $10^{-6}$  to  $10^{-4}$ ). Monitoring of sludge application program workers for more than a decade has shown no detectable exposures to radionuclides. Offsite, the public exposure to radionuclides in the sludge applied on the ORR would continue to be low, although the basis for calculating radiological dose would change. The proposed dose limit of 4 mrem/year was established with the approval of TDEC because it is protective of human health and the environment.

Based on estimates of accidents and casualties from transport of sewage sludge from ORNL and K-25 to the COR POTW, impacts would be insignificant. Total potential accidents and casualties over 10 years of sludge application would be less than 1. Cancer risk from occupational exposure to sludge spilled in an accident would be  $1 \times 10^{-10}$ , which is extremely low when compared to the risk of cancer from natural causes ( $2.5 \times 10^{-3}$ ). Risk to the public from a spill would be negligible.

**Nonradiological:** With improper management, worker and public health could be adversely affected by accumulation of heavy metals and pathogens in the soil, which in turn are accumulated in food and water. Because the historically conservative loading limits of the program have been less than EPA and TDEC limits established to protect human health, chemical contaminants in receiving soils have remained below acceptable levels. Proposed changes to the program would continue to restrict sludge loading to the limits established by EPA and TDEC.

**DETERMINATION:** Based on the findings of DOE/EA-1042, DOE has determined that the proposed changes in the sanitary sewage sludge land application program on the Oak Ridge Reservation, Oak Ridge, Tennessee, do not constitute a major Federal action that would significantly affect the quality of the human environment within the context of the National Environmental Policy Act. Therefore, preparation of an environmental impact statement is not required.

Issued at Oak Ridge, Tennessee, this 14<sup>th</sup> day of Nov 1996.

  
James C. Hall  
Manager  
U.S. Department of Energy  
Oak Ridge Operations Office  
Oak Ridge, Tennessee