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EDITORIAL

Low-Level Radioactive Waste

By engaging in endless litigation and raising groundless fears, activists may succeed in drastically limiting U.S. availability of low-level radioactive substances. If so, the use of life-saving isotopes in medicine would be curtailed. Medical laboratory procedures involving 100 million tests per year would be adversely affected. Efforts to determine the safety of new pharmaceuticals would be hindered. The use of low-level radioactive substances in biotechnology research and development and in many aspects of science and industry would be inhibited.

Use of low-level radioactivity produces low-level radioactive waste (LLRW), which includes clothing, paper, glassware, tools, and other articles that have come in contact with radioactivity. By federal statute, LLRW does not include spent nuclear fuel rods or nuclear weapons waste.

Congress enacted the Low-Level Radioactive Policy Act in December 1980. The act established a schedule of steps that states must take by 1 January 1996 to ensure safe disposal of LLRW. As of June 1995, most states have neither local facilities nor access to facilities elsewhere. California is an example. It has no major facility, though great efforts have been made to select and obtain a suitable site and to design a safe repository. Politics and litigation have thwarted 10 years of effort. As a result, LLRW is piling up at 800 urban locations. With such a large number of sites, the danger of accidents is multiplied.

The California Department of Health Services repeatedly sought input from many technical experts and from the council of the League of Women Voters. The site ultimately chosen is located on federally owned land in Ward Valley in the eastern Mojave desert about 20 miles west of Needles. Permission for California to take title to the land was granted in 1992 but later revoked by Interior Secretary Bruce Babbitt. This was in response to claims that leakage from the buried waste would contaminate the Colorado River. Opponents drew support from an unofficial "Wilshire report" prepared by three geologists connected with the U.S. Geological Survey (USGS). The item was not peer-reviewed. In contrast, USGS later issued an official peer-reviewed document that in effect stated that it is unlikely that leakage from Ward Valley would contaminate the Colorado River. Nevertheless, Babbitt continued to hold up approval of sale of the site while a National Research Council (NRC) committee addressed issues raised by the Wilshire report. The new 240-page NRC report in effect states that, at most, contamination of the Colorado River would be trivial. The document does recommend extensive monitoring of Ward Valley and other potential waste sites.

Annual precipitation in Ward Valley averages about 15 centimeters. Because of highly effective evapotranspiration, the soil beneath the chosen site is relatively dry. The water table is about 200 meters below the surface. When substantial rains occur in the surrounding mountains, an ephemeral stream, Homer Wash, conducts water down the valley toward a dry lake 65 kilometers away. The waste site is located 760 meters away from the wash and at a higher elevation. A controversial question is whether the dry unsaturated sediments are a barrier to movement of substances from the waste repository. Crucial evidence is the presence of large amounts of chloride in the soil at depths of 10 to 30 meters. Chloride accumulates slowly; as many as 50,000 years have elapsed since water flushed chloride down and out. The time estimates have substantial probable error, but the existence of a long-term accumulation of chloride cannot be denied.

An important impediment to migration of LLRW was not mentioned in the Wilshire report. To be accepted for burial, wastes must meet strict federal regulations. They must be dry and in suitable containers such as steel drums or reinforced steel boxes. Wastes containing high levels of tritium must be in plastic containers surrounded by concrete. At the waste site, containers would be placed in dry trenches and covered by a thick layer of dry dirt. The Wilshire report also did not mention well-documented impediments to movement of substances through sediments. Soils have many binding sites (for example, ion-exchange capacities) as well as micropores where molecules can be held.

The risks stemming from one carefully monitored Ward Valley LLRW site are trivial in comparison with those from 800 urban accumulations. Enough of groundless fears and litigation.

Philip H. Abelson