

11. Who Generates Radioactive Waste in New Jersey?

Commercial low-level radioactive waste is generated by six categories of generators: nuclear power plants, pharmaceutical industry, other industries, medical institutions, research facilities/universities, and some government facilities. The types and volumes of low-level waste vary among these six categories of facilities, as do waste management practices. In recent years there has been a significant reduction in the volume of radioactive waste produced.

This Fact Sheet describes the changes in plans for disposal and the impact those changes may have on low-level waste storage at the generation sites, and the type and amount of low-level waste produced by each category of generator.

► Summary of Changes in Low-Level Radioactive Waste Disposal Procedures

Prior to 1993, low-level radioactive waste was shipped to one of three sites for burial: Barnwell, South Carolina; Beatty, Nevada; and Richland, Washington. Generators usually stored low-level waste at their plants or institutions until enough waste accumulated for a shipment to a disposal site. Then the waste was packaged and shipped by truck to one of the disposal facilities.

As of January 1, 1993, federal law permitted all three of the existing disposal sites to close. By that time, states and compacts (groups of states organized to manage disposal of their low-level radioactive waste) were supposed to become responsible for disposing of their own low-level waste. On December 31, 1992, the Nevada and Washington sites closed to low-level waste generators from most states including New Jersey. The Barnwell site in South Carolina agreed to continue taking low-level waste from some states, including New Jersey, until June 30,

1994. After that time, low-level waste generators in 31 states, including New Jersey, had no place to dispose of their waste. They were forced to store waste at the point of generation or to contract very limited storage space from brokers of radioactive waste.

In July 1995, the Barnwell site resumed acceptance of low-level waste from all states except North Carolina, which is to serve as the host state for the Southeast Compact's next low-level waste disposal facility. This acceptance has been at escalating costs and is anticipated to be available for up to 10 years on a year-to-year basis. When and if the Barnwell site closes again, generators of low-level waste in New Jersey will again have no place to dispose of this waste until New Jersey can open a disposal facility or find another disposal option. Each low-level generator will again be responsible for storage and monitoring its low-level waste, most probably at the facility where the waste is generated.

► Types of Low-Level Radioactive Waste Produced by Each Category of Generator

The four **nuclear power plants** in New Jersey generate both solid and wet low-level radioactive waste. Some of the more common solid low-level wastes produced at nuclear power plants are protective clothing, shoe covers, paper, construction material, filter materials, and discarded reactor components and equipment. A significant portion of the wet waste is a result of filtering reactor cooling water. New Jersey's low-level waste disposal facility will accept waste only in solid form.

The **pharmaceutical industry** relies on radioactive materials for the development of at least 80 percent of new medicines. The biological behavior of proposed medicines can be determined by making the drug in a radioactive form. Glassware, absorbent paper,

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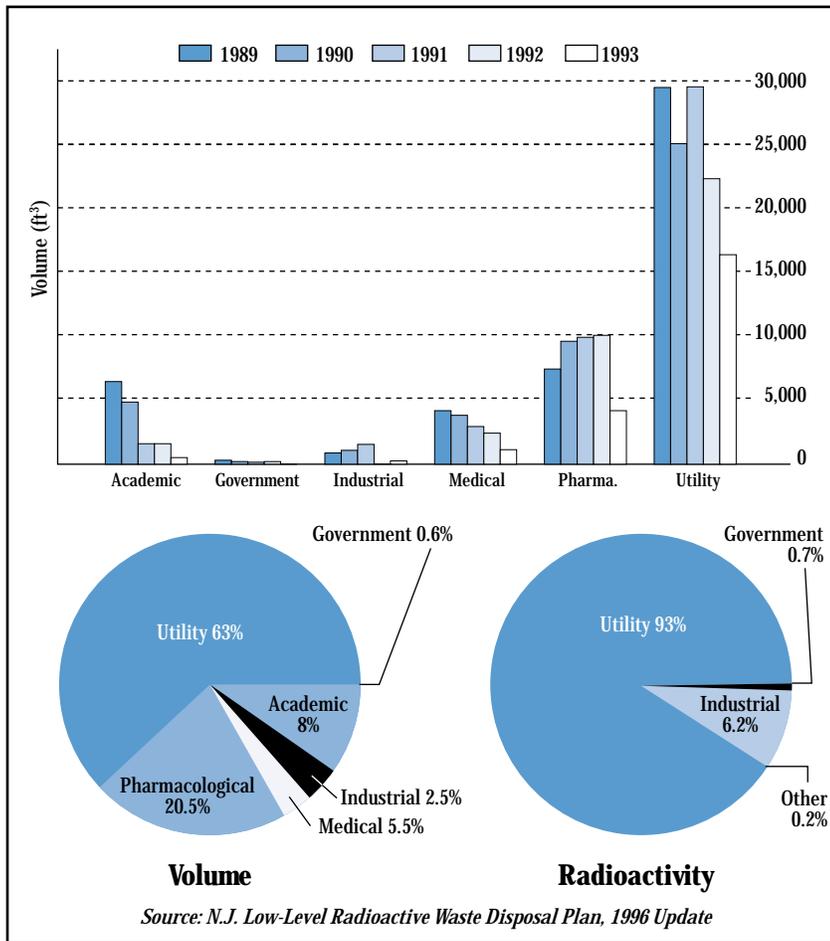


Figure 1. Amount by Volume and Radioactivity of Low-Level Radioactive Waste Generated in New Jersey from 1989 through 1993

syringes, and animal carcasses are examples of material that need to be disposed of as radioactive waste from this research.

Other industries also use radioactive materials in some processes and products. While conducting these processes or manufacturing the products, industry generates low-level radioactive waste. Some of the processes and products which employ radioactive material are sterilization of food, medical supplies, and cosmetics. Consumer products which have small amounts of radioactive material as components include smoke detectors and some older watches with luminescent dials. Both solid and liquid low-level wastes are generated by industry.

Medical facilities operate nuclear medicine departments which use radioactive material for diagnosing and treating disease. Most of the low-level radioactive waste generated in these departments is in the form

of contaminated syringes, glassware, gloves, absorbent pads, and vials containing radioactive drugs. Waste containing materials with very short half-lives can be stored until the radioactivity decays to background levels.

Some **research facilities** use radioactive materials to aid their efforts in developing new products and understanding various chemical, biological, and physical processes. Pharmaceutical development and agricultural studies are examples of uses of radioactive materials. Many universities and colleges also use radioactive materials to aid classroom and laboratory instruction and research in a wide variety of scientific fields. In these universities and other research facilities, low-level radioactive waste is generated in the form of lab coats, gloves, glassware, plastic, paper towels, and other contaminated materials.

Government also generates low-level radioactive waste. Most of this waste is produced in veterans' hospitals, by the armed forces, and at numerous federal research and testing facilities. Its form is similar to that of low-level waste from private medical and research institutions. The State of New Jersey generates small amounts of low-level waste through programs of the Department of Health and Senior Services and the Department of Environmental Protection. Low-level waste generated by the government's atomic weapons production program is the responsibility of the federal government and is stored and disposed of separately.

► Amounts of Low-Level Radioactive Waste Generated

The amount of low-level radioactive waste generated can be presented in two ways. One is to give the volume of the waste in cubic feet or cubic meters. The other is to give the activity. Activity is a measure of the rate at which radiation is given off by the radioactive materials in the waste. Activity is measured in curies. The volume and activity of waste shipped to disposal sites by New Jersey generators is reported annually to the Low-

Level Radioactive Waste Disposal Facility Siting Board.

The percentage of low-level radioactive waste disposed of by each of the six generator categories in New Jersey from 1989 through 1993 is illustrated in Figure 1. Quantities are illustrated in terms of volume and radioactive content. During this period nuclear power plants generated approximately 63 percent of the volume and 93 percent of the radioactivity. It should be noted that the total volume and the percentage generated by each category changes from year to year and historical data may not represent future waste generation rates.

► **For More Information**

If you want to read more about how radioactive waste is generated, some of the references listed below may be helpful.

- Edward L. Gershey, *Low-Level Radioactive Waste: From Cradle to Grave*, Van Nostrand Reinhold, New York, 1990.
- Raymond L. Murray, *Understanding Radioactive Waste*, Battelle Press, Columbus, Ohio, Fourth Edition, 1994.

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