

Understanding Hazardous & Radioactive Wastes in Utah

April 15, 2004

Utahns are concerned with the transportation and storage of hazardous waste within the state. Pertinent issues include Utah's historical experience dealing with hazardous waste, its current practices for managing the waste, and the policy debates that will determine Utah's future hazardous waste policies.

What is hazardous waste?

Hazardous waste is defined in Utah as a solid waste that (a) causes, or significantly contributes to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) poses a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed. (Utah Administrative Code R-315-2-9) Hazardous waste includes both radioactive and non-radioactive waste.

In Utah, hazardous waste began to be present in significant amounts when miners started removing precious metals from Utah's mountains. While these metals are not particularly hazardous themselves, the extraction process creates byproducts that are hazardous, including arsenic, cyanide, lead and mercury. With the growth of the uranium industry in the first half of the 20th century, radioactive materials were also introduced into Utah's economy. Radioactive waste is divided into two types, low-level & high-level. Low level also has three distinct categories: A, B & C. The actual levels of radioactivity, measured in curies, vary across materials within each group.

The level of radioactivity is not the only factor considered when assigning a material to a group. Each material is evaluated and assigned a "hazard-life," based on its unique interaction with human biology. For instance, some isotopes tend to remain in the bloodstream for a longer time than others, or to concentrate in certain organs, emitting radiation, while others are less harmful.

Low-Level Waste

Low-level radioactive waste includes items that have become contaminated through exposure to neutron radiation. They come from sources within different industries, such as electricity production, national defense, manufacturing, medicine and research. Examples are contaminated protective shoe covers & clothing, cleaning materials, tools and equipment, syringes and other supplies. The most radioactive low-level wastes are typically found in the water treatment residues and discarded parts from nuclear reactors. (Source: Nuclear Regulatory Commission, NRC: [Low-Level Waste](#))

High-Level Waste

High-level radioactive wastes are produced by two main industries: commercial electricity production and the Department of Defense. The waste materials produced by these industries include spent (used) fuel rods and the buildings, materials and tools used to process the fuel rods. (Source: NRC: [High-Level Waste](#))

Since the conclusion of the Cold War, the Defense Department has significantly reduced the amount of high-level waste it produces. Commercial electricity production still relies heavily on nuclear power, especially in the eastern United States.

Where are Hazardous Wastes in Utah?

Until relatively recently, the danger of exposure to hazardous materials was not well known. Tailings from most mines were simply left in piles near the entrance, where they often migrated into nearby groundwater. The sand-like tailings from the uranium mines in Southeast Utah were added to local asphalt and concrete projects. Tailings from mines in the Salt Lake area were used as backfill for construction projects, and as sand for landscaping and other projects. Other hazardous wastes were disposed of as regular garbage in municipal dumps or were simply stored on the site where they were used or produced.

The Division of Solid and Hazardous Waste requires that hazardous waste be properly disposed. Different processes allow for the safe storage and disposal of hazardous waste, depending on the type. Hazardous

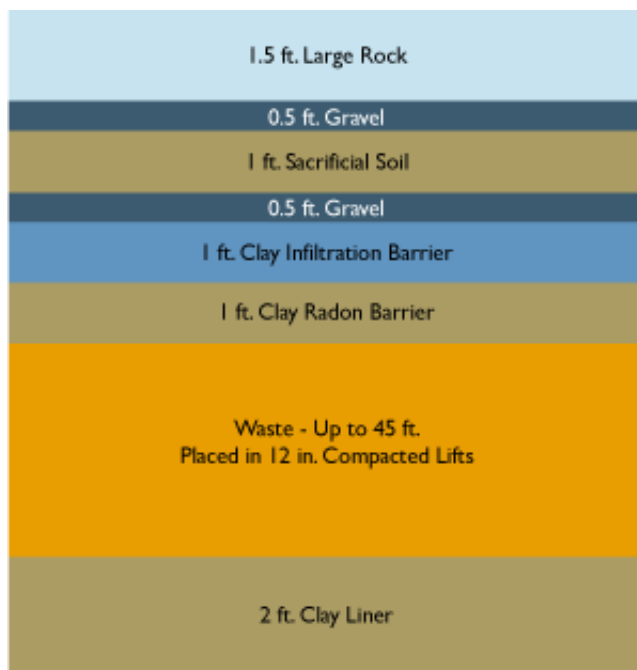
wastes that are radioactive require additional care. Only low-level radioactive wastes are produced or accepted in Utah. Those that are produced in medicine and research have hazard-lives short enough to allow them to be stored in containers that shield the radiation until they have decayed to levels safe enough for disposal with regular garbage.

Other low-level radioactive waste, such as that produced by industry and defense, must be transported to a licensed disposal facility. When Utah became a member of the Northwest Compact, it agreed to dispose of all its low-level radioactive waste at the Richland, Washington facility. The Northwest Compact, overseen by the Nuclear Regulatory Commission (NRC), is a voluntary agreement among eight northwestern states to adopt the same policies regarding radioactive waste. Envirocare, located in Tooele County, accepts low-level radioactive waste produced in some states outside the compact.

Disposal Transportation

Envirocare is currently licensed by the state to accept only Class A low-level radioactive waste. This includes irradiated soil and construction debris from government and commercial locations, tools and equipment from nuclear power plants, protective clothing and lab supplies from medical and research facilities and filters used to clean water at nuclear power plants. It disposes of these materials underground, isolating them from the air and surface water above, and from groundwater below, using layers of rock and low-permeability clay. Envirocare asserts that the buried waste will remain isolated well beyond the 100-year hazard-life of the waste.

Figure 1: Cross-Section of an Envirocare Disposal Cell



Source: Envirocare

The Department of Environmental Quality is currently reviewing an application that would allow Envirocare to receive Class B & C radioactive waste.

Transporting radioactive waste to the disposal facility is done by railcar and tractor-trailer. To address concerns about the safety of transporting these materials, Envirocare cites that exposure to radiation has not caused an accident or injury in 40 years of domestic and international radioactive material transportation. The reason they give for this is the security of the containers used to transport the material. Three types are used to transport low-level waste, depending on the level of radiation. Very low-level radioactive material is transported in metal boxes, secured with steel bands. Slightly higher-level material is shipped in steel boxes or drums, tested to withstand normal transportation conditions. The highest low-level radioactive materials are transported in metal casks that are engineered to withstand:

- a 30-foot fall onto an unyielding surface;
- a 40-inch drop onto a 6-inch steel spike;
- a 30-minute exposure to fire of 1,475 degrees Fahrenheit; and
- an 8-hour submersion under 50 feet of water.

Public Policy Issues

The major policy debate nationwide has been about the transportation and storage of high-level radioactive waste. The federal government has been evaluating Yucca Mountain, Nevada as a location for permanently disposing of spent nuclear fuel rods. Many Utahns are concerned that much of the waste will travel through Utah on its way to Nevada, if the Yucca Mountain site is approved.

Private Fuel Storage, LLC, (PFS) is an alliance of eight national utility companies. It is seeking a license from the NRC to allow it to lease land from the Skull Valley Band of the Goshute Tribe in order to store high-level radioactive waste. The NRC, which would maintain oversight, is currently reviewing the application. If the license were granted, the Bureau of Indian Affairs would be charged with approving the lease, pending environmental approval. The Bureau of Land Management would then need to concede a right-of-way on the property adjacent to the Goshute land, where the waste would be transferred from railcar to truck. Additionally, the Goshute tribal general council would need to accept the proposal.

Both former Governor Mike Leavitt and Governor Olene Walker have voiced strong opposition to the PFS plan. The Utah Department of Environmental Quality houses an office that advocates against it. It offers 4 chief arguments against PFS:

- “Temporary” storage cannot be guaranteed to be temporary. The proposed facility will be designed and constructed as a temporary location. However, there is no way to ensure the spent fuel rods will ever be removed from the site.
- Need for a temporary storage site has not been documented. The General Accounting Office, with Department of Energy concurrence, has determined sufficient temporary storage capacity already exists at power plants that generate the waste.
- Utah does not generate these wastes. There is no interest in increasing the risk and impact to people in this area by importing high-level nuclear waste.
- Health and safety issues regarding transportation of high-level nuclear waste have not been addressed.

Despite Utah’s opposition, the land in question is independent of Utah jurisdiction; therefore, the state is limited in its ability to stop any agreement that may arise between PFS and the Skull Valley Band.

Superfund - Cases of Improper Handling

Like most states, Utah did little in its early history to regulate the release of hazardous wastes into the environment. In 1980, as a result of increasing awareness of the dangers these materials presented when improperly handled, the U.S. Congress established the Comprehensive Environmental Response, Compensation, & Liability (Superfund) Act. It provided for the cleanup of the nation’s worst hazardous waste sites. The Environmental Protection Agency (EPA) maintains a National Priority Listing (NPL) in conjunction with the Superfund Act. The NPL is a list of the most urgent Superfund sites. Utah has 22 sites on the list, of which 8 have completed remediation. The remaining 14 are in various stages of remediation. Maps showing all 22 Utah sites are included below. For details on these sites, see EPA’s website. [Utah sites, Superfund, EPA.](#)

Figure 2: Utah Superfund Sites



- Completed Sites
- 1 Defense Depot Ogden Utah
- 2 Monticello Vicinity Properties
- 3 Petrochem / Ekotek
- 4 Portland Cement
- 5 Rose Park Sludge Pit
- 6 Sharon Steel
- 7 Utah Power and Light
- 8 Wasatch Chemical
- 9 Richardson Flats Tailings

- Active Sites
- 1 Bountiful / Woods Cross
- 2 Eureka Mills
- 3 Flagstaff / Davenport
- 4 Hill Air Force Base
- 5 Jacobs Smelter
- 6 Intermountain Waste Oil
- 7 International Smelter
- 8 Monticello Mill Tailing
- 9 Richardson Flats Tailings
- 10 Tooele Depot (North)
- 11 Kennecott North
- 12 Kennecott South
- 13 Midvale Slag
- 14 Murray Smelter



Source: Environmental Protection Agency

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