

ASSURING SAFE DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE: STATUS, PROBLEMS, AND PROPOSED SOLUTIONS

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by

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The National Picture:

Disposal capacity for low-level radioactive waste is limited and dwindling. On the nation's present course, by July 2008, public and private organizations and most government agencies that use radioactive materials in thirty-four to thirty-six states, the District of Columbia, and Puerto Rico will have no place to dispose of their more radioactive categories of low-level radioactive waste. Also at that time, one facility will have monopoly control over disposal of the most voluminous (and least radioactive) category of low-level waste from these states.

Cal Rad Forum believes it appropriate for Congress to revisit the Low-Level Radioactive Waste Policy Act and fashion a solution that assures all users of radioactive materials in the U.S. access to safe disposal facilities.

Today, only three facilities in the U.S. accept so-called "commercial" low-level radioactive waste (LLRW) for permanent disposal. Two of these facilities are fully licensed; one is not. Organizations that rely completely on these disposal facilities include universities, utilities with nuclear power plants, industries including biotech and pharmaceutical companies, medical centers, and state and federal agencies not including the U.S. Department of Energy or its laboratories. (DOE uses one of these facilities — Envirocare of Utah — and also operates its own disposal facilities.) These disposal facilities are in the states of Washington, South Carolina, and Utah. Disposal capacity is limited despite Congress' intent in enacting the Low-Level Radioactive Waste Policy Act in 1980 (Public Law 96-573) and the Amendments Act of 1985 (Public Law 99-240). The Policy Act was designed to stimulate development of new facilities by encouraging states to form interstate compacts for disposal on a regional basis. In this way, it was hoped that a few states would not bear the "burden" of performing this service for the entire country. Indeed, the Policy Act was in response to threats from the States of Washington, Nevada, and South Carolina in 1979 to close their disposal facilities. However, in the twenty-four years since enactment of the Policy Act, no new facilities, consistent with the requirements of the Act, i.e., fully-licensed to dispose of waste classes A, B, and C, have been developed. The Utah facility is licensed to receive only a subset of Class A waste, the least radioactive category of LLRW, and was created and operates outside of the compact system.

What is low-level radioactive waste?

The statutory definition of low-level radioactive waste is set forth in Section 2 (Definitions), Title I—Low-Level Radioactive Waste Policy Amendments Act of 1985, Public Law 99-240—Jan. 15, 1986 (Act):

“(9) Low-level radioactive waste.—The term ‘low-level radioactive waste’ means radioactive material that—

“(A) is not high-level radioactive waste, spent nuclear fuel, or byproduct material (as defined in section 11e.(2) of the Atomic Energy Act of 1954 (42 U.S.C. 2014(e)(2))); and

“(B) the Nuclear Regulatory Commission, consistent with existing law and in accordance with paragraph (A), classifies as low-level radioactive waste.”

LLRW is waste generated by the use of radioactive materials in industrial, academic, research, medical, and governmental activities, nuclear power generation, and facility and site decontamination. LLRW consists of radioactively contaminated clothing, tools, laboratory equipment, machinery, filters from nuclear power plants, rubble and dirt, etc.

What is disposal?

“(7) Disposal.—The term ‘disposal’ means the permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws, or by an agreement State if such isolation occurs in such agreement State.” — P.L. 99-240, Section 2 (Definitions).

What are state and federal responsibilities for disposal of low-level radioactive waste?

State and federal responsibilities for disposal of LLRW are set forth in Section 3 of the Act:

“Section 3(a)(1) State Responsibilities. [Quoted in part]—Each State shall be responsible for providing, either by itself or in cooperation with other States, for the disposal of—

“(A) low-level radioactive waste generated within the State (other than by the Federal Government) that consists of or contains class A, B, or C radioactive waste as defined by section 61.55 of title 10, Code of Federal Regulations, as in effect on January 26, 1983;

“(B) low-level radioactive waste described in subparagraph (A) that is generated by the Federal Government except such waste that is—

“(i) owned or generated by the Department of Energy;

“(ii) owned or generated by the United States Navy as a result of the decommissioning of vessels of the United States Navy; or

“(iii) owned or generated as a result of any research, development, testing, or production of any atomic weapon; and

“(C) low-level radioactive waste described in subparagraphs (A) and (B) that is generated outside of the State and accepted for disposal in accordance with sections 5 or 6.”

Section 3 goes on to describe federal disposal responsibilities in Section 3(b)(1). These include greater than Class C low-level waste, low-level waste owned or generated by the Department of Energy, waste owned or generated by the United States Navy as the result of decommissioning of vessels of the United States Navy, and low-level waste owned or generated by the Federal Government as a result of any research, development, testing, or production of any atomic weapon.

It should be noted that in addition to its statutory responsibilities the federal government, through the Department of Energy’s Off-Site Source Recovery Program at the Los Alamos National Laboratory, has taken on the responsibility to collect and safeguard sealed radioactive sources that would otherwise be orphaned.

Today’s situation for disposal of low-level radioactive waste: Barnwell, South Carolina; Richland, Washington; and Envirocare of Utah (Clive, Utah)

- 1) The low-level radioactive waste disposal facility at Barnwell, South Carolina¹ is the regional disposal facility for the Atlantic Compact. On July 1, 2008, use of the South Carolina disposal facility will be restricted to the three member states of that Compact: South Carolina, New Jersey, and Connecticut. South Carolina law also establishes annually decreasing limits on waste volumes that can be accepted for disposal prior to July 1, 2008. (Please see chart on page 7.) The South Carolina Senate recently rejected a proposal to raise the volume cap for fiscal year 2004-2005 by 100,000 cubic feet of Class A waste in exchange for a payment of \$6 million by the facility operator.

Today, in addition to the three states of the Atlantic Compact, users of radioactive materials in thirty-six states which are not members of the Northwest, Rocky Mountain, or Atlantic Compacts rely on Barnwell as the only facility where they can dispose of their Class B and Class C (more radioactive) wastes. The low-level wastes sent to Barnwell from these thirty-six states account for 93% of the radioactivity (measured in curies) disposed of by users of radioactive materials in all states at all three disposal facilities.²

- 2) The Richland, Washington facility³ is the regional disposal facility for the Northwest Compact. In 1993, under provisions of the Act, use of this facility was restricted to the eight member states of the Northwest Compact, and, subsequently, by contract, the three states of the Rocky Mountain Compact were granted access.

¹ Operated by the Chem Nuclear subsidiary of GTS Duratek and regulated by the State of South Carolina which is an Agreement State.

² Manifest Information Management System <<http://mims.apps.em.doe.gov>>. Figures are for FY 2003, 7/1/02 to 6/30/03.

³ Operated by US Ecology, Inc. and regulated by the State of Washington which is an Agreement State under the Atomic Energy Act.

- 3) The disposal facility at Clive, Utah⁴ accepts only a subset of Class A waste, the least radioactive category, from all states except those in the Northwest and Rocky Mountain Compacts. This facility is not licensed to dispose of sealed sources or biological tissue waste. A proposal to expand the license to include waste Classes B and C was put on hold in 2001 when it failed to gain the approval of the Governor and Legislature as required by Utah law. A legislative Task Force is considering the Class B and C disposal issue. On May 18, 2004, the Task Force made a preliminary recommendation against Utah's acceptance of Class B and C waste. A final recommendation is expected in November 2004.

With the exception of Texas, all state programs for development of new disposal facilities in the U.S. have stopped

In 24 years, the states have not demonstrated the political will necessary to implement the Policy Act and develop new disposal facilities. Since enactment of the federal Policy Act, only one state has issued a full license (waste Classes A, B, and C) for a new disposal facility. In 1993, The California Department of Health Services (California's Agreement State Agency) issued a license for a disposal facility at a remote location on federal land in the Mojave Desert called Ward Valley. The facility has never been built. Ward Valley was intended as the regional disposal facility for the Southwestern Compact (Host State California, Arizona, North Dakota, and South Dakota). On September 12, 2002, California Governor Gray Davis signed into law a prohibition on the development of the Ward Valley regional LLRW disposal facility.

Summary of the national low-level radioactive waste disposal problem

Beginning July 1, 2008, when use of the South Carolina facility is restricted to the Atlantic Compact, organizations that use radioactive materials in the District of Columbia, Puerto Rico, and at least thirty-four, and possibly thirty-six states, which are not members of the Northwest, Rocky Mountain, or Atlantic Compacts will have no place to dispose of their Class B and C low-level waste. These are the more radioactive categories of low-level waste whose disposal is a state responsibility. At that time, only the Utah facility will accept a subset of their Class A low-level waste — not including biological tissue wastes or sealed sources. While about 97% of the low-level waste volume from these thirty-six states goes to Utah, the remaining 3%, by volume, currently disposed of at Barnwell, contains over 99% of the radioactivity from these states.

Even prior to July 1, 2008, space at the Barnwell disposal facility will be very limited, especially in fiscal years 2007 and 2008 as shown in the chart on page 7. (See "Remainder" entries after allowing for the "Committed" volumes and the Atlantic Compact "Set asides.") This is due to the declining statutory volume caps.

Litigation against compact Host States

Failure by Compact Host States to fulfill their obligations to develop regional disposal facilities has resulted in two lawsuits by Compact Commissions and one by a facility development company.

⁴ Operated by Envirocare of Utah and regulated by the State of Utah, which is an Agreement State.

The Central Interstate Compact Commission sued Host State Nebraska alleging bad faith and political manipulation of the State's regulatory decision to reject a license application to develop a disposal facility in Boyd County. The Commission asked for recovery of monetary damages and appointment of a special master to complete the review of the license application. The U.S. Supreme Court rejected Nebraska's attempt to seek refuge in the doctrine of sovereign immunity. At trial, the federal District Court in Nebraska found against the State and awarded the Commission \$151 million. However, the judge declined to involve the court in an attempt to complete the proposed disposal project as requested by the Compact Commission. Nebraska appealed the damages award, however the Circuit Court of Appeals upheld the trial court's judgment including a finding of "bad faith." The State of Nebraska and the Central Interstate Compact Commission recently settled the suit for \$141 million. Evidently, Nebraska would rather forfeit \$141 million than build a disposal facility.

In May 2002, the States of Alabama, Florida, Tennessee, and Virginia joined the Southeast Compact Commission in a lawsuit against Host State North Carolina for its failure to develop a disposal facility. The Supreme Court has taken original jurisdiction of this lawsuit.

In May 2000, the State of California's licensee for development and operation of a low-level waste disposal facility sued the State seeking recovery of monetary damages. Trial was earlier this year, and the trial court denied the claim. The court declined to reconsider its decision, and the licensee filed a notice of appeal to the State Appellate Court.

None of the lawsuits described above is likely to lead to development of a new disposal facility.

Recommended action to avoid the coming crisis in low-level waste disposal: Amend the Policy Act to provide a role for the federal government in assuring availability of safe disposal capacity for low-level radioactive waste

In 24 years, the Low-Level Radioactive Waste Policy Act has yielded 10 interstate compact commissions, three lawsuits, and no new disposal facilities. Based on the states' track record, Congress and the Administration might reasonably conclude that the states have failed to provide the necessary disposal infrastructure and are unlikely to do so.⁵ Hopefully, a conclusion that the states won't do the job and that the nation does not need ten low-level waste disposal facilities would lead to a decision to amend (not repeal) the Act and that the federal government should assume responsibility for disposal of "commercial" low-level radioactive waste — at least for those thirty-six states not in compacts with existing regional disposal facilities, the District of Columbia, and Puerto Rico. Near-term use of the Department of Energy's own disposal facilities for this purpose might find support in the conclusions of a DOE Inspector General's report that

⁵ See, for example, the Audit Report, "National Low-Level Waste Management Program," DOE/IG-0462 by the U.S. Department of Energy, Office of Inspector General's Office of Audit Services, February 2000.

the Department's disposal facilities are under-utilized.⁶ The report found that DOE's Nevada and Hanford facilities are being used at less than 50 percent capacity.

A long-term national solution might include Congressional authorization for the development and operation of one or two LLRW disposal facilities, possibly by the Department of Energy or commercial entities, on federal land, under direct regulation by the U.S. Nuclear Regulatory Commission.

Although ten interstate compacts have received congressional consent, the nation does not need ten disposal facilities for LLRW. (In addition, seven states are not members of interstate compacts.) There never was an economic justification for the Policy Act. Regional equity was both the rationalization for the Act and an incentive to develop new disposal facilities. But this incentive (carrot) has not been sufficient to inspire the political will necessary to do the job. When the U.S. Supreme Court struck-down the "Take Title" provision, the Act lost its "stick." Furthermore, volumes of commercial (non-DOE) LLRW have declined since 1980. Economics justifies a few disposal facilities each with large capacity rather than many facilities each with small capacity.

The States of South Carolina and Washington have provided disposal capacity consistent with the requirements of the Policy Act and their compact obligations. Any amendment to the Act should allow these States and their compacts to continue to do so. As well, Texas or any other state that pursues development and operation of a disposal facility pursuant to the Act should also be able to do so.

Safety of LLRW disposal: Comprehensive regulations of the U.S. Nuclear Regulatory Commission

Disposal of LLRW has been carried out safely and justifies current and future use of near surface disposal pursuant to the NRC's regulations at title 10 part 61 of the Code of Federal Regulations. The still-operating disposal facilities at Barnwell, SC and Richland, WA have operated safely for many years. Such problems as have occurred at old facilities, e.g., migration of tritium due to disposal of liquid wastes at the Beatty, NV disposal facility which was closed in 1993, are addressed by the current regulations. These regulations, adopted in 1982, are comprehensive. Among the issues addressed are disposal site selection criteria, facility design, waste classification, waste form and packaging (e.g., requirements for solidification of liquids), financial assurances, and long-term post-closure institutional controls.

The recent report by the U.S. General Accounting Office contains errors and understates the urgency of the problem

A report by the U.S. General Accounting Office ("Low-Level Radioactive Waste: Disposal Availability Adequate in the Short Term, but Oversight Needed to Identify Any Future Shortfalls," GAO-04-604, June 2004) understates the urgency of the LLRW disposal situation in both the short term (prior to July 1, 2008) and the long term. The report also contains significant errors. For example, the report fails to recognize that the Envirocare facility in Utah is not licensed to dispose of biological tissue waste. The

⁶ "Utilization of the Department's Low-Level Waste Disposal Facilities," DOE/IG-05-5, May 25, 2001.

report also misstates federal law by saying that States are not responsible for disposal of waste produced by the nuclear propulsion component of the Department of the Navy. Disposal of wastes owned or generated by the Department of Energy and from the decommissioning of naval vessels is a federal responsibility.⁷ But wastes from the Navy's operating fleet are disposed of at commercial facilities (e.g., Barnwell, SC). After July 1, 2008, the Navy and other federal agencies, state governments along with commercial organizations and public institutions that generate radioactive waste outside of South Carolina, New Jersey and Connecticut will not be able to dispose of their radioactive waste at Barnwell, SC.

The GAO report speculates that various solutions to the LLRW disposal problem may develop without action by the Congress. For example, the report speculates that the Envirocare of Utah facility might be licensed to dispose of Class B and C wastes. But, last May, a task force of the Utah Legislature issued a preliminary recommendation against B and C disposal. (A final task force report is due in November.)

Underlying the GAO report's conclusions is the mistaken belief that storage of wastes is an adequate alternative to disposal. While temporary storage of low-level waste can be and is being safely performed, only disposal is a permanent solution. Furthermore, in the case of decommissioning of facilities where radioactive materials have been used, on-site storage is obviously not even a temporary option as the wastes must be removed from the site and safely disposed of. Facility decommissioning is a frequent occurrence, particularly in the industrial sector. NRC policy is that radioactive wastes should be disposed of and not stored indefinitely.

The need for Congress to revisit the Low-Level Radioactive Waste Policy Act is urgent.

Time is of the essence. July 1, 2008 and the end of disposal in South Carolina for LLRW from thirty-six states, the District of Columbia, and Puerto Rico are not far off. It took California thirteen years from enactment of enabling legislation in 1983 to issue the Ward Valley license (1993) and successfully defend the license and the Environmental Impact Report in State Courts (1996).

Assurance that future disposal capacity will be available is vital. Lack of such assurance has already curtailed some uses of radioactive materials in research. In Cal Rad's view, the comments of the U.S. Nuclear Regulatory Commission on the GAO report (Appendix V of the Report) are on point and are probably the most valuable part of the report:

“The current report is a sequel to GAO's 1999 report, “Low-Level Radioactive Wastes: States Are Not Developing Disposal Facilities” (GAO/RCED-99-238). That report concluded that none of the States' or compacts' efforts to develop new disposal capacity had been successful and the state efforts to do so had “essentially stopped.” This earlier report also examined alternatives to the current system for development of new disposal capacity in the U.S., but did not recommend any of them.

⁷ See P.L. 99-240, Sections 3(a)(1) and 3(b)(1) as discussed on page 2 of this testimony.

Appendix II of the current report updates these alternatives. We believe that it is now time for GAO to explore these alternatives further because the future availability of disposal capacity and the costs of disposal under the current system remain highly uncertain and LLRW generators need predictability and stability in the national disposal system. We acknowledge that the potential approval for Envirocare to accept Class B and C wastes and licensing of a LLRW disposal facility in Texas could significantly improve the current LLRW disposal system in the U.S. At the same time, the nearly 20 years of experience under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) has demonstrated the difficulties in siting and licensing a LLRW facility. Not one new facility has been developed in this time under the LLRWPA. Therefore, we believe it is in the national interest to begin exploring the alternatives identified in Appendix II that would potentially provide a better legal and policy framework for new disposal facilities for commercial generators of LLRW.”

The nation’s low-level waste disposal infrastructure is inadequate and, without action by Congress, will become much worse. Beneficial uses of radioactive materials by industries, research and medical institutions, utilities and agencies of state and federal governments are jeopardized by the current and projected future inadequate disposal infrastructure. Lack of disposal capacity could stop or impede some research, medical, and industrial uses of radioactive materials and have a detrimental impact on the quality of life and health.

**Barnwell Volume Profile
September 2004**

Cubic Feet

	FY2005	FY2006	FY2007	FY2008
Site cap	50,000	45,000	40,000	35,000
Committed	23,600	23,600	22,400	22,300
Set asides	8,000 – 11,000	8,000 – 11,000	8,000 – 11,000	5,000 – 9,000
Remainder	15,400 – 18,400	10,400 – 13,400	6,600 – 9,600	3,700 – 7,700

Source: State of South Carolina Budget and Control Board.