LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT IN NEW YORK STATE:

MEETING THE MILESTONES

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ABSTRACT

The federal Low-Level Radioactive Waste Policy Act of 1980 made the states responsible for disposal of low-level radioactive waste (LLRW) generated within their borders. Following enactment of this Act, New York entered into discussions with other states in the Northeast. These discussions led to a proposed interstate compact. Following a study of the proposed compact as well as other options, New York State decided not to join the compact, but to go it alone.

After extensive hearings and public participation, the State enacted a Radioactive Waste Management Act (State LLRWMA) in July 1986.

This Act provides for a comprehensive program to meet the State's low-level radioactive waste responsibilities, leading to an operating facility for disposing of waste generated within the State. This facility is to be operational by January 1, 1993.

The State LLRWMA: (1) assigns the task of disposal site and technology selection to a five-member ad-hoc Siting Commission to be appointed by the Governor; (2) charges the New York State Energy Research and Development Authority with obtaining the required licenses and permits and constructing and operating the facility; and (3) gives the New York State Department of Environmental Conservation the principal regulator role, including responsibility for establishing siting and disposal criteria.

The comprehensive program established by the State LLRWMA provides for the State to meet the milestones established by the federal Low-Level Radioactive Policy Act of 1980 as amended in December 1985 (Public Law 99-240).

This paper describes New York's program and reviews the State's progress in complying with the milestone established by Public Law 99-240. A number of concerns about LLRW disposal and the schedule calling for a facility to be operational by January 1, 1993, are also discussed.

INTRODUCTION

The State of New York has undertaken a comprehensive program to meet its responsibilities under the Low-Level Radioactive Waste Policy Act (Federal LLRWPA) as amended in 1985 (Public Law 99-240). This program is mandated by the New York State Low-Level Radioactive Waste Management Act (State LLRWMA) (Chapter 673, Laws of 1986). The State LLRWMA provides for the State to meet all the milestones established by the 1985 Amendments to the Federal LLRWMA and for a New York State disposal facility to be in operation by January 1, 1993.

The purpose of this paper is to describe New York's program and to give a report on New York's progress in meeting its LLRW responsibilities, specifically its progress in complying with the milestones established by the Federal LLRWPA. A number of concerns about LLRW disposal and the schedule calling for an operating facility by January 1, 1993, are also discussed.

BACKGROUND

Following enactment of the Federal LLRWPA in 1980, New York State participated in regional discussions with other states in the Northeast. These discussions, conducted under the aegis of the Coalition of Northeastern Governors (CONEG), led to a proposed regional interstate LLRW compact. This compact was then submitted to the governors and legislatures of eligible states in the Spring of 1983.

To inform their decision of whether to accept the proposed compact, Governor Cuomo and the New York State Legislature commissioned a study of the compact and other options. This study was conducted by the New York State Energy Office with the assistance of a 17-member advisory committee. Members of this committee included representatives of State and local governments, the medical and academic communities, LLRW generators and environmental organizations.

Public hearings were held throughout the State on a draft report. The final report, including the State Energy Office's recommendations, was issued in April 1984. Based on these recommendations, a Governor's program bill was proposed to the following session of the Legislature. After a 16-month period of Legislative hearings and the enactment of Public Law 99-240, a revised Governor's program bill was passed by the Legislature on July 3, 1986. The Governor signed the Bill into law on July 26.

NEW YORK STATE LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT ACT

The State LLRWMA provides for a LLRW disposal facility to be established and operating by January 1, 1993 to accept LLRW generated within the State. Major responsibilities for establishing and operating

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this facility are assigned to: a Siting Commission, an Advisory Committee, the State Department of Environmental Conservation (DEC) and the New York State Energy Research and Development Authority (Energy Authority). The Commission is to select the site and disposal technology. The Committee is to advise the Commission and DEC. DEC is responsible for developing the siting and disposal technology selection criteria and certifying the site and disposal technology selected by the Commission. And the Energy Authority is responsible for acquiring the site and designing, constructing and operating the facility.

Provisions for site and technology selection, facility construction and operation, financing, public participation, aid to localities, LLRW data collection and regulation are described in the following sections.

Site and Technology Selection

Criteria. DEC is required to publish draft site and technology selection criteria by July 1, 1987. DEC is required to hold public hearings on the proposed criteria, with final criteria to be published by December 31, 1987. Specific criteria must be included for two disposal options: aboveground, engineered, monitored disposal and underground mined repository disposal Although other disposal options may be considered, shallow land burial is specifically precluded.

Siting. The Siting Commission consists of five members appointed by the Governor: a geologist, a medical doctor, a health physicist, a professional engineer and a private citizen. The private citizen member also chairs the Commission. The Commission is advised by a 13-member Advisory Committee. Members of this Committee include: State officials, environmentalists, LLRW generators, radiation health specialists, and a private citizen. The Committee will subsequently be expanded to include three private citizens from each county within which a site is proposed.

Using the criteria established by DEC, the Siting Commission must select at least one site. It may select an additional site if it finds that two sites offer significant advantages. Likewise, it may choose to select different disposal methods for different categories of waste.

The selected site(s) must be capable of meeting New York's LLRW disposal needs for at least 30 years. In considering potential sites and technologies, the Siting Commission is directed to look at a broad spectrum of public health and safety, environmental and economic factors including:

- ground and surface water contamination;
- fire or explosion hazard;
- impact on scenic, historical, cultural and recreational values, water and air quality and wildlife;
- ability for retrieval or recovery of waste;
- population densities;
- adequacy of transportation routes;
- impacts on local governments; and
- comparative economic implications.

The State LLRWMA excludes the Western New York Nuclear Service Center from consideration as a site.

Certification. The Commission is to submit its site and disposal technology selections to DEC no later than December 1, 1988. Simultaneously it must submit a draft Environmental Impact Statement (EIS). DEC is required to act on the Siting Commission's selections within 180 days (i.e., by June 1, 1989). DEC may either: (1) certify that the Siting Commission's selections meet the criteria, (2) that the selections will meet the criteria with certain modifications, or (3) refuse to certify. If it refuses to certify the Commission's selections, it must be specific as to why. Like the Commission, DEC is to be advised by the 13-member Advisory Committee appointed by the Governor and the DEC certification process must include public hearings. DEC must also prepare and publish a final EIS.

Facility Development and Operations

Once the site and disposal technology have been certified by DEC, the Energy Authority is directed to submit applications for all required State licenses and permits for construction and operation of the State's permanent LLRW disposal facilities. Complete license applications must be submitted to the cognizant regulatory agencies by January 1, 1990, seven months after the deadline for certification. At the same time, the Energy Authority is directed to take immediate steps to acquire the property required for the site.

Under New York's current regulatory program, licenses and permits would be required from both the State Department of Labor (DOL) and DEC. DOL will be requested to issue a radioactive materials license addressing the receipt and handling of waste incident to disposal. This license will deal primarily with occupational safety.

DEC will be requested to issue a permit (or permits) authorizing construction and operation of a waste disposal facility and any associated environmental discharges. This permit(s) will focus on controlling disposal activities to ensure that public health, safety and the environment are protected.

The Act provides for a coordinated licensing process and allows a maximum of 13 months for final action by the licensing agency following submission of completed applications. It should be noted that the State LLRWMA precludes consideration of a number of issues, including need, site, disposal method, and classes of waste to be disposed of, in the licensing process.

Once the required licenses and permits have been obtained, a determination must be made as to whether reasonable access is available to disposal facilities outside of New York for the LLRW that would otherwise go to the State permanent disposal facility. If reasonable access is not available, the Energy Authority is directed to proceed immediately to construct, operate and maintain the approved permanent LLRW disposal facilities. These facilities must be completed and begin operation no later than January 1, 1993. The Energy Authority has the option of either operating the facility itself (i.e., with its own employees) or hiring an operating contractor.

Financing

The State LLRWMA contains a number of provisions related to financing the costs associated with the development, operation and maintenance of the State's permanent LLRW disposal facility. Underlying these provisions is the assumption that these costs should be borne by the waste generators.

Pre-Operational Assessments. Prior to operation of the State's LLRW disposal facility, the

State LLRWMA provides for assessments on electric utilities with operating nuclear power plants to support the activities of DEC, the Siting Commission and the Department of Health. Following the initial assessment, which was payable December 31, 1986, assessments are to be imposed annually until the disposal facility commences operation. The formula for calculating the assessments takes into account the number of operating plants, over or under assessments from previous years and any surcharge rebates received by the State as provided for under the Federal LLRWPA.

Note that the assessments do not fund the facility development expenses of the Energy Authority, which include such major cost items as acquisition of the land, facility design and construction.

Once the facility is operating, the utilities with operating nuclear power plants will receive a credit with interest for these assessments.

Post-Operational User Fees. When the facility becomes operational, the State LLRWMA directs that all costs be recovered through user fees to be paid upon delivery of LLRW to the disposal facility. Fees will be established by the Energy Authority.

Recoverable costs include costs of development, licensing, operation, maintenance, debt service, post operational reserves, payments in lieu of taxes or fees, and aid to local governments. The State LLRWMA stipulates, however, that all capital costs incurred prior to operation shall be recovered over a minimum period of 20 years.

Reimbursement Agreements. To ensure that the State is reimbursed for any taxpayer money that may be advanced to support development of the disposal facility, the State LLRWMA directs the Energy Authority to enter into reimbursement agreements with the State Division of the Budget. These agreements are to specify how and when the State will be repaid.

Current plans are that one agreement will address the transfer of the pre-operational nuclear power plant assessments to recover expenses of DEC, the Siting Commission and DOH in carrying out their respective responsibilities. A second agreement would cover all other expenses that the State would have incurred in developing the disposal facility such as funds advanced to the Energy Authority for meeting its responsibilities.

Surcharge Rebates. The State LLRWMA specifically designates the Energy Authority to receive any surcharge rebates for which the State qualifies under the Federal LLRWPA. The Energy Authority is directed to use these funds to support the cost of disposal facility development generally, and specifically to reduce the amount of the pre-operational assessments imposed on the State's operating nuclear power plants.

Financial Assurance Requirements. As part of its regulatory role, the State LLRWMA directs DEC to promulgate, by January 26, 1988, regulations specifically defining financial assurance requirements. These regulations are to be included as conditions in permits for the disposal facility. They must cover remediation of failures, both during and after operation, facility closure, and post closure monitoring and maintenance.

Public Participation

The State LLRWMA provides specific direction for ensuring and enhancing the participation of interested and affected members of the public in the processes leading to the establishment of a New York State LLRW disposal facility. In addition to the Advisory Committee discussed previously, other important features include:

- A public information and education program to be conducted by DOH with the advice and assistance of the Advisory Committee;
- Hearings on DEC's proposed site and technology selection criteria;
- Hearings on DEC's certification of the Siting Commission's site and technology selection;
- Open, announced public meetings of the Siting Commission;
- Hearings as part of the licensing process for construction and operation of the disposal facility; and
- Making minutes of the Advisory Committee meetings available to the public.

Aid to Local Governments

The State LLRWMA directs DEC to evaluate the impacts a LLRW disposal facility, including its construction, operation, maintenance, closure, post closure care and related emergencies, can have on host local government units. DEC must also evaluate mechanisms for either mitigating or providing offsetting benefits with respect to such impacts and make recommendations to the Governor and Legislature on the matter. These evaluations and recommendations are to be incorporated in a report due to the Governor and Legislature on April 1, 1987.

LLRW Data Collection/Report to Governor and Legislature

The State LLRWMA provides a mechanism for establishing and maintaining a New York State LLRW data base to assist the State in developing a LLRW disposal facility. It requires LLRW generators in the State to submit annual reports to the Energy Authority detailing the classes and quantities of waste generated, stored by the generator for decay or later transfer or transferred by the generator to other facilities. In turn, the Energy Authority is directed to promulgate regulations providing procedures for the preparation and submission of such reports, including reasonable requirements for specific additional information on the nature and characteristics of such waste and LLRW treatment and storage practices. The State LLRWMA requires the first report to be submitted to the Energy Authority nine months following enactment (i.e., on April 27, 1987).

In a closely related provision, the State LLRWMA requires the Energy Authority to prepare and submit on July 1 of each year beginning with 1987, a report to the Governor and Legislature summarizing and categorizing by type of generator and region of generation the LLRW generated in the State during the previous calendar year. In addition to providing the basis for these reports, the LLRW data base will be used to estimate future LLRW generation, to size and design required disposal facilities, to develop waste acceptance criteria and disposal fee structures and

to assist in the selection of suitable sites and disposal technologies.

Related Regulatory Provisions

The State LLRWMA addresses a number of related regulatory matters including:

- Providing for on-site environmental monitors to verify compliance with permit conditions;
- Providing for on-site and off-site emergency plans;
- Requiring closure and post closure monitoring and maintenance plans;
- Requiring an estimate of the maximum cost of closure and post-closure care, and periodic revisions of such estimate to reflect both changes in plans and inflation; and
- Providing for exclusive State regulation.

Progress to Date

Since the enactment of the State LLRWMA, DEC, the Energy Authority and DOH, have taken steps to define and acquire the resources required to meet these assigned responsibilities.

DEC has begun the process of developing site and technology selection criteria and held a public meeting to receive comments on their scope and content. It also initiated the evaluation of the potential impacts, and related mitigation measures, on host local governments and contracted with Energy Systems Research Group of Boston, Massachusetts to assist in that effort.

To kick-off its public education and information program, DOH has contracted with Syracuse University to plan and organize a two-day technical conference, scheduled for March 18 and 19, 1987, to discuss candidate LLRW disposal technologies.

The Energy Authority has or is taking a number of actions including:

- requesting and receiving the LLRW surcharge rebates for which the State qualified;
- imposing and collecting the first LLRW assessment on operating nuclear power plants in the State. Bills for the FY 87-88 LLRW assessment were to be served on the plant operators on February 1, 1987;
- promulgating regulations regarding the preparation and submission of LLRW generator reports and developing a report form;
- developing a scope of work and Request for Proposal for architect/engineering services;
- drafting reimbursement agreements governing the repayment of money advanced by the State for the development of the State's LLRW disposal facility.

As of this writing, the Governor's office is considering candidates for appointment to the Siting Commission and the Advisory Committee. These appointments are expected to be made soon.

MEETING THE MILESTONES

Even this brief review of the State LLRWMA demonstrates that the Act provides all the necessary ingredients for New York State to meet the milestones of the Federal LLRWPA. Table I compares the relevant provisions of the State and Federal Acts. Governor Cuomo was able to certify on July 1, 1986 that the State intended to provide for the management of LLRW generated in the State, thereby meeting New York's initial milestone. The State LLRWMA clearly addresses the 1990 deadline for submission of a complete license application for construction and operation of a LLRW disposal facility. It also clearly provides for the 1993 deadline for management of LLRW generated in the State.

TABLE I

MILESTONE SCHEDULE

FEDERAL LLRW MILESTONES	NEW YORK STATE LLRW MANAGEMENT ACT
7-1-86	
o Ratify Compact, or Enact Legislation, or Governor Certify	o Governor certified 7-1-86 o Legislation passed 7-3-86 o Signed by Governor 7-26-86
1-1-88	
o Develop detailed siting plan, delegate authority	o DEC to publish final siting criteria 12-31-87 State LLRWMA - assigns responsibility - delegates authority - identifies critical actions - sets deadlines
1-1-90	
o File complete license application, or Governor certify that State will manage waste by 12-31-92	o Energy Authority must complete and submit all license/permit/approval applications for construction and operation by 1-1-90
1-1-93	
o Accept waste for disposal	o Energy Authority shall begin operation of a New York disposal facility by 1-1-93

The only milestone not directly addressed by the legislation is the 1988 siting plan. However, taken in its entirety, the State LLRWMA fully meets the intent of the Federal LLRWPA. The State LLRWMA establishes the required procedures and schedules and delegates the authority needed to meet the milestone. It also defines the optimum way for New York State to attain operation of a LLRW disposal facility and, where appropriate, provides for expedited review and action.

SOME CONCERNS

As described above, New York State has undertaken a comprehensive program to meet its LLRW management responsibility. However, there is not a lot of time to get everything done by January 1, 1993. Although the State LLRWMA establishes deadlines and provides some clear measures for expediting action, there is little or no slack time built into the schedule. Consequently, anything but the most minor delay in any of the defined critical steps will undoubtedly result in a corresponding delay in bringing the disposal facility into operation.

There is also a considerable technical challenge. New York State, as have a number of other states and compacts, has opted for new LLRW disposal technologies, leaving to its Siting Commission the choice of which one. In New York the selected technologies must incorporate engineered barriers to

waste migration and water invasion, must be monitorable, will likely incorporate some degree of retrievability and stricter public health and safety and environmental requirements than did earlier disposal technologies. Experience in the United States with most of the alternative technologies under consideration is limited, if there has been any experience at all. Consequently, New York and others are faced with a real technical challenge, including what will probably be the design and development of a first-of-a-kind LLRW disposal facility.

As with most new technologies, or new applications of existing technologies, there are likely to be unanswered, perhaps unanswerable questions. Yet this technical challenge will have to be met while maintaining a high level of public confidence, not only in the technology but in the process and in the various public bodies assigned major LLRW responsibilities.

There are also troubling issues concerning the economics of disposal. Currently operating sites use a relatively inexpensive shallow land burial technology. But New York and other states and compacts can be expected to select a new, higher cost option, such as aboveground, engineered, monitored disposal. Consequently, the unit cost of disposal will likely be considerably higher than what generators are now paying, even with the surcharges.

Further, unit costs will be higher due to fragmentation of the waste stream. That is, the volume of waste now going to Barnwell, Beatty, and Richland will be going to as many as fourteen new disposal facilities. Presumably, the cost of doing business will be higher for all LLRW generators. But LLRW generators located in the higher cost states/compacts will be at a distinct competitive disadvantage.

With higher costs, inequitably distributed among states and compacts, there undoubtedly will be pressure to return to a market approach to LLRW. While there is no reason to believe that this will be politically feasible, unit cost differentials may well lead to pressure for some adjustments in the number of operating facilities.

A major concern has been two unresolved "mixed waste" issues: how to define it, and how to comply with dual regulations. The lack of a clear definition has made it difficult to identify mixed waste in New York's waste stream or to estimate its future volumes. The dual regulation of mixed waste by the Nuclear Regulatory Commission (NRC) and the Environmental Protection Agency, (EPA) means that different, and apparently contradictory, disposal regulations apply to the same waste. Therefore, it has been difficult for New York State and other states and compacts to make decisions on appropriate technologies and procedures for managing mixed waste. NRC and EPA have recently made progress in addressing this matter. A definition of mixed waste and guidance on identification of mixed waste was jointly issued by those agencies in January 1987. However, additional clarification and guidance on the dual regulation issue is still required.

Certain radioactive wastes, which contain naturally occurring and/or accelerator produced radioactive material (NARM), are also a matter of concern. NARM is not subject to the regulatory jurisdiction of the NRC; consequently it does not fall within the definition of LLRW found in either the Federal LLRWPA or the new New York State LLRWMA. NARM is apparently subject to EPA's regulatory jurisdiction; but to date EPA has not established disposal criteria for such waste.

Radium is the principal NARM material of concern to New York, both because of its radiotoxicity and because substantial quantities are currently stored at a former Radium source manufacturing facility in New York City. Cognizant New York agencies have concluded that Radium and transuranic waste should be treated comparably with concentrations exceeding 100 nanocuries per gram being a Federal rather than a State disposal responsibility.

A final concern is the availability of qualified staff for the new LLRW programs and facilities. With the number of regions and states planning to establish and operate facilities, the competition for qualified LLRW managers, operators and technicians can be expected to exceed the available supply. Since the number of individuals with senior management experience in designing, licensing, constructing and operating a LLRW disposal facilities isn't very large, States and regions (or their designated contractors) may well find themselves in recruiting wars.