

# STATUS OF MAINE'S LOW-LEVEL RADIOACTIVE WASTE PROGRAM

Matthew Scott  
Executive Director  
Maine Low-Level Radioactive Waste Authority  
99 Western Avenue, Suite 101  
Augusta, Maine 04330  
Stewart N. Thompson  
Acres International Corporation  
140 John James Audubon Parkway  
Amherst, New York 14228-1180  
Walter A. Anderson  
John S. Williams  
Maine Geological Survey  
State House Station  
Augusta, Maine 04333

## ABSTRACT

During the latter part of 1987, the 113th Maine Legislative session created the Maine Low-Level Radioactive Waste Authority (the Authority). To meet the milestones established in the 1985 Low-Level Radioactive Waste Policy Amendments Act, the Authority submitted a Siting Plan to the DOE and sited states which was approved in the early part of 1988. The Authority has initiated a contract for preparing a site screening methodology and for evaluation and compiling a statewide geologic, hydrologic and environmental data base on a Geographic Information System (GIS) which will be addressed in the presentation. In addition, the paper will address the Authority's development of Community Impact and Public Information programs to involve the people of Maine throughout the site screening and selection process. A presentation of Maine's unique environment will be a part of this paper with concluding facts on existing climatological data.

## INTRODUCTION

This paper provides both a general overview of the status of Maine's low level radioactive waste (LLRW) program and a brief summation of the state's climatologic and geologic setting as it relates to siting a LLRW disposal facility.

## LEGISLATION AND SITING PLAN

In response to the requirements set forth in the Low-Level Radioactive Waste Policy Amendments Act (LLRWPA) of 1985 (Brown, 1986), Maine promulgated the Maine Low-Level Radioactive Waste Authority Act (the Act) which authorized the establishment of a Low-Level Radioactive Waste Authority to undertake the planning, siting, construction, operation and maintenance of a LLRW disposal facility in the state.

In the latter part of 1987, Governor John McKernan appointed a six member Authority consisting of Maine citizens qualified and knowledgeable in the fields of health, nuclear waste, construction engineering, environment, public administration and business. In addition, the Act required that the *State Geologist* be appointed as a voting member.

As required by the Act, the Authority prepared and submitted a Siting Plan in December 1987 to the Department of Energy (DOE) and the sited states (South Carolina, Nevada and Washington) showing the activities and schedule that the Authority intended to pursue in siting, licensing, designing and constructing a LLRW disposal facility within the state. The Plan showed the numerous

legislated approvals that were required before a facility could be sited and licensed within the state. These include:

- Approval by 60% of the governing body of the municipality where the facility is proposed to be located;
- Approval by the Board of Environmental Protection (BEP);
- Approval by the state legislature; and
- Approval by a state-wide referendum.

The Plan clearly demonstrated that the length of time to successfully achieve these approvals would extend the operational date for a LLRW disposal facility in Maine until the latter part of 1995, nearly three years past the federally legislated January 1, 1993 milestones. The Plan, although questioned by the sited states as to its achievability, was accepted in February 1988. Throughout 1988, the Authority and other state agencies have undertaken a number of activities to comply with the LLRWPA. These are briefly discussed below.

## CONTRACT WITH MAINE YANKEE POWER PLANT

The ACT required that a contractual agreement with the Maine Yankee Nuclear Power Plant (the only nuclear plant in the state) be reached prior to any area screening and site characterization or application for a license to operate a disposal facility. The contract had to provide for Maine Yankee to pay full cost of all these activities on or before the day those activities are completed. During 1988,

such a contract was negotiated and executed between the Authority and Maine Yankee.

**SITING METHODOLOGY AND SCREENING**

Following the establishment of an Authority office in Augusta and the hiring of an Executive Director and support staff, the Authority prepared and issued a Request for Proposals (RFP) to develop a site selection methodology and initiate site screening throughout the state. The RFP was issued in the summer of 1988; seven responses were received. A consultant was recently selected and work on this contract commenced in February 1989.

Work on this contract will be performed in two phases. Phase 1 will involve the preparation of a site selection methodology which will be used in screening the state and ultimately selecting potential candidate siting areas and specific sites for subsequent characterization and environmental assessment. The Authority plans that this methodology will be developed with maximum input from Maine citizens and public interest groups throughout the state.

Phase 2 of the project will involve the collection and compilation of a detailed database to be used in the site screening and selection process. Data to be collected during this phase will include:

Geology	Geomorphology
Surface and Groundwater	Transportation and Access
Hydrology	Utilities
Demography	Socioeconomic
Land Use and Recreation	Meteorology
Water and Air Quality	Mineral Resources
Tectonics and Seismicity	Terrestrial/Aquatic Ecology

All data will be input into a Geographic Information System (GIS).

Areas not having sufficient data for the screening process will be identified and brought to the attention of the Authority. If it is determined that those areas may be potentially suitable for LLRW facility, then the Authority may undertake additional data collection efforts to adequately evaluate these areas.

Once completed, the Authority will apply the site selection methodology developed under Phase 1 to identify candidate siting areas. These phases of work are expected to continue through 1989 and early 1990.

**COMMUNITY INFORMATION AND IMPACT PROGRAM**

During 1988 the Authority embarked on the structuring of a Community Education and Impact Program. The Authority realizes the importance of a comprehensive and integrated public information program and therefore considers it important to ensure that the program be designed to effectively impart information to the Maine public regarding the LLRW disposal activities as well as to receive and respond to specific questions and comments.

The Authority has prepared and distributed informational brochures regarding its activities. In addition,

preliminary meetings have been held with Maine Municipal leaders and other state officials to inform them of the Authority's function and schedule. These meetings are planned to continue on a more rigorous basis throughout 1989.

Most states and compacts have implemented various types of community benefits/incentives programs for potential and/or selected host communities. These benefits include such things as direct financial grants, tax incentives, shared revenues from the disposal operation, protection of local property values, benefits to local communities such as schools, fire departments, libraries, etc. (English, 1988).

The Authority believes that the selected host community should receive some form of compensation. The type and amount of compensation should be mutually decided between the Authority and the community. Therefore, a Community Impact Program is being structured to solicit input from Maine communities regarding a compensation package that is most acceptable to the Maine communities.

**COMPACTING**

Realizing that it is highly unlikely that Maine can meet the January 1, 1993 milestone, the Authority has evaluated a number of alternatives for complying with the LLRWPA.

The Governor's office has been diligently seeking a compact arrangement with another state and compact. This effort has resulted in a recent proposal by Maine to the state of Texas. The offer provides a one time financial incentive with a premium surcharge in excess of Texas' waste disposal costs for taking Maine's waste. As of this date, Maine has not yet received an answer to their proposal.

**TEMPORARY STORAGE**

Pursuant to joining a compact, the Authority is considering the use of temporary storage of its waste to meet the 1993 milestone. To accomplish this, the Authority has proceeded with submitting modifications to the Maine legislature to allow the Authority to site, license, design, construct and operate a LLRW storage facility. The Maine Siting Plan has been revised showing a LLRW storage facility operational by January 1, 1993. This approach allows for the ongoing work on siting and licensing of a permanent disposal site to proceed in a logical and timely manner without being "driven" by legislated milestones.

**MAINE'S HYDROGEOLOGIC ENVIRONMENT**

Several features of Maine's hydrogeology complicate the siting and operation of waste disposal facilities. The state has moderate to severe winters, with a short growing season and abundant snowfall. Maine is divided into three climatic zones in which data have been collected (Fig. 1). Precipitation varies from 40-45 inches per year across the state (Table I). Precipitation greatly exceeds evaporation. This, combined with poorly drained soils, causes the water table in most areas to be very high; commonly within 5 to 10 feet of land surface. Depth to water rarely exceeds 50 feet.

Maine's bedrock is predominantly crystalline metasedimentary and plutonic rocks of Pre-Cambrian to Devonian age (Osberg, et al., 1985). These rocks have

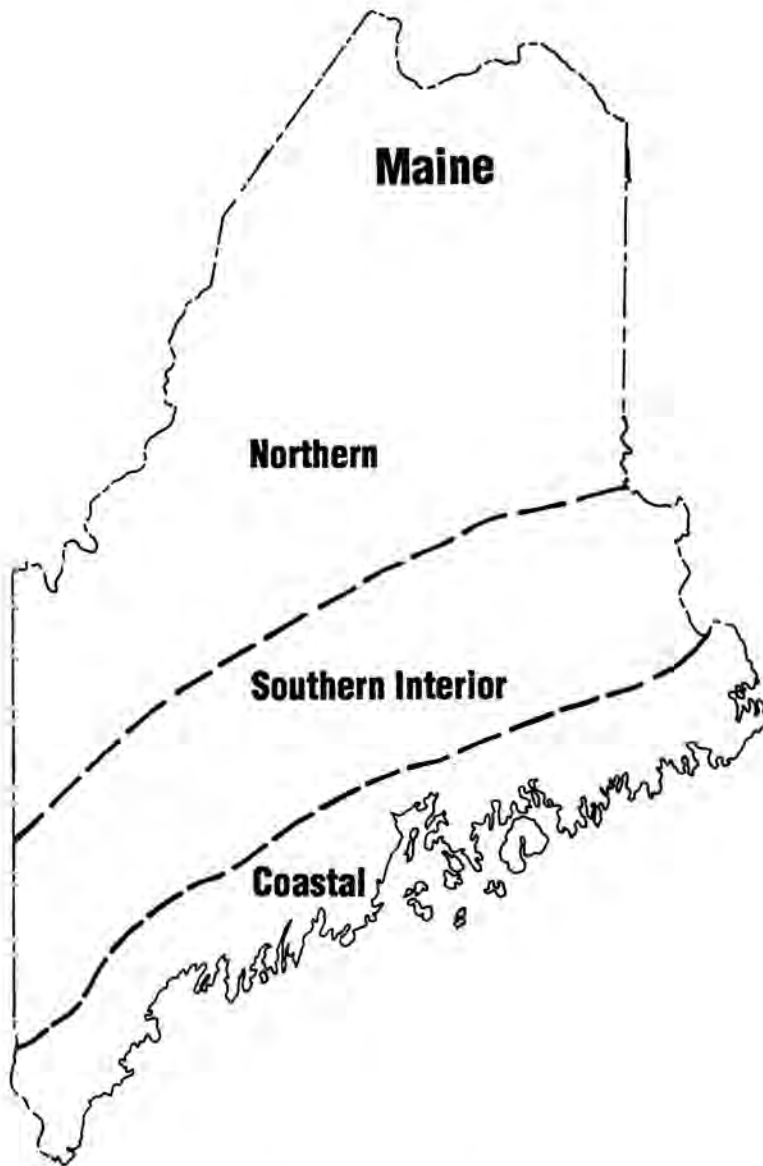


Fig. 1. Climatological Map.

essentially no primary permeability, but are often extensively fractured, allowing transport of ground water. Fractured bedrock aquifers are utilized by approximately 35 percent of Maine's population (70 percent of the rural population) as a drinking water source. Well yields are often low, averaging approximately 5 gallons per minute, but are usually sufficient for domestic use. Downward flow gradients make wells in fractured rock highly susceptible to ground water contamination from gasoline, road salt, pesticides, and hazardous waste (unpublished data, Maine Department of Environmental Protection).

Maine's surficial geologic deposits are mostly thin (0 to 100 feet) and of glacial origin, having been deposited during

late Wisconsin times (Thompson, 1979). Ablation till is the predominant surficial deposit, but extensive areas of sand and gravel (eskers, kames, deltas, and outwash deposits), basal till, and silt/clay are also present. The sand and gravel deposits provide the state's most abundant aquifers, and are utilized for municipal water supplies in many areas. The tills and silt/clay deposits offer the best attenuation with wetlands. The silt/clay deposits can also be geotechnically unstable.

Due to these hydrogeological complexities, shallow land burial is explicitly prohibited by Maine statute. Any disposal site selected for Maine's low level radioactive waste

**TABLE I**  
Maine Climatological Data (Average Values)

Characteristic	Northern Zone	Southern Interior Zone	Coastal Zone
Annual Precipitation* (Inches)	45	42	40
Annual Snowfall* (Inches)	110	85	75
Depth to Groundwater (Feet)	5-10	5-10	5-10
Minimum Temperature* (Degrees Fahrenheit)	-30	-20	-10
Maximum Temperature* (Degrees Fahrenheit)	92	95	96
Average Length of Growing Season (Days)	110	145	160

\*Data from National Oceanic and Atmospheric Administration (1987).

will need to rely on engineered structures in combination with geologic barriers.

**SUMMARY**

We have presented a general overview on the status of Maine's LLRW program and our efforts thus far to meet the intent of the Federal act as well as Maine law. The Authority is going to be collecting significant sets of data on Maine's environment which will be compiled into a geographic information system. Maine is serious about its responsibility to deal with its waste, and is working on siting a disposal facility in maine which will provide safe disposal and take into account the state's unique environmental circumstances.

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