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**South Carolina State Briefing Book
for
Low-Level Radioactive
Waste Management**

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SOUTH CAROLINA STATE BRIEFING BOOK
FOR
LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

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INTRODUCTION

This South Carolina State Briefing book for Low-Level Radioactive Waste Management has been prepared to assist in the orderly planning and implementation of safe, adequate low-level radioactive waste disposal facilities. The book is one of a series of briefing books being prepared that will provide background information on waste management practices in all states.

Of six commercial low-level radioactive waste disposal sites that have operated within the United States, only three are currently accepting additional wastes. Of these, two have been closed intermittently because of various irregularities in disposal and shipping operations. In 1979, approximately 80 percent of the wastes were shipped to the South Carolina site.

Projections of total national low-level radioactive waste generation and capacity of existing commercial disposal facilities indicate that if no change in present practices or trends occurs, the current disposal sites could be filled by the mid-1990s. Recent proposed limitations of yearly burial quantities to be accepted by disposal sites in the states of South Carolina and Washington will reduce availability of burial space. South Carolina's limit on waste receipts will be reduced to 100,000 cubic feet per month by October 1981, and Washington will likely restrict use of the Richland site after 1982. It is possible that by the mid-1980s there could be more waste volume generated per year than could be buried.

Section 2 of this Briefing Book presents an overview of past and present low-level radioactive waste management practices within the state of South Carolina. Section 3 identifies those demographic and economic factors and trends that affect or can be related to the quantity and nature of low-level

radioactive wastes within the state. Section 4 presents an overview of South Carolina's state government and identifies government institutions and agencies with statutory or other responsibilities affecting the generation, handling, and disposal of radioactive wastes within the state. The identities of state officials and other organizations concerned with on this issue are presented in the text. Section 5 presents the methodology employed for conducting a direct mail survey of radioactive material licensees within the state to obtain basic information on disposal practices. The results of this survey are presented in Section 6.

OVERVIEW OF LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT
IN SOUTH CAROLINA

There are approximately 365 radioactive material licensees in the state of South Carolina. These licensees generated approximately 4,940 cubic meters of low-level radioactive waste in 1978.¹ South Carolina's commercial power reactors accounted for 62 percent of the total waste generated within the state.² Industrial wastes accounted for 30 percent, while institutional, government, and military wastes accounted for the remaining 8 percent.³

Current Disposal Practices

In 1979 8,089 cubic meters of low-level radioactive waste generated by South Carolina licensees was disposed of at commercial burial facilities. Over 99 percent of the waste was shipped intrastate to the Barnwell disposal site, the remainder to Richland, Washington.⁴ Thirty percent of the waste disposed of at commercial burial facilities was generated by commercial power reactors.⁵ The remaining 70 percent was generated by industrial, institutional, government, and military facilities.⁶

Regulatory Enforcement

The U.S. Atomic Energy Commission (AEC) was the first agency to develop regulations for the control of low-level radioactive wastes. The U.S. Energy Research and Development Agency, Department of Energy, Nuclear Regulatory Commission, Environmental Protection Agency, and Department of Transportation have all promulgated regulations affecting radioactive waste management. In 1969, South Carolina was designated as an "Agreement State" with specific regulatory authority to control and regulate low-level radioactive material.

South Carolina and the states of Nevada and Washington have regulations covering the packaging and shipping of low-level radioactive wastes. Shipments of level wastes that are improperly packaged or are in violation of NRC regulations may be rejected at the disposal site.

Introduction

This demographic study for South Carolina is designed to analyze various demographic factors, data, and trends that could be related to the quantity, nature, and potential management options of low-level radioactive wastes within the state and its political subunits.

State Economic Areas

The study covers the State of South Carolina as a whole and its subunits, namely, its State Economic Areas (SEAs). State Economic Areas are frequently used in demographic studies of states because states are generally heterogeneous in terms of urban-rural distributions, climate, industry, topography, population size and growth, and economic activity that it is infeasible to investigate these phenomena strictly at the state level. It is necessary to reduce the state's geography into smaller units, but not so small that their number becomes too cumbersome for analysis, as might be the situation if one were to break the state down into counties. The State Economic Area is an appropriate unit for the subject in this study, midway between the state and the county.

State Economic Areas are relatively homogeneous subdivisions of a state, consisting of single counties or groups of counties that have similar economic and social characteristics. The boundaries of these areas have been drawn in such a way that each state is subdivided into relatively few parts, with each part having significant characteristics that distinguish it from adjoining areas.

In the establishment of State Economic Areas, factors in addition to industrial and commercial activities were taken into account. Demographic, climatic, physiographic, and cultural factors, as well as factors pertaining more directly to the production and exchange of agricultural and non-agricultural goods, were examined.

State Economic Areas that contain the counties of the larger Standard Metropolitan Statistical Areas (SMSAs), metropolitan areas that in 1960 had central cities of 50,000 or more and total populations of 100,000 or more, are recognized as metropolitan SEAs and are designated by the name of the respective metropolitan areas. The bulk of the SEAs, however, are nonmetropolitan and have names that reflect either their locations in their states, their particular economic activities, or both. The nonmetropolitan SEAs are identified numerically, the metropolitan SEAs with letters.

The State of South Carolina is divided into 12 State Economic Areas, eight of which are nonmetropolitan: SEA 1: South Carolina Blue Ridge - Piedmont Transition; SEA 2: Northwestern South Carolina Piedmont; SEA 3: North Central South Carolina Piedmont; SEA 4: South Carolina Lower Piedmont; SEA 5: South Carolina Sand Hills; SEA 6: South Carolina Upper Coastal Plain; SEA 7: Pee Dee River; and SEA 8: South Carolina Coast. The remaining four SEAs are metropolitan: SEA A: Columbia SMSA; SEA B: Augusta SMSA (South Carolina part); SEA C: Charleston SMSA; and SEA D: Greenville SMSA. These SEAs are outlined and identified, along with major cities in the state, in Map 3.1. The counties in each SEA are listed in the appendices.

Map 3.1 The State Economic Areas of South Carolina

3.1 Population and Location

Population data is presented because the use of certain radioactive materials can be related to population and age structure. The population of South Carolina on April 1, 1980 was 3,119,208, according to a final count of the returns of the 1980 Census of Population. This figure is an increase of some 528,000, or over 20 percent, from the 2,590,713 inhabitants counted in the 1970 Census. In this section the population of the state and its SEAs is described in terms of their age composition in 1978, 1980, and 1990. The data for 1980 and 1990 are based on population projections and the data for 1978 on population estimates developed by the Bureau of the Census. At the time of this writing, age and sex data from the 1980 Census have not yet been released.

Population bar graphs have been developed for the state and each SEA that depict age compositions. Figures 3.1.1 through 3.1.12 are for the SEAs and Figure 3.1.13 for the state as a whole.

These graphs show that the metropolitan SEAs (Figures 3.1.A through 3.1.D) are largely characterized by concentrations of young men and women in the late teens through the mid-to-late 20s, a distribution generally observed in most metropolitan areas. Compared to the nonmetropolitan SEAs (Figures 3.1.1 through 3.1.8), the metropolitan SEAs have slightly fewer persons in the younger ages proportionately.

Table 3.1 presents population projection data for the SEAs and the state for 1980 and 1990. Nineteen-eighty 1980 data are provided on the basis of projections based on assumptions generally governing demographic conditions of fertility, mortality, and migration as they existed in the

Figure 3.1.1 SEA 1
South Carolina Blue Ridge
Piedmont Transition

Figure 3.1.2 SEA 2
Northwestern South Carolina Piedmont

Figure 3.1.3 SEA 3
North Central South Carolina Piedmont

Figure 3.1.4 SEA 4
South Carolina Lower Piedmont

Figure 3.1.5 SEA 5
South Carolina Sand Hills

Figure 3.1.6 SEA 6
South Carolina Upper Coastal Plain

Figure 3.1.7 SEA 7
Pee Dee River

Figure 3.1.8 SEA 8
South Carolina Coast

Figure 3.1.A SEA A
Columbia SMSA

Figure 3.1.B SEA B
Augusta SMSA
(South Carolina part)

Figure 3.1.C SEAC
Charleston SMSA

Figure 3.1.D SEA D
Greenville SMSA

Figure 3.1.13
Population of South Carolina

Table 3.1 Demographic Growth and Density Information for the
State of South Carolina and its State Economic Areas

<u>State Economic Area</u>	<u>Population Growth Rate 1970 - 1975</u>	<u>Growth Rate Due to Net Migration 1970 - 1975</u>	<u>Population Density per Square Mile 1975</u>	<u>Population Projection 1980</u>	<u>Population Projection 1990</u>
SEA 1 SC Blue Ridge-Piedmont Trans.	12.0%	7.7%	97	130,332	157,762
SEA 2 Northwestern SC Piedmont	8.1%	4.3%	149	447,702	522,642
SEA 3 North Central SC Piedmont	6.4%	1.5%	89	259,787	289,793
SEA 4 SC Lower Piedmont	2.3%	-1.7%	35	115,359	114,659
SEA 5 SC Sand Hills	4.0%	-1.2%	45	76,416	81,272
SEA 6 SC Upper Coastal Plain	5.4%	-0.1%	59	370,620	405,908
SEA 7 Pee Dee River	10.5%	4.4%	73	314,439	373,955
SEA 8 South Carolina Coast	15.2%	6.1%	51	285,989	364,674
SEA A Columbia SMSA	13.0%	8.8%	249	431,796	549,729
SEA B Augusta SMSA (SC part)	4.6%	-0.7%	87	103,251	112,563
SEA C Charleston SMSA	5.1%	-0.4%	277	281,179	315,802
SEA D Greenville SMSA	10.2%	5.5%	335	302,528	363,248
State of South Carolina	8.6%	3.3%	93	3,119,398	3,652,225

last half of the 1960s and the early 1970s. In the case of migration, trends in the state and its SEAs through 1978 were used to generate 1980 projections.

The 1980 data in Table 3.1 show the continued prominence of three SEAs in total population: SEA 2: Northwestern South Carolina Piedmont; SEA 6: South Carolina Upper Coastal Plain; and SEA A: Columbia SMSA. The data presented for 1990 in Table 3.1 suggest the continued predominance of these SEAs as the major population focal points in the state.

Demographic growth and density information for South Carolina and its SEAs is also presented in Table 3.1. Rates of population growth between 1970-75 are included, along with growth rates due to net migration. Data on population density (number of persons per square mile) are also presented. These data are of interest because a population with a positive rate of growth over a five-year period, particularly one with a positive rate due to net migration, would imply increasing isotope use and waste generation. The Greenville, Charleston, and Columbia SEAs are the most densely populated, with 335, 277, and 249 persons per square mile.

Another way of viewing demographic patterns and changes in South Carolina and its SEAs is through maps. Maps reflecting rates of overall population growth for South Carolina SEAs (Map 3.2) and patterns of population density per square mile for the SEAs according to three categories of density (Map 3.3) are included.

Map 3.2 Rates of Population Change Between 1970 and 1975 for the State Economic Areas of South Carolina

Map 3.3 Population Density (Persons per Square Mile) for the State Economic Areas of South Carolina

3.2 Agriculture

Demographic data on agriculture for South Carolina and its SEAs indicate those areas within the state heavily engaged in agricultural pursuits. Data of this type could be influential in determining which areas within the state could be candidates for facilities for low-level radioactive waste management, and which areas should not be.

Table 3.2 presents information for the state and its SEAs on the total amount of land in farms (expressed in thousands of acres) in 1974 and 1978, the percent of all land devoted to farming in 1974 and 1978, and the average value of land and buildings per farm (in thousands of dollars) in 1974 and 1978.

Acreage designated as "land in farms" consists primarily of agricultural land used for crops, pasture, or grazing. It also includes woodland and wasteland not actually under cultivation or used for pasture or grazing, provided it was part of the farmer's total operation. Large acreages of woodland or wasteland held for nonagricultural purposes were deleted from individual reports during the census processing procedures. Except for open range and grazing land used under government permits, all grazing land was included as "land in farms," provided the place was part of a farm or ranch.

The State Economic Area in South Carolina with the greatest number of acres devoted to farming in 1978 was SEA 6: South Carolina Upper Coastal Plain, with over 1.9 million acres, a slight increase over the acreage devoted to farming in 1974. The Charleston SMSA (SEA C) had the fewest acres devoted to farming in 1978. In the total amount of land in the area

Table 3.2 Agricultural Data for the State of South Carolina
and its State Economic Areas, 1974 and 1978

<u>State Economic Area</u>		<u>Land in Farms</u> <u>Total Acres in 1,000s</u>		<u>Average Value of</u> <u>Land and Buildings</u> <u>per Farm in \$1,000s</u>		<u>Percent of</u> <u>Land Devoted</u> <u>to Farming</u>	
		<u>1974</u>	<u>1978</u>	<u>1974</u>	<u>1978</u>	<u>1974</u>	<u>1978</u>
SEA 1	SC Blue Ridge-Piedmont Transition	148	120	88	101	20.1	16.3
SEA 2	Northwestern SC Piedmont	594	585	87	140	33.9	33.6
SEA 3	North Central SC Piedmont	509	477	94	131	29.6	27.8
SEA 4	SC Lower Piedmont	582	548	97	147	28.9	27.2
SEA 5	SC Sand Hills	264	251	88	143	26.2	24.9
SEA 6	SC Upper Coastal Plain	1849	1920	117	225	47.2	49.0
SEA 7	Pee Dee River	999	994	84	182	41.2	41.0
SEA 8	South Carolina Coast	669	617	99	174	21.9	20.0
SEA A	Columbia SMSA	231	208	130	162	24.6	22.1
SEA B	Augusta SMSA (SC part)	173	161	91	146	24.8	23.1
SEA C	Charleston SMSA	75	64	159	226	12.4	10.6
SEA D	Greenville SMSA	87	93	92	130	17.1	18.3
State of South Carolina		6177	6321	99	146	31.9	32.6

devoted to farming, the South Carolina Upper Coastal Plain (SEA 6) had the highest percentage in 1978, with about 49 percent of its land devoted to agriculture. As expected, the Charleston SMSA had the smallest portion of its land devoted to this purpose.

The Charleston SMSA had the highest average value of land and buildings per farm in 1978. After adjusting for inflation, this 1978 value represents an approximate 8 percent increase over the average value in 1974. The SEA with the largest acreage and the greatest proportion of land devoted to farming, the South Carolina Upper Coastal Plain, had the second highest average value of land and buildings per farm in 1978. This figure represents a 46 percent increase over its 1974 value, after adjusting for inflation. The average value of land and buildings per farm in South Carolina in 1978 was \$146,000, an adjusted increase of some 12 percent over its 1974 value.

3.3 Health

This section analyzes health data for the State of South Carolina and its State Economic Areas. This information is provided because of the importance of radioactive materials at many health care facilities. Table 3.3 provides the following information for 1975: number of hospitals, number of hospital beds, hospital beds per 100,000 population, and physicians per 100,000 population. The data on hospitals and beds were collected by the American Hospital Association for all hospitals accepted for registration by the Association. The data on physicians were collected by the American Medical Association and refer to professionally active non-federal physicians.

In absolute numbers of hospitals and beds, Columbia (SEA A) and Charleston (SEA C) lead. The distribution of hospital beds and physicians

Table 3.3 Health Information for the State of South Carolina
and its State Economic Areas, 1975

<u>State Economic Area</u>	<u>Number of Hospitals</u>	<u>Number of Hospital Beds</u>	<u>Hospital Beds per 100,000 Population</u>	<u>Physicians per 100,000 Population</u>
SEA 1 SC Blue Ridge-Piedmont Transition	3	363	325	60
SEA 2 Northwestern SC Piedmont	8	1777	434	113
SEA 3 North Central SC Piedmont	8	1104	462	56
SEA 4 SC Lower Piedmont	6	243	219	49
SEA 5 SC Sand Hills	2	278	391	61
SEA 6 SC Upper Coastal Plain	13	1260	348	62
SEA 7 Pee Dee River	13	1323	473	83
SEA 8 South Carolina Coast	6	569	232	57
SEA A Columbia SMSA	11	7237	1982	154
SEA B Augusta SMSA (SC part)	1	138	145	70
SEA C Charleston SMSA	8	2057	790	287
SEA D Greenville SMSA	9	1349	507	143
State of South Carolina	88	17698	629	111

calculated on a per population basis is more even than when calculated as absolute counts. It would appear that these urban SEAs are the major sites for radionuclide use in a hospital/ medical context in South Carolina.

3.4 Higher Education

Colleges and universities are major users of radionuclides. Table 3.4 provides information on higher education in South Carolina and its SEAs for the academic years 1974-75 and 1977-78. In the year ending in 1975, there were 53 colleges and universities in South Carolina with a student enrollment of over 100,000. Three years later the number of institutions had increased to 61, and the student enrollment had increased to more than 130,000.

The geographical distribution of institutions of higher education and student enrollments in South Carolina is uneven, with three SEAs containing over 59 percent of institutions and over 53 percent of student enrollments: Northwestern South Carolina Piedmont (SEA 2), Columbia (SEA A), and Charleston (SEA C). The largest university in the state, the University of South Carolina (Columbia) is located in SEA A. The second largest university, Clemson, is located in SEA 1: South Carolina Blue Ridge - Piedmont Transition.

Consideration of isotope use and management should focus mainly on the Northwestern South Carolina Piedmont SEA, the Columbia and Charleston SEAs, and on SEA 1, South Carolina Blue Ridge - Piedmont Transition. These SEAs contain the bulk of student enrollments in the state.

Table 3.4 Information on Institutions of Higher Education for the State of South Carolina
and its State Economic Areas: Academic Years 1974-75 and 1977-78

<u>State Economic Area</u>	<u>Number of Post-Secondary Schools</u>		<u>Post-Secondary School Enrollments</u>	
	<u>1974-75</u>	<u>1977-78</u>	<u>1974-75</u>	<u>1977-78</u>
SEA 1 SC Blue Ridge-Piedmont Transition	2	2	9,777	11,878
SEA 2 Northwestern SC Piedmont	10	12	11,630	16,445
SEA 3 North Central SC Piedmont	6	7	6,734	8,497
SEA 4 SC Lower Piedmont	2	2	1,554	1,539
SEA 5 SC Sand Hills	1	1	372	579
SEA 6 SC Upper Coastal Plain	8	10	8,230	11,338
SEA 7 Pee Dee River	4	5	7,017	8,462
SEA 8 South Carolina Coast	1	2	320	1,377
SEA A Columbia SMSA	7	8	29,157	34,750
SEA B Augusta SMSA (SC part)	2	2	1,238	2,642
SEA C Charleston SMSA	6	6	13,559	18,412
SEA D Greenville SMSA	4	4	10,846	14,449
State of South Carolina	53	61	100,434	130,368

3.5 Government

Demographic data on government employment and revenues in South Carolina and its SEAs provide information on the scope of local, state, and federal government activities and the extent to which they have changed in magnitude in recent years.

Data on government employment and payrolls are provided on Table 3.5. The SEA with the greatest amount of government employees is the Columbia SMSA, with more than 13,000 full-time equivalent government employees in 1977. The Northwestern South Carolina Piedmont SEA and the South Carolina Upper Coastal Plain SEA run a close second and third, having almost 13,000 government employees in 1977. The State of South Carolina as a whole had the equivalent of more than 93,000 full-time government employees in the same year, an increase of about 21 percent over 1972 levels.

As expected, the Columbia SMSA also has the most extensive local government payroll in the state. In terms of 1972 dollars, the payroll in the Columbia SMSA increased by 47 percent between 1972 and 1977, for a total of over \$10 million. In the state as a whole, payrolls increased by about 27 percent in the same five year period.

Table 3.6 presents general revenue data, total intergovernmental revenue data, and the amount of intergovernmental revenue from the federal government for 1972 and 1977. The Northwestern South Carolina Piedmont SEA had the largest amount of general governmental revenue in 1977 in the state, more than \$226 million. This amount constitutes a gain between 1972 and 1977 of about 35 percent in terms of adjusted 1977 dollars. The Columbia SMSA had the largest rate of increase in revenue received from

Table 3.5 Government Employment and Payroll Data for the
State of South Carolina and its State Economic Areas

<u>State Economic Area</u>	Government Employment ¹			Local Government Payroll ²		
	1972	1977	ratio 1977/72	Oct. 1972	Oct. 1977	adj. ratio ³ 1977/72
SEA 1 SC Blue Ridge-Piedmont Trans.	2,462	3,003	1.21	1.7	2.9	1.29
SEA 2 Northwestern SC Piedmont	11,308	13,311	1.17	6.4	10.5	1.25
SEA 3 North Central SC Piedmont	7,067	8,188	1.15	3.8	6.1	1.23
SEA 4 SC Lower Piedmont	3,303	3,680	1.11	1.6	2.5	1.18
SEA 5 SC Sand Hills	2,543	2,880	1.13	1.3	2.1	1.20
SEA 6 SC Upper Coastal Plain	10,554	12,114	1.14	5.7	9.1	1.22
SEA 7 Pee Dee River	7,771	9,351	1.20	4.2	7.0	1.28
SEA 8 South Carolina Coast	6,560	8,229	1.25	3.4	5.9	1.33
SEA A Columbia SMSA	9,799	13,350	1.36	5.6	10.8	1.47
SEA B Augusta SMSA (SC part)	2,773	2,912	1.05	1.6	2.1	1.00
SEA C Charleston SMSA	6,661	8,918	1.34	4.1	6.7	1.25
SEA D Greenville SMSA	6,343	7,786	1.23	3.9	6.4	1.25
State of South Carolina	77,144	93,722	1.21	43.3	72.2	1.27

1 Government employment is expressed in terms of full-time equivalents.

2 Local government payrolls are expressed in millions of dollars.

3 As a control for inflation, the adjusted ratio of 1977 to 1972 payroll was computed after converting the 1977 payroll dollars into their equivalent on the basis of 1972 dollars.

Table 3.6 Government Finance Data for the State of South Carolina and its State Economic Areas

State Economic Area	General Revenue in millions of dollars ¹ adj. ratio ²			Total Intergovernmental Revenue in millions of dollars ³ adj. ratio ²			Intergovernmental Revenue from the Federal Govern (percentage)	
	1972	1977	1977/72	1972	1977	1977/72	1972	1977
SEA 1 SC Blue Ridge-Piedmont Trans.	20.7	38.0	1.39	10.4	19.8	1.45	2.5	3.9
SEA 2 Northwestern SC Piedmont	127.7	226.0	1.35	50.9	93.3	1.39	13.0	20.4
SEA 3 North Central SC Piedmont	63.1	109.9	1.32	28.1	50.7	1.37	10.1	15.9
SEA 4 SC Lower Piedmont	25.5	42.7	1.27	15.8	27.4	1.32	17.1	26.9
SEA 5 SC Sand Hills	21.4	36.4	1.29	9.6	16.9	1.34	5.8	9.1
SEA 6 SC Upper Coastal Plain	84.1	145.1	1.31	50.9	91.0	1.36	5.8	9.1
SEA 7 Pee Dee River	76.8	138.9	1.38	44.1	82.7	1.43	19.3	30.3
SEA 8 South Carolina Coast	52.3	98.6	1.43	31.7	61.9	1.49	17.2	27.0
SEA A Columbia SMSA	97.2	209.8	1.65	37.8	78.0	1.58	11.3	23.8
SEA B Augusta SMSA (SC part)	24.4	30.6	.96	12.6	18.5	1.12	10.0	12.4
SEA C Charleston SMSA	69.9	122.7	1.34	31.3	57.0	1.39	16.5	24.9
SEA D Greenville SMSA	69.8	131.8	1.44	28.0	63.7	1.74	7.1	28.6
State of South Carolina	733.0	1330.7	1.39	351.2	661.3	1.44	12.1	21.3

1 General revenue data are exclusive of interlocal revenue and are for the fiscal year which closed at various dates for each government during the 12 months ending June 30 of the particular year.

2 As a control for inflation, the adjusted ratio of 1977 to 1972 payroll was computed after converting the 1977 payroll dollars into their equivalent on the basis of 1972 dollars.

3 Intergovernmental revenue data are exclusive of interlocal revenue.

the federal government between 1972 and 1977, about 65 percent, and a general governmental revenue in 1977 nearly equal to that of the Northwestern South Carolina Piedmont, almost \$210 million. The State of South Carolina had total revenues in 1977 of over \$1.3 billion, an adjusted increase of about 39 percent over 1972 revenues.

In total intergovernmental revenue in 1977, the Northwestern South Carolina Piedmont SEA again was the most prominent State Economic Area in South Carolina, with over \$93 million. The state as a whole had over \$661 million in intergovernmental revenue in 1977. The Northwestern South Carolina Piedmont SEA received over 20 percent of its intergovernmental revenue from the federal government and the State of South Carolina more than 21 percent.

3.6 Economy

This section describes the economy and distribution of economic activities in South Carolina in 1974 and 1978. Table 3.7 presents nine industrial categories and indicates the number of employees, annual payroll, and growth of payrolls between 1974 and 1978 for each category. The data reported pertain mainly to employment covered by the Federal Insurance Contributions Act (FICA). The data thus cover all workers except government and railroad employees, self-employed persons, and a small number of others.

The information describing industrial activities for South Carolina was taken from statistics provided in County Business Patterns, a source developed and published through the U.S. Bureau of the Census. County Business Patterns provides an annual report on the economic activities of all counties in the United States. In the following analysis, county data were aggregated into state data.

The manufacturing industry provided the major economic base for the state. In 1974 there were 380,584 manufacturing employees with an annual payroll of almost \$3 billion. In 1978 the state continued to exhibit the same general type of industrial concentration and distribution. The manufacturing industry group payrolls experienced an increase of 9 percent between 1974 and 1978, after adjusting for inflation, to an annual payroll total of over \$4.2 billion. Increases also occurred in most of the other industrial activities. For example, 1978 payrolls in the contract construction, retail trade, and services industry groups were all over \$1 million annually. The contract construction industry group experienced the greatest growth between 1974 and 1978 with a 52 percent increase in annual payroll over the period.

Table 3.7 Economic Data¹ for the State of South Carolina

<u>Industry Group</u>	<u>1974</u>		<u>1978</u>		Change in economic payrolls ² between 1974 & 1978
	Number of employees for week including March 12	Annual Payroll in \$1,000	Number of employees for week including March 12	Annual Payroll in \$1,000s	
Agricultural services, forestry, fisheries	3,245	20,696	4,092	34,773	1.28
Mining	1,719	16,689	1,469	16,722	.76
Contract construction	66,834	508,751	78,874	1,013,625	1.52
Manufacturing	380,584	2,942,882	378,441	4,218,499	1.09
Transportation and other public utilities	30,318	286,098	34,305	472,550	1.25
Wholesale trade	39,771	461,468	44,542	522,955	.86
Retail trade	132,605	683,062	154,765	1,037,396	1.15
Finance, insurance and real estate	34,678	294,583	38,700	428,949	1.11
Services	100,636	594,654	130,842	1,021,325	1.31

1 Excludes government employees, railroad employees, and self-employed persons.

2 Change in payroll expressed as ratio of 1978 payroll to 1974 payroll (in constant dollars).

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- Shryock, Henry S. and Siegel, Jacob S., The Methods and Materials of Demography; Volume 2, Chapter 24, U.S. Government Printing Office, Washington, D.C.: April 1981.
- U.S. Bureau of the Census, 1980 Census of Population and Housing, Final Population and Housing Unit Counts, PHC80-V-1; U.S. Government Printing Office, Washington, D.C.: April 1981.
- U.S. Bureau of the Census, County Business Patterns, 1974, and County Business Patterns, 1978; Washington, D.C.; machine readable data files.
- U.S. Bureau of the Census, County and City Data Book, 1972; Washington, D.C.; magnetic tape version.
- U.S. Bureau of the Census, Census of Governments, 1977; Washington, D.C.; machine readable data files.

This section describes the structure and jurisdiction of South Carolina's executive, legislative, and judicial branches. A summary of state statutes and regulations relevant to low-level radioactive waste management and a discussion of public interest groups that either have expressed or may have an interest in radioactive waste management is also included.

4.1 Major Political Parties

The Democratic party has been the majority party in South Carolina since the Reconstruction Period. Democrats control 41 of the 46 seats in the South Carolina Senate and 107 of the 124 seats in the South Carolina House of Representatives. Governor Riley is also a Democrat.

4.2 South Carolina Delegation

South Carolina's United States Senators and Congressmen are:

Senators

Strom Thurmond (R)
209 Russell Senate Office Building
Washington, D.C. 20510
(202) 224-5972

Senator Thurmond began service in the U.S. Senate in 1956. He is Chairman of the Judiciary Committee and a member of the Armed Services and Veteran's Affairs Committees.

Ernest F. Hollings (D)
115 Russell Senate Office Building
Washington, D.C. 20510
(202) 224-6121

Senator Hollings began service in the U.S. Senate in 1966. He is the ranking minority member of the Budget Committee and a member of the Appropriations and Commerce, Science, and Transportation Committees.

Representatives

Thomas F. Harnett (R)
509 Cannon House Office Building
Washington, D.C. 20515
(202) 225-3176
(1st District)

Congressman Harnett was first elected to the U.S. House of Representatives in 1980. He is a member of the Armed Services Committee.

Legend

DISTRICT BOUNDARIES _____

DISTRICT NUMBERS (2)

COUNTY LINES - - - - -

Congressional Districts
OF SOUTH CAROLINA

The map shows the following counties and their corresponding Congressional Districts:

- District 1:** Charleston, Colleton, Dorchester, Beaufort, Jasper, Hampton, Allendale, Barnwell, Orangeburg, Calhoun, Richland, Sumter, Florence, Marion, Dillon, Horry.
- District 2:** Aiken, Edgefield, McCormick, Abbeville, Anderson, Oconee, Pickens, Greenville, Spartanburg, Union, Chester, Lancaster, Chesterfield, Marlboro, Darlington, Lee, Kershaw, Fairfield, Newberry, Saluda, Greenwood, Lexington, Richland, Sumter, Florence, Marion, Dillon, Horry.
- District 3:** Aiken, Edgefield, McCormick, Abbeville, Anderson, Oconee, Pickens, Greenville, Spartanburg, Union, Chester, Lancaster, Chesterfield, Marlboro, Darlington, Lee, Kershaw, Fairfield, Newberry, Saluda, Greenwood, Lexington, Richland, Sumter, Florence, Marion, Dillon, Horry.
- District 4:** Aiken, Edgefield, McCormick, Abbeville, Anderson, Oconee, Pickens, Greenville, Spartanburg, Union, Chester, Lancaster, Chesterfield, Marlboro, Darlington, Lee, Kershaw, Fairfield, Newberry, Saluda, Greenwood, Lexington, Richland, Sumter, Florence, Marion, Dillon, Horry.
- District 5:** Aiken, Edgefield, McCormick, Abbeville, Anderson, Oconee, Pickens, Greenville, Spartanburg, Union, Chester, Lancaster, Chesterfield, Marlboro, Darlington, Lee, Kershaw, Fairfield, Newberry, Saluda, Greenwood, Lexington, Richland, Sumter, Florence, Marion, Dillon, Horry.
- District 6:** Aiken, Edgefield, McCormick, Abbeville, Anderson, Oconee, Pickens, Greenville, Spartanburg, Union, Chester, Lancaster, Chesterfield, Marlboro, Darlington, Lee, Kershaw, Fairfield, Newberry, Saluda, Greenwood, Lexington, Richland, Sumter, Florence, Marion, Dillon, Horry.

*Congressional
Districts*
OF SOUTH CAROLINA

Representatives (cont.)

Floyd Spence (R)
2427 Rayburn House Office Building
Washington, D.C. 20515
(202) 225-2452
(2nd District)

Congressman Spence was first elected to the U.S. House of Representatives in 1970. He is the ranking minority member of the Standards of Official Conduct Committee and a member of the Armed Services Committee.

Butler Derrick (D)
133 Cannon House Office Building
Washington, D.C. 20515
(202) 225-5301
(3rd District)

Congressman Derrick began service in the U.S. House of Representatives in 1974. He is a member of the Rules and Aging Committees.

Carroll A. Campbell, Jr. (R)
408 Cannon House Office Building
Washington, D.C. 20515
(202) 225-6030
(4th District)

Congressman Campbell was first elected to the U.S. House of Representatives in 1978. He is a member of the Appropriations Committee.

Ken Holland (D)
2431 Rayburn House Office Building
Washington, D.C. 20515
(202) 225-5501
(5th District)

Congressman Holland was first elected to the U.S. House of Representatives in 1974. He is a member of the Ways and Means and Standards of Official Conduct Committees.

John Light Napier (R)
1631 Longworth House Office Building
Washington, D.C. 20515
(202) 225-3315
(6th District)

Congressman Napier was first elected to the U.S. House of Representatives in 1980; He is the Assistant Republican Whip and a member of the Agriculture Committee.

4.3 State Government

The Constitution of South Carolina establishes three branches within the state government: executive, legislative, and judicial, which "shall be forever separate and distinct from each other" (Article I, Section 8). The following text describes the structure and jurisdiction of South Carolina's government.

4.3.1 Executive Branch

South Carolina's executive branch comprises 23 departments and elected officers: Governor, Lieutenant Governor, Secretary of State, Adjutant General, Comptroller General, Department of Agriculture, Department of Archives and History, Department of Consumer Affairs, Department of Corrections, Department of Education, Department of Health and Environmental Control, Department of Highways and Public Transportation, Department of Insurance, Department of Juvenile Placement and Aftercare, Labor Department, Department of Mental Health, Department of Mental Retardation, Department of Parks, Recreation and Tourism, Department of Social Services, Department of Veteran's Affairs, Vocational Rehabilitation Department, and Wildlife and Marine Resources Department.

Office of the Governor

The Governor of South Carolina is Richard Wilson Riley, a Democrat from Greenville. South Carolina's Governor is elected to a four-year term and may serve no more than two consecutive terms in office. The supreme executive authority of the state is vested in the Governor. He is empowered to recommend legislation to the General Assembly, convene the General Assembly, issue reports to the General Assembly, grant reprieves and commutations, appoint the members of boards and commissions, and exercise both the full and item veto. He may also require information in writing from the head of any agency or department pertaining to the duties of his/her office. The Governor serves as Chairman of the Budget and Control Board. Governor Riley also serves as Chairman of the State Planning Council on Radioactive Waste Management. The Governor's address, his principal staff members, and his Washington office address follow.

Governor Richard Riley
State House
P.O. Box 11450
Columbia, South Carolina 29211
(803) 758-3208

Governor's principal staff members:

Executive Assistant: Donald R. Hinson (758-3208)
Executive Assistant, Legislative Affairs: Dwight Drake (758-7115)
Deputy Assistant, Legislative Affairs: Willie E. DeLoach (758-7115)
Executive Assistant, Legal Affairs: Dorothy A. Manigault (758-7115)
Executive Assistant, Education, Health and Human Services:
Milton Kimpson (758-7115)
Executive Assistant, Management and Finance: Katherine M. Clarke
(758-3208)
Executive Assistant, Energy, Natural Resources and Economic
Development: David Reed (758-7115)
Press Secretary: William Russell McKinney (758-7911)
Appointments Secretary: Gail Silver (758-3208)

Washington Office:

South Carolina State Office
444 N. Capital Street
Washington, D.C.
(202) 624-5300
Director - Steve B. Farber

Department of Health and Environmental Control

The Department of Health and Environmental Control comprises five offices: The Office of Environmental Quality administers programs pertaining to wastewater and stream quality control, solid waste management, air quality control, facilities evaluation, and environmental monitoring. The Office of Health Protection contains the Bureau of Radiological Health. The Commissioner of the Department is:

Robert S. Jackson, M.D.
2600 Bull Street
Columbia, South Carolina 29201
(803) 758-5443

Bureau of Radiological Health. Contained within the Department of Health and Environmental Quality's Office of Health Protection is the Bureau of Radiological Health. Most state authority governing the installation, use, handling, transportation, and storage of radioactive materials has been concentrated within the Bureau.

The Bureau is empowered to:

- o Develop and conduct programs for the evaluation of radiation sources;
- o Develop programs for the control, regulation, and surveillance of radiation sources;
- o Adopt, promulgate, repeal, and amend regulations pertaining to the control of sources of radiation;
- o Advise and consult with the Governor, General Assembly, and federal, state and interstate agencies regarding radiation control;
- o Encourage, participate in, and conduct studies, research, and investigations pertaining to radiation control;
- o Collect and disseminate information pertaining to radiation control; and
- o Adopt and promulgate rules and regulations governing the transportation of radioactive materials within South Carolina.

The Chief of the Bureau of Radiological Health is:

Heyward G. Shealy
2600 Bull Street
Columbia, South Carolina 29201
(803) 758-5548

Technical Advisory Radiation Control Council

The Technical Advisory Radiation Control Council comprises six members appointed by the Governor for terms of three years. The Council advises the Department of Health and Environmental Control on matters pertaining to ionizing radiation. No standards, rules, or regulations may be promulgated, adopted, modified, or repealed by the Department unless they have been approved by the Council. The Chairman is:

U. Hoyt Bodie, M.D.
2600 Bull Street
Columbia, South Carolina 29201
(803) 758-5548

Board of Health and Environmental Control

The Board of Health and Environmental Control comprises seven members appointed by the Governor, with the advice and consent of the Senate, to four-year terms. The Board supervises the administration of the Department of Health and Environmental Control. It also serves in an advisory capacity to municipal and county health authorities. The Chairman is:

William M. Wilson
2600 Bull Street
Columbia, South Carolina 29201
(803) 758-5443

Governor's Nuclear Advisory Council

The Governor's Nuclear Advisory Council was created in 1980. It provides advise to the Governor on issues involving the use, handling, management, transportation, storage, or disposal of nuclear materials within South Carolina. It also advises the Governor on federal programs relating to the establishment of a National Radioactive Waste Management Plan and the applicability of South Carolina statutes and regulations to such planning. The Council comprises five members appointed by the Governor. The Chairman is:

Brown Johnson
P.O. Box 1865
Florence, South Carolina 29503

State Development Board

The State Development Board comprises 19 members appointed by the Governor, with the advise and consent of the Senate, to five-year terms. The Board is responsible for promoting and developing atomic energy resources in South Carolina. It is empowered to:

- o Promote the establishment of private atomic energy facilities such as reprocessing plants, disposal sites, and transportation facilities;
- o Advise the Governor and General Assembly on the development and promotion of atomic energy resources;

- o Coordinate atomic energy development within the state;
- o Serve as a liaison between South Carolina and industry, the federal government, and other states;
- o Consult and cooperate with South Carolina's university system for the promotion of atomic energy development.

The Chairman is:

Max Heller
 1301 Gervais Street
 Box 927
 Columbia, South Carolina 29202
 (803) 758-3145

State Budget and Control Board

The State Budget and Control Board comprises five ex officio members: the Governor, who serves as Chairman, State Treasurer, Comptroller General, Chairman of the Senate Finance Committee, and Chairman of the House Ways and Means Committee. The Board has custody over all state property and is empowered to:

- o Expend state funds to acquire and develop land and facilities the Board believes will foster the development of the state's economic potential in the energy field;
- o Lease, sublease, or sell real or personal property to public or private interests; and
- o Enter into agreements with the federal government to assume perpetual maintenance of lands donated, leased, or purchased from the federal government and used for the development of atomic energy resources or as a custodial site for radioactive materials.

The Board may be contacted at:

Office of the Governor
 State House
 P.O. Box 11450
 Columbia, South Carolina 29211
 (803) 758-3208

Office of Energy Resources

The Office of Energy Resources implements and administers state and federal conservation programs, acts as a state clearinghouse for energy programs and actions affecting energy sources, implements educational programs on energy use, and encourages energy research. The Director is:

B. Kelly Smith
1122 Lady Street
Suite 1130
Columbia, South Carolina 29201
(803) 758-7502

South Carolina Water Resources Commission

The South Carolina Water Resources Commission comprises 18 members.

The Commission is empowered to:

- o Advise and assist the Governor and the General Assembly on the formulation of a comprehensive water resources policy for the state;
- o Develop and establish policies for water resource use and control;
- o Review the actions and policies of state agencies with water resource responsibility; and
- o Review federal programs affecting the use or control of South Carolina's waters.

The Executive Director is:

Clair B. Guess, Jr.
Box 4515
3830 Forest Drive
Columbia, South Carolina 29240
(803) 758-2514

South Carolina Coastal Council

The South Carolina Coastal Council was established to develop and implement a comprehensive coastal zone management program. It comprises 18 members.

The Chairman is:

Sen. James M. Waddell, Jr.
1116 Bankers Trust Tower
Columbia, South Carolina 29201
(803) 758-8442

State Land Resources Conservation Commission

The State Land Resources Conservation Commission comprises five members appointed by the Governor to terms of four years. It provides technical assistance to South Carolina's 46 conservation districts. The Executive Director is:

John W. Parris
2221 Devine Street
Suite 222
Columbia, South Carolina 29205
(803) 758-2823

Southern States Energy Board

The Southern States Energy Board was founded in 1961 as the Southern Interstate Nuclear Board. It serves the states of Texas, Georgia, South Carolina, Louisiana, Tennessee, North Carolina, Oklahoma, Alabama, Arkansas, Kentucky, Florida, Mississippi, West Virginia, Virginia, Maryland, Missouri, and the Commonwealth of Puerto Rico with technical assistance, program development, policy analysis, and research support. The activities of the Board staff are supervised by a Board of Directors composed of one member per state appointed by the Governor. In addition, the Southern States Energy Board has a Legislative Policy Advisory Council which consists of those state legislators serving on the Southern Legislative Conference Energy Committee. South Carolina's seat on the Board of Directors is held by:

B. Kelly Smith
Office of Energy Resources
1122 Lady Street
Suite 1130
Columbia, South Carolina 29201
(803) 758-7502

4.3.2 Legislative Branch

South Carolina's General Assembly consists of a Senate, which has 46 members, and a House of Representatives, which has 124 members. Senate members are elected to four-year terms; House members are elected to two-year terms.

The General Assembly convenes annually on the second Tuesday in January. The 104th General Assembly convened on January 13, 1981. It usually meets on Tuesdays, Wednesdays, and Thursdays of the weeks that it is in session. Session length is not governed by law.

Senate

The South Carolina Senate consists of 46 members: 41 Democrats and 5 Republicans. The Senate members of the 104th General Assembly are:

W. Paul Cantrell, Jr., D	Thomas L. Moore, D
A. Eugene Carmichael, Jr., D	Elizabeth J. Patterson, D
Harry A. Chapman, Jr., D	Harvey S. Peeler, Jr., D
Rembert C. Dennis, D	Coleman G. Poag, D
William W. Doar, Jr., D	Arthur Ravenel, Jr., R
John Drummond, D	Jeff R. Richardson, Jr., R
Ralph H. Ellis, D	Hyman Rubin, D
T. Ed Garrison, D	Don Stanley Rushing, D
L. Marion Gressette, D	Norma C. Russell, R
Donald H. Holland, D	Edward E. Saleeby, D
Robert C. Lake, Jr., D	Alex Sanders, D
John C. Land, III, D	Nikki G. Setzler, D
Hugh K. Leatherman, Sr., D	Ryan C. Shealy, R
Phil P. Leventis, D	Harris P. Smith, D
John C. Lindsay, D	Horace C. Smith, D
Isadore E. Lourie, D	J. Verne Smith, D
Alexander S. Macaulay, D	Thomas E. Smith, Jr., D
John A. Martin, D	David S. Taylor, D
Glenn F. McConnell, R	Nick A. Theodore, D
Heyward E. McDonald, D	David E. Turnipseed, D
M.E. McDonald, D	James M. Waddell, Jr., D
Frank H. McGill, D	Marshall B. Williams, D
Peden B. Mcleod, D	Thomas Dewey Wise, D

Senate Leadership. The presiding officer of the Senate is the Lieutenant Governor, who serves as President of the Senate. The President presides over the Senate and appoints Senate members of conference and interim committees. He may

Map 4.2
4-12

cast no vote except upon equal division of the House. In the absence of the President, the President pro Tempore presides over the Senate. He is elected by the members of the Senate. The officers of the Senate are:

President: Nancy Stevenson (Lieutenant Governor)
President pro Tempore: L. Marion Gressette (D, St. Matthews)
Majority Leader: L. Marion Gressette (D, St. Matthews)
Minority Leader: Jeff Richardson, Jr. (R, Greenville)

Committee Structure. There are 15 Senate Standing Committees in the 104th General Assembly of South Carolina. Committee Chairmen and members are elected by the Senate. Relevant Standing Committees are:

Agriculture and Natural Resources

Chairman: T. Ed Garrison (D, Anderson)

Finance

Chairman: Rembert C. Dennis (D, Moncks Corner)

Interstate Cooperation

Chairman: L. Marion Gressette (D, St. Matthews)

Transportation

Chairman: John C. Lindsay (D, Bennettsville)

House of Representatives

The South Carolina House of Representatives consists of 124 members, 107 Democrats and 17 Republicans. The House members of the 104th General Assembly of South Carolina are:

R. Linwood Altman, D	W. Sterling Anderson, D
Joseph F. Anderson, Jr., D	William E. Applegate, D
Francis X. Archibald, D	Robert L. Helmly, D
James M. Arthur, D	B.L. Hendricks, Jr., D
Warren D. Arthur, IV, D	Lloyd I. Hendricks, D
James N. Ashe, Sr., D	Caldwell T. Hinson, D
D.L. Aydlette, Jr., R	Charles E. Hodges, D
Hudson L. Barksdale, D	D.N. Holt, Jr., D
David M. Beasley, D	Ben F. Hornsby, D
Dill Blackwell, D	S. Hunter Howard, Jr., D

Map 4.3

South Carolina House members (continued)

Larry Blanding, D	Beattie E. Huff, D
Solomon Blatt, D	Thomas E. Huff, D
John D. Bradley, III, R	Thomas L. Hughston, Jr., D
Philip T. Bradley, R	Isaac C. Joe, D
James T. Brandt, D	William H. Jones, D
William S. Branton, Jr., D	Harriet H. Keyserling, D
Thomas D. Broadwater, D	James E. Kinard, Jr., D
Danny M. Bruce, D	Herbert Kirsh, D
Archibald H. Buchan, D	Jarvis R. Klapman, R
Danny E. Bundrick, D	Robert A. Kohn, R
T. Moffatt Burriss, R	Larry L. Koon, R
M. Judson Busbee, D	Edwin S. Lake, D
Bill Campbell, D	W. Richard Lee, D
Marion P. Carnell, D	Tom G. Mangum, D
C.D. Chamblee, D	Sam P. Manning, D
Duke Cleveland, D	Thomas M. Marchant, III, R
Ron L. Cobb, D	Larry A. Martin, D
M.J. Cooper, D	John W. Matthews, Jr., D
Virginia L. Crocker, D	Jennings G. McAbee, D
Clyde M. Dangerfield, D	D.M. McEachin, Jr., D
Michael R. Daniel, D	David F. McInnis, D
Gene W. Dukes, D	John D. McInnis, Jr., D
Billy L. Eaddy, D	Woodrow M. McKay, D
M. Lois Eargle, D	Robert Neil McLellan, D
T.W. Edwards, Jr., D	John W. McLeod, D
Tom J. Ervin, D	Douglas E. McTeer, Jr., D
Parker Evatt, R	Jean B. Meyers, D
John G. Felder, D	Earl M. Middleton, D
Samuel R. Foster, D	Theo W. Mitchell, D
Palmer Freeman, Jr., D	Julius Murray, D
Tobias Gadson, Sr., D	Melvin Ernest Nunnery, D
John P. Gardner, Jr., D	Derrial L. Ogburn, D
Larry E. Gentry, D	Kay Patterson, D
James E. Gonzalas, R	Lewis Phillips, D
B.J. Gordon, Jr., D	Olin R. Phillips, D
Herbert C. Granger, D	Chris Pracht, D
J. Wilton Graves, D	J. Leon Rampey, D
Jackson V. Gregory, D	A. Victor Rawl, D
Charles L. Griffin, III, D	Julian A. Reynolds, D
Michael S. Gulledege, D	Richard L. Rigdon, D
Archie Hardy, R	John I. Rogers, III, D
Jean Laney Harris, D	Irene K. Rudnick, D
Patrick B. Harris, D	Ramon, Schwartz, Jr., D
C. Alexander Harvin, III, D	Robert J. Sheheen, D
David O. Hawkins, D	Dalton Sheppard, Jr., D
John C. Hayes, III, D	Edward W. Simpson, Jr., R
Joyce C. Hearn, R	John J. Snow, Jr., D
Eugene C. Stoddard, D	Marc H. Westbrook, D
Robert M. Tallon, Jr., D	Juanita M. White, D
Jean Hoefer Toal, D	David H. Wilkins, R
Dave C. Waldrop, Jr., D	Daniel E. Winstead, R
McKinley Washington, Jr., D	Robert R. Woods, D

House Leadership. The presiding officer of the House is the Speaker, who is elected by the members of the House. He appoints all committee members and may vote on all matters before the House. In the Speaker's absence, the Speaker Pro Tempore presides over the House. The officers of the House of Representatives are:

Speaker: Ramon Schwartz, Jr. (D, Sumter)
Speaker pro Tempore: Michael R. Daniel (D, Gaffney)
Majority Leader: Charles E. Hodges (D, Loris)
Minority Leader: T. Moffatt Burriss (R, Columbia)

Committee Structure. There are 10 House standing committees in the 104th General Assembly of South Carolina. Committee members are appointed by the Speaker and chairmen are elected by the members of each respective committee. Relevant House Standing Committees are:

Agriculture and Natural Resources

Chairman: John J. Snow, Jr. (D, Hemingway)
Vice Chairmen: Larry L. Koon (R, Lexington)
Woodrow W. McKay (D, Timmonsville)

Judicial, Military, Public and Municipal Affairs

Chairman: B.L. Hendricks, Jr. (D, Columbia)
Vice Chairmen: Robert L. Helmly (D, Moncks Corner)
Parker Evatt (R, Columbia)
Jean B. Meyers (D, Myrtle Beach)

Ways and Means

Chairman: Tom G. Mangum (D, Lancaster)
Vice Chairmen: T.W. Edwards, Jr. (D, Spartanburg)
Marion P. Carnell (D, Ware Shoals)
Patrick B. Harris (D, Anderson)

Legislative Council

The Legislative Council consists of the President of the Senate, Speaker of the House, Secretary of State, Chairman of the Senate Judiciary Committee, and Chairman of the House Judiciary Committee. The Council is responsible for the organization and operation of research, reference, and bill drafting services.

4.3.3 Judicial Branch

South Carolina's judicial power is vested in "a unified judicial system, which shall include a Supreme Court, a Circuit Court, and such other courts of uniform jurisdiction as may be provided for by general law" (Article V, Section I).

Supreme Court

South Carolina's Supreme Court is the highest court of the state. It comprises a Chief Justice and four Associate Justices, who are elected by the General Assembly to 10-year terms. The Supreme Court hears appeals from the state Circuit and Family Courts.

Circuit Court

The Circuit Court is the general trial court in South Carolina. There are 16 judicial circuits within the state and each circuit has one or more judges elected by the General Assembly to six-year terms. The Circuit Court has original jurisdiction over all criminal and civil cases. When necessary, the General Assembly may provide for additional Circuit Court Judges to be administered by the Chief Justice of the Supreme Court.

Family Courts

The Family Court system was established in 1976 and consists of one court in each of South Carolina's 16 judicial circuits. Family Court Judges are elected by the General Assembly to terms of four years. The Court has exclusive jurisdiction over all domestic relations and juvenile matters. The Chief Justice of the Supreme Court designates one judge from each circuit as Chief Family Court Judge. All appeals from the Family Courts are heard by the Supreme Court.

Probate Courts

Each county in South Carolina maintains a Probate Court. Probate Courts have original jurisdiction in all matters pertaining to wills and the administration of estates and in all cases of mental incompetency. Probate Court Judges are elected by popular vote to four-year terms.

Municipal Courts

Cities with a population of 1,000 or more may establish a Municipal Court. Municipal Courts have jurisdiction in criminal matters that involve offenses against municipal ordinances. The Courts are presided over by Recorders who are elected by the Mayor and the Board of Aldermen.

Magistrates Courts

There are approximately 330 Magistrates Courts in South Carolina. Each Magistrate is appointed by the Governor for a term of two to four years, depending upon the county in which the court is located. The territorial, criminal, and civil jurisdiction of the Magistrates Courts vary from county to county and within counties.

4.3.4 Relevant Statutes and Regulations

This section summarizes South Carolina statutes and regulations that may be relevant to low-level radioactive waste management. The full text or pertinent sections of all statutes and regulations cited in this section is contained in the appendices.

Atomic Energy and Radiation Control Act

The Atomic Energy and Radiation Control Act designated the Department of Health and Environmental Control as the state agency with primary responsibility for the regulation and control of radiation sources. It also outlined the powers and duties of the State Development Board and the Budget and Control Board with respect to the atomic energy field. Furthermore, the Act established the Technical Advisory Radiation Control Council and authorized the Governor "to enter into agreements with the Federal Government providing for discontinuance of certain of the Federal Government's activities with respect to radiation sources and the assumption thereof by the State toward the end of instituting and maintaining a regulatory program compatible with the standards and regulatory programs of the Federal Government and consonant insofar as possible with those of other states."

South Carolina Radioactive Waste Transportation and Disposal Act

The South Carolina Radioactive Waste Transportation and Disposal Act amended the Atomic Energy and Radiation Protection Act by providing for control of the transportation of radioactive waste into and within the State of South Carolina.

Regulations for Radioactive Materials

The South Carolina Department of Health and Environmental Control has promulgated regulations for radioactive materials pursuant to the provisions of the South Carolina Atomic Energy and Radiation Control Act. These regulations apply to all persons who receive, possess, use, transfer, or acquire radioactive materials and who are not subject to regulation by the U.S. Nuclear Regulatory Commission. Contained within the regulations are standards for protection against radiation, requirements for the licensing of radioactive materials, requirements for industrial radiographic operations, and standards for the use of sealed sources of radiation in the health professions.

Interim Regulations for the Transportation of Radioactive Materials Into or Within South Carolina

Interim regulations for the transportation of radioactive materials into or within South Carolina were approved by the Board of Health and Environmental Control on May 26, 1980. These regulations apply to all persons who ship or transport radioactive waste into or within the state. They contain provisions for bonds and permits, routes, prior notification, and certification.

Hazardous Waste Management Regulations

The South Carolina Department of Health and Environmental Control has promulgated regulations for hazardous waste management. Radioactive materials, however, do not fall under the jurisdiction of these regulations.

4.4 Federal Activities

There are two operating commercial power reactors in South Carolina, Duke Power and Carolina Power and Light. Both of these facilities are licensed by the U.S. Nuclear Regulatory Commission. The U.S. Department of Energy (DOE) operates four research and development and field facilities within the state: Savannah River Operations Office, Savannah River Ecology Laboratory, Savannah River Laboratory, and Savannah River Plant. The Savannah River Operations Office is a major installation in DOE's nuclear materials production and research program. The Savannah River Laboratory, operated by E. I. DuPont de Nemours and Company, provides developmental and technical assistance in all facets of the nuclear fuel cycle. The Savannah River Plant, also operated by E. I. DuPont de Nemours and Company, conducts research on fuel and target fabrication, isotope production in nuclear reactors, chemical separations, waste management, and heavy-water extraction. The Savannah River Ecology Laboratory is a research facility dedicated to studying thermal energy, mineral cycling, the radioecology of transuranics, and basic and theoretical ecology.

4.5 Interest Groups

This section identifies those parties that either have expressed or may have an interest in issues surrounding low-level radioactive waste management. Included are the names, special concerns, and descriptions of interested parties within South Carolina.

Palmetto Alliance

Palmetto Alliance is a nonprofit organization that promotes the use of safe, renewable, non-nuclear energy forms. The Alliance has been involved in a continuing program to educate and organize against the nuclear industry. It

maintains nine chapters in South Carolina. The Director is Michael Lowe.

Palmetto Alliance
2135 1/2 Devine Street
Columbia, South Carolina 29205
(803) 254-8132

South Carolina Environmental Coalition

The South Carolina Environmental Coalition is composed of both individual and organizational members. It is concerned with environmental issues affecting South Carolina. The Coalition publishes a quarterly journal, Coalition. The Executive Director is William Frye.

South Carolina Environmental Coalition
P.O. Box 5761
Columbia, South Carolina 29250
(803) 799-0321

League of Women Voters of South Carolina

The League of Women Voters is a membership organization involved in both energy and environmental quality programs. The concerns of the League regarding radioactive waste are outlined in the League's "Criteria for Evaluating Suitability of Storage and Disposal Sites for Hazardous and Nuclear (Including Low-Level Radioactive) Waste." The criteria proposes a decision making process which allows for public participation, participation and review by all government levels, and procedures for mediation of intergovernmental conflict. It also states that storage or disposal of radioactive waste should not occur on or near drinking water supply sources, fragile land areas, areas with significant renewable resource value or areas where there are rare or valuable ecosystems or geological formations.

The League's Energy Chairwomen is:

Dr. Mary Kelly
2838 Devine Street
Columbia, South Carolina 29205
(803) 771-0063

Environmentalists Inc.

Environmentalists Inc. is an organization composed of professionals, such as physicists and engineers, who are concerned with the protection of the environment, problems associated with energy use, and potential hazards of radiation. It maintains one of the largest collections of nuclear-related documents in the country.

Environmentalist, Inc.
C/o Ruth Thomas
1339 Sinkler Road
Columbia, South Carolina 29205
(803) 182-3000

Sierra Club

The Sierra Club is an environmental organization concerned with the protection of natural resources and the maintenance of a clean environment. The Director of the South Carolina Chapter is:

Edmund J. Scott
139 Sylvan Way
Greenville, South Carolina 29605
(803) 235-3377

Audubon Society

The Southeast Regional Office of the National Audubon Society is located in Charleston, South Carolina. All inquiries or information concerning the Audubon Society in South Carolina should be directed to this office. The Director is Carlyle Blakeney.

Southeast Regional Office
National Audubon Society
P.O. Box 1268
Charleston, South Carolina 29402
(803) 723-6171

Other Possible Interested Parties

Aiken Environmental Coalition
P.O. Box 1415
Aiken, South Carolina 29801
(803) 648-9806

Municipal Association of South Carolina
1213 Lady Street
P.O. Box 11558
Columbia, South Carolina 29211
(803) 799-9574

People for a Clean Environment
522 Isaquena Trail
Clemson, South Carolina 29631

South Carolina Association of Counties
1817 Hampton Street
Columbia, South Carolina 29201
(803) 252-7255

American Civil Liberties Union
C/o Tom McAbby
Clear Towers, Apartment K
Columbia, South Carolina
(803) 799-6309

Midlands Natural Food Growers
C/o Kenneth Kamis
3005 Blossom Street
Columbia, South Carolina 29205

Fairlawn Community Association
C/o Mrs. Idora K. Brown
Route 5, Box 182
Coon Store Road
Columbia, South Carolina 29203

Friends United For Safe Energy
C/o Acorn Natural Foods
3715 East North Street
Greenville, South Carolina 29615
(803) 244-3709
Fairfield Association
C/o Robert Guild
1314 Pall Mall Street
Columbia, South Carolina 29201
(803) 252-0929

Dr. Richard Keamy
University of South Carolina
Columbia, South Carolina 29208
(803) 777-6801

Dr. Ronald P. Wilder
University of South Carolina
Columbia, South Carolina 29208
(803) 777-6955

Richard Schartz
909 King Street
Columbia, South Carolina
(803) 799-1589

W. Elmer Allison
Route 4, P.O. Box 391
Columbia, South Carolina 29204
(803) 776-8890

4.6 Printed Media

A selection of newspaper articles relevant to low-level radioactive waste management that have been published in South Carolina's newspapers during the past several years is in the appendices.

A survey package was developed to solicit data and information necessary to characterize generally the low-level radioactive waste management practices in the State of South Carolina. The package included a questionnaire and appropriate letters encouraging licensees to participate in the survey. Administration of the survey was carefully planned to allow licensees adequate response time and included procedures for handling inquiries concerning the data requested and for performing selected follow-up telephone calls. The following sections provide specific information relative to the survey form and administration of the survey.

5.1 Survey Form

The survey form was designed to present the data requested in a concise, easily understood, yet comprehensive format. The intent was to request sufficient data to ascertain both the qualitative and quantitative nature of low-level radioactive waste management practices. The Form was designed to allow "check-off" answers wherever possible and to minimize the effort required by respondents in supplying the requested data.

The survey form proper consists of six 14 x 8 1/2 inch typeset printed sheets (three sheets, front and back), as shown in Figure 5.1. Licensees were informed that the data would be treated as CONFIDENTIAL and would be ANONYMOUSLY reported in consensus and statistical form. Each licensee was assigned a number, stamped on each sheet of the questionnaire. The first two digits identify the state and the last four the licensee. These identifying numbers were used during data processing for control purposes.

Sheet One of the questionnaire contains introductory statements consisting of a Rationale for Study and General Guidelines for completing the form. The first four sections, also a part of sheet one, request the following information:

- 1.0 Organization and Facility Data
- 2.0 Type of Facility
- 3.0 License Information
- 4.0 Radioactive Waste Information

Section 4.0 asks a simple yes or no question about whether the facility generated and/or received radioactive waste during 1978, 1979 and/or 1980. Respondents answering NO for each year were informed that they had completed the questionnaire and were asked to return it.

Sheet Two consists of Section 5.0, Use Classification for Unsealed Radioactive Sources, and Yearly Data Sheet Instructions. The instructions require the use of a key for completing the yearly data sheets. The key contains multiple answers to certain questions and the respondent had only to select the appropriate corresponding number.

The Yearly Data Sheets for 1978, 1979, and 1980 comprise sheets Three through Five. These sheets solicit data in matrix format of radionuclides versus characteristic and quantitative data in six (6) general categories. The categories are the same for each Yearly Data Sheet, except they were sequentially numbered from 6.0 through 23.0 for processing purposes. The categories are:

- 6.0, 12.0, 18.0 Radionuclides Received/Produced
- 7.0, 13.0, 19.0 Radioactive Waste Generated

- 8.0, 14.0, 20.0 Radioactive Waste Received
- 9.0, 15.0, 21.0 Radioactive Waste Processed/Reduced
- 10.0, 16.0, 22.0 Radioactive Waste Shipped
- 11.0, 17.0, 23.0 On Site Waste Disposal

Sheet Six contains Sections 24.0 and 25.0, which inquire about the source(s) of radionuclide production and facility(ies) from which radioactive waste was received, and a comments and remarks section. This section allows the recipient of the survey to make suggestions or indicate any difficulties encountered that may have effected a particular response.

Some requests for information are included as part of the questionnaire for the sole purpose of determining the validity of other data collected. For example, the type of monitoring instrumentation that a respondent uses to collect activity data reveals the accuracy with which the data was obtained.

5.2 Survey Administration

Mailout packages were prepared that included a questionnaire, a self-addressed prepaid return envelope, a letter from Vachon, Nix and Associates, and a letter from Mr. Heyward G. Shealy, Chief, Bureau of Radiological Health, South Carolina Department of Health and Environmental Control. The Vachon, Nix and Associates letter and state letter included in the packages are presented as Figures 5.2 and 5.3.

Names and addresses of those licensed to handle radioactive material in the State of South Carolina were obtained from EG&G Idaho, Inc. EG&G provided a list of U.S. Nuclear Regulatory Commission licensees. No attempt was made to differentiate between those licensees believed not to

generate radioactive waste and those known to generate waste. Survey packages were mailed to every name provided.

Large 7 1/2 x 10 1/2 inch envelopes were specifically used for the mailout so that the package would not be easily misplaced by recipients. Two special notices were printed on the envelopes: 1) DATED MATERIAL: Southern States Energy Board Radioactive Waste Management Survey, and 2) ATTN: Radioactive Material Control Officer.

The packages were mailed first class on April 23, 1981, and a sample package was subsequently mailed to Mr. Shealy. Figure 5.4 is the letter of transmittal to him. After approximately two weeks had elapsed, follow-up telephone calls were made to selected licensees. Figure 5.5 is a copy of a standard form that was developed to record inquiries from licensees as well as follow-up contacts.

June 15th was established as a cut-off date for processing questionnaires. Questionnaires received after that date were monitored for the purpose of sorting out significant "waste generators." The results of the survey are presented in Chapter 6.

Figure 5.1

PAGE 1 OF 6	LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT SURVEY	01 0250																																										
<p style="text-align: center;">RATIONALE FOR STUDY</p> <p>The purpose of this survey is to compile data on the generation, handling, and disposal of low-level radioactive waste in your State. The compilation of these data will serve as a basis to analyze the time-rate-of-change of low-level radioactive waste generation and further assist in the development of sound policies and programs for low-level radioactive waste management. Each survey form will be coded by respondent. The data are CONFIDENTIAL and will be reported in consensus and statistical form.</p> <p style="text-align: center;">GENERAL GUIDELINES</p> <p>Please provide the requested information accurately and as complete as possible with typewriter, pen or pencil.</p> <p>When a request for information does not apply to your facility, leave blank and continue to the next request.</p> <p>When the selections provided for certain sections do not fit your situation, use the selection entitled other and specify in the space provided.</p> <p>Once you have completed this questionnaire, please return it in the enclosed stamped, self-addressed envelope. Thank you.</p>	<div style="text-align: center;"> <p>VACHON, NIX & ASSOCIATES P.O. Box 1385 Norcross, Georgia 30071 404/448-5235</p> </div> <p style="text-align: center;">2.0 TYPE OF FACILITY</p> <p>Please check the block(s) which represents your major operation(s) but not more than one per group.</p> <p>2.1 Medical</p> <p>2.1.1 ☐ Hospital</p> <p>2.1.2 ☐ Medical School (Research/Testing Lab)</p> <p>2.1.3 ☐ Nursing/Convalescent Home</p> <p>2.1.4 ☐ Physician</p> <p>2.1.5 ☐ Clinic</p> <p>2.1.6 ☐ Other _____</p> <p>2.2 Educational</p> <p>2.2.1 ☐ University/College</p> <p>2.2.2 ☐ Technical/Community College</p> <p>2.2.3 ☐ High School</p> <p>2.2.4 ☐ Other _____</p> <p>2.3 Industrial</p> <p>2.3.1 ☐ Manufacturing</p> <p>2.3.2 ☐ Construction</p> <p>2.3.3 ☐ Mining</p> <p>2.3.4 ☐ Well Logging/Seismology/ Oil-Gas Exploration</p> <p>2.3.5 ☐ Engineering</p> <p>2.3.6 ☐ Research & Development</p> <p>2.3.7 ☐ Pharmaceutical Manuf.</p> <p>2.3.8 ☐ Other _____</p> <p>2.4 Critical Nuclear Reactor</p> <p>2.4.1 ☐ Commercial Power Reactor</p> <p>2.4.2 ☐ Research Reactor</p> <p>2.5 Federal Government</p> <p>2.5.1 ☐ Military</p> <p>2.5.2 ☐ Non-Military</p> <p>2.6 State Government</p> <p>2.6.1 ☐ Highway Department</p> <p>2.6.2 ☐ State Health Department</p> <p>2.6.3 ☐ Other _____</p> <p>2.7 Other Jurisdictions</p> <p>2.7.1 ☐ County</p> <p>2.7.2 ☐ City</p>	<p style="text-align: center;">3.0 LICENSE INFORMATION</p> <p>Please provide information on licenses issued by the N Regulatory Commission and/or State Agencies.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">3.1 License Number</th> <th style="width: 33%;">3.2 Issuing Agency</th> <th style="width: 34%;">3.3 Classification</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> <p style="text-align: center;">4.0 RADIOACTIVE WASTE INFORMATION</p> <p>4.1 Did your facility generate radioactive waste during 1978, and/or 1980 that required holding, reprocessing, or disposal or shipment to an off-site disposal facility?</p> <table style="width: 100%;"> <tr> <td>1978</td> <td>☐ Yes</td> <td>☐ No</td> </tr> <tr> <td>1979</td> <td>☐ Yes</td> <td>☐ No</td> </tr> <tr> <td>1980</td> <td>☐ Yes</td> <td>☐ No</td> </tr> </table> <p>4.2 Did your facility receive radioactive waste from a organization, a branch of your organization, or another organization for holding, reprocessing, on-site disposal or shipment to an off-site disposal facility during 1978, 1979 and/or 1980?</p> <table style="width: 100%;"> <tr> <td>1978</td> <td>☐ Yes</td> <td>☐ No</td> </tr> <tr> <td>1979</td> <td>☐ Yes</td> <td>☐ No</td> </tr> <tr> <td>1980</td> <td>☐ Yes</td> <td>☐ No</td> </tr> </table> <p>If your facility did not generate and/or receive radioactive waste during 1978, 1979 or 1980, then you have completed this questionnaire. Thank you. If you answered yes to and/or 4.2, please complete the form.</p>	3.1 License Number	3.2 Issuing Agency	3.3 Classification																						1978	☐ Yes	☐ No	1979	☐ Yes	☐ No	1980	☐ Yes	☐ No	1978	☐ Yes	☐ No	1979	☐ Yes	☐ No	1980	☐ Yes	☐ No
3.1 License Number	3.2 Issuing Agency	3.3 Classification																																										
1978	☐ Yes	☐ No																																										
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1978	☐ Yes	☐ No																																										
1979	☐ Yes	☐ No																																										
1980	☐ Yes	☐ No																																										
<p style="text-align: center;">1.0 ORGANIZATION AND FACILITY DATA</p> <p>1.1 Facility Name _____</p> <p>1.2 Street Location (Hdqtrs/Admin) _____</p> <p>1.3 City _____ 1.4 State _____</p> <p>1.5 Telephone No. (____) _____ 1.6 Zip Code _____</p> <p>1.7 Officer-In-Charge of Radiological Safety</p> <p>1.7.1 Name _____</p> <p>1.7.2 Title _____</p> <p>1.8 Person Completing Form</p> <p>1.8.1 Name _____</p> <p>1.8.2 Title _____</p> <p>1.8.3 Date _____</p>																																												

LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT SURVEY

5.0 USE CLASSIFICATION FOR UNSEALED RADIOACTIVE SOURCES

Please indicate the percentage of total volume of unsealed radioactive material used for each category below. Total of all categories should equal 100%.

5.1 Human

- 5.1.1 () Diagnostic _____ %
 5.1.2 () Non-Diagnostic _____ %
 5.1.3 () Research _____ %

5.2 Animal

- 5.2.1 () Diagnostic _____ %
 5.2.2 () Non-Diagnostic _____ %
 5.2.3 () Research _____ %

5.3 General Research

- 5.3.1 () Physical _____ %
 5.3.2 () Chemical _____ %
 5.3.3 () Engineering _____ %
 5.3.4 () Other _____ %

Total of 5.1, 5.2 & 5.3 _____ 100 % (Specify)

YEARLY DATA SHEET INSTRUCTIONS

The following data sheets request information on radionuclides (isotopes) received and/or produced and radioactive waste generated, received, processed, shipped and disposed of on-site for calendar years 1978, 1979 & 1980.

The sheets are identical in format. As a convenience, a list of common radionuclides has been provided. Please report data as requested for all radionuclides handled by your facility. All quantitative data should be taken directly from facility records; if records are not available, please estimate answers as accurately as possible.

"Received/Produced" in Sections 8.0, 12.0 & 18.0 refers to radioactive emitting materials to be used at your facility. The term "Waste" as used in Sections 7.0-11.0, 13.0-17.0 & 19.0-23.0 refers to all radioactive emitting materials that have no further use at your facility and must be either disposed of on-site or transported to another facility. "Waste Generated" in Sections 7.0, 13.0 & 19.0 refers to that generated at your facility while "Waste Received" in Sections 8.0, 14.0 & 20.0 refers to waste received from other facilities. In Sections 9.0, 15.0 & 21.0 entitled "Waste Processed/Reduced", the column labeled "%" refers to percent reduction from the original volume to the reduced volume. The columns labeled A thru H on each sheet require the use of the key provided on this page for completion. Please select the appropriate answer from this key and insert the corresponding number(s) in the space provided for each radionuclide.

To insure accurate compilation, please report data in accordance with the units listed. Thank you very much for your cooperation. Space for additional comments is provided on page six.

KEY FOR COMPLETING
YEARLY DATA SHEETS

SECTIONS 9.0, 15.0 & 21.0

[A] REDUCTION PROCESS

- 1 = Compaction
 2 = Solidification
 3 = Evaporation
 4 = Adsorption (Ion Exchange)
 5 = Absorption
 6 = Incineration
 7 = Other

SECTIONS 10.0, 11.0, 15.0, 17.0, 22.0 & 23.0

[B] WASTE FORM

- 1 = Dry Solid(s)
 2 = Solid Liquid(s)
 3 = Nonsolid Liquid(s)
 4 = Scintillation Vials
 5 = Biological
 6 = Gaseous
 7 = Sealed Source
 8 = Other

SECTIONS 10.0, 16.0 & 22.0

[C] SHIPPING CONTAINER

- 1 = Kraft Container
 2 = 55 Gallon Drum
 3 = 30 Gallon Drum within
 55 Gallon Drum
 4 = Other

SECTIONS 10.0, 16.0 & 22.0

[D] ADDITIONAL HAZARD POTENTIALS

- 1 = Corrosive
 2 = Toxic
 3 = Flammable
 4 = Volatile
 5 = Explosive
 6 = Other

SECTIONS 10.0, 16.0 & 22.0

[E] DESTINATION

- 1A = Barnwell, South Carolina
 1B = Beatty, Nevada
 1C = Richland (Hanford), Washin
 1D = Other
 2 = Distribution in Product Form
 3 = Return to Vendor
 4 = Other

SECTIONS 10.0, 16.0 & 22.0

[F] TRANSPORT METHOD

- 1 = Facility Truck
 2 = Motor Express
 3 = Air
 4 = Rail
 5 = Other

SECTIONS 11.0, 17.0 & 23.0

[G] METHOD

- 1 = Release to Sewer
 2 = Combine with Common Refui
 3 = Incinerate to Atmosphere
 4 = Evaporate or Distill
 5 = Vent to Atmosphere
 6 = Bury On Site
 7 = Redistribute to Facility Users
 In Original Form
 8 = Other

[H] MONITORING INSTRUMENTATIO

- 1 = Ion Chamber
 2 = Thermoluminescent Dosimetr
 3 = End Window > 1.4 mgm/cm²
 Geiger-Mueller
 4 = Thin Window < 0.5 mgm/cm²
 Geiger-Mueller
 5 = Gas Proportional Counter
 6 = Liquid Scintillation Spectrom
 7 = Electron Capture
 8 = Other

[illegible]

(SEE DATA SHEET INSTRUCTIONS PAGE 2)

[illegible]

LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT SURVEY

24.0 SOURCE(S) OF RADIONUCLIDE PRODUCTION

- 24.1 Subcritical Reactor
 24.2 Critical Reactor
 24.3 Power Reactor
 24.4 Cyclotron
 24.5 Linear Accelerator
 24.6 Neutron Generator
 24.7 Synchrotron
 24.8 Van de Graaff Generator
 24.9 Other _____
 24.10 Other _____
 24.11 Other _____

POWER/FLUX LEVEL	RADIOACTIVE SOURCE	ACTIVITY IN CURIES	MODERATOR	MANUFACTURER

Comments & Remarks by Respondent:

25.0 FACILITY(S) FROM WHICH RADIOACTIVE WASTE WAS RECEIVED

25.1 FACILITY NAME	25.2 CITY	25.3 STATE	25.4 FACILITY LICENSE NUMBERS (IF KNOWN)

VACHON, NIX & ASSOCIATES

6855 Jimmy Carter Boulevard
 Building J, Suite 1020
 Norcross, Georgia 30071
 404/448-5235

SUBJECT: Low-Level Radioactive Waste Management Survey

Dear Licensee:

VACHON, NIX AND ASSOCIATES and the SOUTHERN STATES ENERGY BOARD, under a U.S. Department of Energy Contract, are developing State Briefing Books on Low-Level Radioactive Waste Management Issues. This project is being conducted with the encouragement of your State Radiological Control Officer as indicated by the attached letter. We need your help to ensure that your State issues are presented correctly. Thus, we ask you to provide us with data on the generation, handling and disposal of low-level radioactive wastes relative to your facility.

The enclosed questionnaire and return envelope are designed to help you provide these data. Please complete the form and mail to us within seven (7) days. I am sure you share my dislike for filling out forms. However, in this case we will be working together to ensure the safe and continued use of radioactive materials.

As soon as the project is completed for the twelve-state area of our survey, we will send the results to each of the states. Your State Radiological Agency will share the results with you.

Your facility will remain anonymous and data provided will be CONFIDENTIAL and reported in consensus and statistical form.

Thank you for your time and interest. Please call us at (404)448-5235 if you need assistance with the questionnaire, wish to ask questions or make specific comments relative to the project.

Cordially,

VACHON, NIX & ASSOCIATES

Reginald I. Vachon, Ph.D., P.E.
President

RIV/caw

DIVISION OF OPTIMAL SYSTEMS INCORPORATED
6855 Jimmy Carter Blvd., N.W. • Norcross/Atlanta, Ga. 30071 • Phone: 404-448-5235 • Telex: 708405 OPTIMAL NRCS

South Carolina Department of Health and Environmental Control

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COMMISSIONER
Robert S. Jackson, M.D.
2600 Bull Street
Columbia, S.C. 29201

April 21, 1981

MEMORANDUM

TO: All Radioactive Material Licensees
FROM: Heyward G. Shealy, Chief
Bureau of Radiological Health
SUBJECT: Low-Level Radioactive Waste Management Survey

The U.S. Department of Energy is conducting a survey of all radioactive material licensees in South Carolina. The purpose of this survey is to determine the amount and types of low-level radioactive waste generated in South Carolina and the current storage and disposal practices in connection therewith.

This survey will provide information for DOE's National Low-level Radioactive Waste Management Program. Your participation in this survey is strictly voluntary, and is not a requirement of the Department. However, your cooperation in this endeavor will be gratefully appreciated.

If you have any questions concerning this survey, please contact the persons designated in the accompanying instruction letter.

HGS:kn

VACHON, NIX & ASSOCIATES

April 28, 1981

Mr. Heyward G. Shealy
Chief
Bureau of Radiological Health
Dept. of Health & Environmental Control
2600 Bull St.
Columbia, South Carolina 29201

Dear Mr. Shealy:

VACHON, NIX & ASSOCIATES and the SOUTHERN STATES ENERGY BOARD appreciate your assistance to our project of developing a Briefing Book on Low-Level Radioactive Waste Management Issues for the state of South Carolina.

I have enclosed a copy of the survey package which is being mailed to all South Carolina Licensees today. This package includes your letter, a letter from VNA and the Low-Level Radioactive Waste Management Survey Form. After an elapsed period of eleven (11) days, follow-up phone calls will be made to selected non-respondents. Afterwards, twelve (12) days will be allowed for final response. Responses received after May 20 may not be included in data processing due to contractual time restraints.

Thanks again for your cooperation. If I can answer any questions, please call me at (404) 448-5235.

Cordially,

VACHON, NIX & ASSOCIATES

John Allen Gunn
John Allen Gunn
Project Manager

JAG/caw
Enclosure

Figure 5.4

SURVEY STATUS LOG

STATE CODE: _____

SERIAL NO: _____

DATE FORM MAILED: _____

DATE FORM RECEIVED: _____

DID FACILITY GENERATE AND/OR RECEIVE RADIOACTIVE
WASTE DURING 1978, 1979 AND/OR 1980?

☐

YES

☐

NO

Inquiry From: _____ Date: _____

Received By: _____ Phone #: _____

Type of Inquiry: _____ Letter _____ Phone

Questions: _____

Answers: _____

Action Items: _____ Action Taken By: _____ Date: _____

Telecon Follow-Up By: _____ Date: _____

Telecon With (Name): _____ Phone #: _____

Questions: _____

Answers: _____

Action Items: _____ Action Taken By: _____ Date: _____

Figure 5.5

INTRODUCTION

The purpose of this study was to compile data on the generation, handling, and disposal of low-level radioactive waste in the State of South Carolina. A total of 365 licensees were identified as producers or users of radioactive materials in the state. The licensees range from an individual physician to a nuclear power generating plant. Each licensee was sent via the U.S. Postal Service a packet containing the "Low-Level Radioactive Waste Management Survey" and other information as explained in Chapter 5.0. Figure 5 is a copy of the survey.

Compilation of the data generated by the survey is reported in Tables 6.1 through 6.13. Respondents to the survey were identified by one of the following seven broad categories: (1) Medical, (2) Educational, (3) Industrial, (4) Critical Nuclear Reactor, (5) Federal Government, (6) State Government, and (7) Other Jurisdictions (political subdivisions). Data in each of the above tables are presented for each category. A large number of respondents chose to identify multiple operations within a category. Thus, it is impossible to correlate between tables. Error analysis programs corrected for this problem wherever and whenever possible, but data presented in each table should be treated independently.

Two basic types of tables are presented, one revealing qualitative and quantitative data and the other revealing only qualitative data. The first table presents information on quantity of waste shipped by category and individual isotope. The latter presents information on type of container used for shipping, frequency of shipments containing hazardous materials, and techniques for volume and activity reduction.

hazardous materials, and techniques for volume and activity reduction.

Table 6.14 provides a forecast for low-level radioactive waste based on the limited information produced by this study. Additional studies covering a minimum of 10 years and a higher response rate would be necessary to add the desirable credibility to the forecast.

6.1 Summary

Of the 365 licensees, 96 (26.30 percent) responded to the survey. Of the 96 responding, 65 percent reported no waste generated and 35 percent reported both generation and shipment of low-level radioactive waste.

The total millicuries of low-level radioactive waste reported shipped during 1978, 1979, and 1980 was 34,176, 19,428, and 117.

The major limitation of this study is the large number of licensees who failed to return the survey. Another limitation is the small percentage of licensees who indicated that they generated and/or received waste but considered the information proprietary and did not report data for their facility. A final limitation of this study is the failure to respond of licensees who are known to manufacture and/or fabricate devices or items containing radioactive materials or devices capable of producing ionizing radiation that could generate nuclear waste.

Table 6.1 Respondents Reporting Nuclear Waste

Table 6.1 represents only those respondents to the survey who reported shipping nuclear waste in one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the total number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category.

TABLE 6.1 RESPONDENTS REPORTING NUCLEAR WASTES IN SOUTH CAROLINA

Facility	Number	%	Cumulative %
MEDICAL			
Hospital	13	59.1	59.1
Medical School	4	18.1	77.3
Physician	2	9.1	86.4
Other	3	13.6	100.0
EDUCATIONAL			
University-College	11	84.6	84.6
Other	2	15.4	100.0
INDUSTRIAL			
Manufacturing	4	57.1	57.1
Engineering	1	14.3	71.4
R & D	1	14.3	85.7
Other	1	14.3	100.0
CRITICAL NUCLEAR REACTOR	0	0	0
FEDERAL GOVERNMENT			
Non-Military	2	100.0	100.0
STATE GOVERNMENT	0	0	0
OTHER JURISDICTIONS			
City	1	100.0	100.0
TOTAL	45		

Table 6.2 Respondents Reporting Use of Sealed Sources Not Producing Nuclear Wastes

Table 6.2 represents those licensees using nuclear materials in the form of sealed sources who reported not shipping nuclear waste during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting not shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. Examples of Sealed Source devices were Strontium-90 eye applicators (Physicians); Radium-226 needles (Physicians); Iridium-192 (Manufacturing; Well-Logging and State Governments); Cobalt-60 (Manufacturing); and Cesium-137 (Manufacturing).

TABLE 6.2 RESPONDENTS REPORTING USE OF SEALED SOURCES NOT PRODUCING
NUCLEAR WASTES FROM SOUTH CAROLINA

Facility	Number	%	Cumulative %
MEDICAL	0	0	0
EDUCATIONAL	0	0	0
INDUSTRIAL			
Manufacturing	5	71.4	71.4
Engineering	1	14.3	85.7
Other	1	14.3	100.0
CRITICAL NUCLEAR REACTOR	0	0	0
FEDERAL GOVERNMENT			
Military	1	100.0	100.0
STATE GOVERNMENT			
Highway Department	1	100.0	100.0

TOTAL	9		

Table 6.3 Respondents Reporting No Waste

Table 6.3 represents those licensees using nuclear materials who reported not shipping nuclear waste during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting not shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. The numbers reported in this table represented all licensees from all categories.

TABLE 6.3 RESPONDENTS REPORTING NO WASTE IN SOUTH CAROLINA

Facility	Number	%	Cumulative %
MEDICAL			
Hospital	6	46.1	46.1
Medical School	1	7.7	53.8
Physician	3	23.1	76.9
Other	3	23.1	100.0
EDUCATIONAL			
University/College	3	50.0	50.0
Technical/ Comm. College	1	16.7	66.7
Other	2	33.3	100.0
INDUSTRIAL			
Manufacturing	12	44.4	44.4
Construction	1	3.7	48.1
Mining	1	3.7	51.8
Well logging/ Seismology/ Oil-gas exploration.	1	3.7	55.6
Engineering	4	14.8	70.4
R & D	2	7.4	77.8
Other	6	22.2	100.0
CRITICAL NUCLEAR REACTOR			
Commercial Power Reactor	1	100.0	100.0
FEDERAL GOVERNMENT			
Non-Military	2	100.0	100.0
STATE GOVERNMENT			
Highway Department	1	11.1	11.1
Health Department	3	33.3	44.4
Other	5	55.5	100.0
OTHER JURISDICTIONS			
County	2	100.0	100.0
TOTAL	60		

Table 6.4 Sealed Sources Producing Shipped Nuclear Waste

Table 6.4 represents those respondents to the survey who reported using nuclear materials as sealed sources and produced nuclear waste that was shipped during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. The respondents represented in this table were from the Medical and Industrial categories. Devices using Iridium-192 or combinations with other isotopes were used at the licensee's site until a marked specific nuclear activity dropped. This usually took place between six months and a year. When the activity was sufficiently low to interface with the device, the licensee shipped it to the original manufacturer-fabricator for a new sealed source in accordance with the licensee's authorized specific nuclear activity. The survey indicates that several users of these types of devices repeated the process of packing and shipping the source for another after decay as many as four times in the three-year period covered by this study. Those who responded by answering the appropriate questions on the survey form indicated that the sources were sent to manufacturer-fabricators in Louisiana and North Carolina. Others responding did not indicate the location of the manufacturer-fabricator. Other sealed sources included Cobalt-60 and Radium-226 which were shipped for disposal.

TABLE 6.4 SEALED SOURCES PRODUCING SHIPPED NUCLEAR WASTE FOR
SOUTH CAROLINA, 1978

Facility	Number	%	Cumulative %
MEDICAL			
Hospital	4	57.1	57.1
Medical School	3	42.9	100.0
EDUCATIONAL			
University/College	3	100.0	100.0
INDUSTRIAL			
Manufacturing	1	50.0	50.0
R & D	1	50.0	100.0
CRITICAL NUCLEAR REACTOR	0	0	0
FEDERAL GOVERNMENT	0	0	0
STATE GOVERNMENT	0	0	0
TOTAL	12		

TABLE 6.4 SEALED SOURCES PRODUCING SHIPPED NUCLEAR WASTE FOR
SOUTH CAROLINA, 1979

Facility	Number	%	Cumulative %
MEDICAL			
Hospital	4	57.1	57.1
Medical School	3	42.9	100.0
EDUCATIONAL			
University/College	3	100.0	100.0
INDUSTRIAL	0	0	0
CRITICAL NUCLEAR REACTOR	0	0	0
FEDERAL GOVERNMENT	0	0	0
STATE GOVERNMENT	0	0	0
TOTAL	10		

TABLE 6.4 SEALED SOURCES PRODUCING SHIPPED NUCLEAR WASTE FOR
SOUTH CAROLINA, 1980

Facility	Number	%	Cumulative %
MEDICAL			
Hospital	1	20.0	20.0
Medical School	4	80.0	100.0
EDUCATIONAL			
University/College	4	100.0	100.0
INDUSTRIAL	0	0	0
CRITICAL NUCLEAR REACTOR	0	0	0
FEDERAL GOVERNMENT	0	0	0
STATE GOVERNMENT	0	0	0
TOTAL	9		

Table 6.5 Millicuries of Nuclear Waste Shipped by Facility Type

Table 6.5 represents those respondents to the survey who reported shipping nuclear waste produced from all sources and categories during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of millicuries reported shipped. When a specific category was not reported by any licensee, a 0 is shown for that particular category. Each isotope reported on pages 3, 4, and 5 of the survey was included in this table. Isotopes and totals for the three years are shown in millicuries. By using a validation program, multiple reporting of the same isotope and quantity has been corrected in the totals; i.e., respondents were found to report duplicated data in both the Medical category and Educational categories.

TABLE 6.5 MILLICURIES OF NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1978. BY FACILITY TYPE

Facility	Millicuries	% Of Total
MEDICAL		
Hospital	1	0.00
Medical School	10	0.03
EDUCATIONAL		
University/College	11	0.03
INDUSTRIAL		
Manufacturing	350	1.02
R & D	33804	98.91
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.5 MILLICURIES OF NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1979 BY FACILITY TYPE

Facility	Millicuries	% Of Total
MEDICAL		
Hospital	1	0.00
Medical School	17	0.09
EDUCATIONAL		
University/College	18	0.09
INDUSTRIAL		
R & D	19400	99.82
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.5 MILLICURIES OF NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1980 BY FACILITY TYPE

Facility	Millicuries	% Of Total
MEDICAL		
Hospital	7	5.05
Medical School	39	26.67
EDUCATIONAL		
University/College	30	20.53
INDUSTRIAL		
R & D	70	47.75
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0
TOTAL MILLICURIES FOR ALL 3 YEARS:		53757.4

Table 6.6 Cubic Meters of Solid Nuclear Waste Shipped by Facility Type

Table 6.6 represents those respondents to the survey who reported shipping nuclear waste produced from all sources and categories during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of cubic meters reported shipped. When a specific category was not reported by any licensee, a 0 is shown for that particular category. Each isotope reported on pages 3, 4, and 5 of the survey was included in this table. Isotopes and totals for the three years are shown in millicuries. By using a validation program, multiple reporting of the same isotope and quantity has been corrected in the totals; i.e., respondents were found to report duplicated data in both the Medical category and Educational categories.

TABLE 6.6 CUBIC METERS OF SOLID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1978 BY FACILITY TYPE

Facility	Cubic Meters	% Of Total
MEDICAL		
Medical School	2.00	1.04
EDUCATIONAL		
University/College	4.00	2.09
INDUSTRIAL		
Manufacturing	0.45	0.24
R & D	187.00	97.68
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.6 CUBIC METERS OF SOLID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1979 BY FACILITY TYPE

Facility	Cubic Meters	% Of Total
MEDICAL		
Medical School	8.00	3.35
EDUCATIONAL		
University/College	10.00	4.18
INDUSTRIAL		
R & D	229.00	95.82
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.6 CUBIC METERS OF SOLID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1980 BY FACILITY TYPE

Facility	Cubic Meters	% Of Total
MEDICAL		
Medical School	12.00	8.45
EDUCATIONAL		
University/College	13.00	9.15
INDUSTRIAL		
R & D	129.00	90.85
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0
TOTAL CUBIC METERS FOR ALL 3 YEARS:		572.45

Table 6.7 Liters of Liquid Nuclear Waste Shipped by Facility Type

Table 6.7 represents those respondents to the survey who reported shipping nuclear waste produced from all sources and categories during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of liters reported shipped. When a specific category was not reported by any licensee, a 0 is shown for that particular category. Each isotope reported on pages 3, 4, and 5 of the survey was included in this table. Isotopes and totals for the three years are shown in liters. By using a validation program, multiple reporting of the same isotope and quantity has been corrected in the totals; i.e., respondents were found to report duplicated data in both the Medical category and Educational categories.

TABLE 6.7 LITERS OF LIQUID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1978 BY FACILITY TYPE

Facility	Liters	% Of Total
MEDICAL		
Medical School	5.00	17.86
EDUCATIONAL		
University/College	28.00	100.00
INDUSTRIAL	0	0
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.7 LITERS OF LIQUID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1979 BY FACILITY TYPE

Facility	Liters	% Of Total
MEDICAL		
Medical School	300.00	92.88
EDUCATIONAL		
University/College	323.00	100.00
INDUSTRIAL	0	0
CRITICAL NUCLEAR REACTOR	0	0
FEDERAL GOVERNMENT	0	0
STATE GOVERNMENT	0	0

TABLE 6.7 LITERS OF LIQUID NUCLEAR WASTE SHIPPED FROM SOUTH CAROLINA
FOR 1980 BY FACILITY TYPE

Facility	Liters	% Of Total
MEDICAL		
Hospital	1.51	0.16
Other	0.14	0.01
EDUCATIONAL		
University/College	0.14	0.01
High School	0.00	0.01
Other	0.00	2.11
INDUSTRIAL		
Pharmaceutical Mfg.	874.00	91.53
Other	20.14	2.11
CRITICAL NUCLEAR REACTOR		
FEDERAL GOVERNMENT		
Non-Military	31.00	3.25
STATE GOVERNMENT		
Other	28.00	2.93
TOTAL LITERS FOR ALL 3 YEARS:		1752.975

Table 6.8 Percent Responses to the Survey

Table 6.8 represents all licensees responding to the survey. When a respondent reported no waste shipped during the three years of the study period (1978, 1979, and 1980), the respondent's survey was divided into one of two major separations in the computer processing. This table illustrates the two groups: no waste generated and waste generated.

STATE	NO WASTE GENERATED	WASTE GENERATED	CUMULATIVE FIGURE
South Carolina	65.0	35.0	96

Table 6.9 Nuclear Waste Shipped in Millicuries Isotopes

Table 6.9 represents those respondents to the survey who reported shipping nuclear waste produced from all sources and categories during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of millicuries reported shipped. When a specific category was not reported by any licensee, a 0 is shown for that particular category. Each isotope reported on pages 3, 4, and 5 of the survey was included in this table. Isotopes and totals for the three years are shown in millicuries. By using a validation program, multiple reporting of the same isotope and quantity has been corrected in the totals; i.e., respondents were found to report duplicated data in both the Medical category and Educational categories.

TABLE 6.9 NUCLEAR WASTE SHIPPED IN MILLICURIES FOR SOUTH CAROLINA IN 1978

Isotope	1	2	3	4	5	6	7	8
H3	10	10	0	0	0	0	0	20
C14	0	1	0	0	0	0	0	1
CO57	0	0	4	0	0	0	0	4
I125	1	0	0	0	0	0	0	1
CS137	0	0	450	0	0	0	0	450
Other	0	0	33700	0	0	0	0	33700
TOTAL	11	11	34154	0	0	0	0	34176

NOTE: SOME RESPONDENTS REPORTED IN MORE THAN ONE CATEGORY. THE CUMULATIVE TOTAL DOES NOT REFLECT DOUBLE ENTRIES.

1=Medical

2=Educational

3=Industrial

4=Critical Reactor

5=Federal Government

6=State Government

7=Not Specified

8=Cumulative Total

TABLE 6.9 NUCLEAR WASTE SHIPPED IN MILLICURIES FOR SOUTH CAROLINA IN 1979

Isotope	1	2	3	4	5	6	7	8
H3	10	10	0	0	0	0	0	20
C14	0	1	0	0	0	0	0	1
P32	7	7	0	0	0	0	0	7
I125	1	0	0	0	0	0	0	1
Other	0	0	19400	0	0	0	0	19400
TOTAL	17	18	19400	0	0	0	0	19428

NOTE: SOME RESPONDENTS REPORTED IN MORE THAN ONE CATEGORY. THE CUMULATIVE TOTAL DOES NOT REFLECT DOUBLE ENTRIES.

1=Medical	5=Federal Government
2=Educational	6=State Government
3=Industrial	7=Not Specified
4=Critical Reactor	8=Cumulative Total

TABLE 6.9 NUCLEAR WASTE SHIPPED IN MILLICURIES FOR SOUTH CAROLINA IN 1980

Isotope	1	2	3	4	5	6	7	8
H3	10	0	0	0	0	0	0	10
C14	0	1	0	0	0	0	0	1
P32	28	28	0	0	0	0	0	28
CO57	7	0	0	0	0	0	0	7
I125	1	1	0	0	0	0	0	1
Other	0	0	70	0	0	0	0	70
TOTAL	46	30	70	0	0	0	0	117

NOTE: SOME RESPONDENTS REPORTED IN MORE THAN ONE CATEGORY. THE CUMULATIVE TOTAL DOES NOT REFLECT DOUBLE ENTRIES.

1=Medical	5=Federal Government
2=Educational	6=State Government
3=Industrial	7=Not Specified
4=Critical Reactor	8=Cumulative Total

Table 6.10 Nuclear Waste Shipped Classified by Hazard

Table 6.10 represents those licensees reporting the use of nuclear materials in all forms who reported shipping hazardous forms of nuclear waste during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. The number of times a shipment took place is represented in this table. Each hazardous classification reported in Sections 10, 16, and 22 of the survey are reported in this table. Potentially hazardous materials such as corrosive, toxic, flammable, volatile, and explosive materials are reported.

TABLE 6.10 NUCLEAR WASTE SHIPPED CLASSIFIED BY HAZARD FROM SOUTH CAROLINA

Facility	HAZARD CLASS					
	Corros.	Toxic	Flamm.	Volat.	Exp.	N.S.
MEDICAL						
Hospital	0	0	0	0	0	8
Other	0	0	0	0	0	3
EDUCATIONAL						
Other	0	0	0	0	0	3
INDUSTRIAL						
Other	0	0	0	0	0	3
CRITICAL NUCLEAR REACTOR	0	0	0	0	0	0
FEDERAL GOVERNMENT						
Non-Military	0	0	0	0	0	0
STATE GOVERNMENT	0	0	0	0	0	0
TOTALS	0	0	0	0	0	20

Corros.=Corrosive

Toxic=Toxic

Flamm.=Flammable

Volat.=Volatile

Exp.=Explosive

N.S.=Not Specified

Table 6.11 Nuclear Waste Shipped Classified by Container Type

Table 6.11 represents those licensees using nuclear materials who reported the types of shipping containers used for transporting nuclear waste during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. The number of times a shipment took place is represented in this table. Each container type classification reported in Sections 10, 16, and 22 of the survey are reported in this table. Shipping container types include Kraft containers, 55 gallon drums, 30 gallon drums within 55 gallon drums, and types not specified.

TABLE 6.11 NUCLEAR WASTE SHIPPED CLASSIFIED BY CONTAINER TYPE FORM FROM
SOUTH CAROLINA

Facility	CONTAINER CLASS			
	Kraft	55-Gal. Drum	30-55 Gal. Drum	Type Not Specified
MEDICAL				
Hospital	0	0	0	8
Other	0	0	0	3
EDUCATIONAL				
Other	0	0	0	3
INDUSTRIAL				
Manufacturing	0	0	0	1
R & D	0	5	0	0
Other	0	0	0	3
CRITICAL NUCLEAR REACTOR	0	0	0	0
FEDERAL GOVERNMENT				
Non-Military	0	0	0	3
STATE GOVERNMENT	0	0	0	0
TOTALS	0	5	0	21

Corros.=Corrosive
Toxic=Toxic
Flamm.=Flammable

Volat.=Volatile
Exp.=Explosive
N.S.=Not Specified

Table 6.12 Nuclear Waste Shipped Classified by Physical Form

Table 6.12 represents those licensees reporting the use of nuclear materials who reported the specific forms of the waste which was shipped during one or more years of the study period (1978, 1979 and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a zero is shown for that particular category. The number of times a shipment took place is represented in this Table. Each physical form classification reported in Sections 10, 11, 16, 17, 22 and 23 of the Survey have been tabulated in this Table. The waste forms reported were dry solids, solid liquids, non-solid liquids, scintillation vials, biological, gaseous and sealed sources.

TABLE 6.12 NUCLEAR WASTE SHIPPED CLASSIFIED BY PHYSICAL FORM FROM
SOUTH CAROLINA

Facility	PHYSICAL CLASS							
	1	2	3	4	5	6	7	8
MEDICAL								
Hospital	0	5	0	0	0	0	3	0
Clinic	0	0	0	0	0	0	3	0
EDUCATIONAL								
University/College	0	0	3	0	0	0	0	0
Other	0	0	0	0	0	0	3	0
INDUSTRIAL								
Manufacturing	0	0	0	0	0	0	1	0
R & D	3	0	0	0	0	0	0	2
Other	0	0	0	0	0	0	3	0
CRITICAL NUCLEAR REACTOR	0	0	0	0	0	0	0	0
FEDERAL GOVERNMENT	0	0	0	0	0	0	0	0
STATE GOVERNMENT	0	0	0	0	0	0	0	0
TOTALS	3	5	3	0	0	0	13	2

1=Dry Solids

2=Solid Liquids

3=Non Solid Liquids

4=Scintillation Vials

5=Biological

6=Gaseous

7=Sealed Source

8=Type Not Specified

Table 6.13 Nuclear Waste Shipped Classified by Reduction Process Used

Table 6.13 represents those licensees using nuclear materials who reported the reduction process of the waste shipped during one or more years of the study period (1978, 1979, and 1980). The categories of facilities are the same. The numbers reported in the Total Column represent the total number of licensees reporting shipping nuclear waste. Percentages were computed for each category to equal 100 percent. When a specific category was not reported by any licensee, a 0 is shown for that particular category. The number of times a shipment took place is represented in this table. Each reduction process classification reported in Sections 9, 15, and 21 of the survey have been tabulated in this table. The reduction processes reported were compaction, solidification, evaporation, absorption and incineration.

TABLE 6.13 NUCLEAR WASTE SHIPPED CLASSIFIED BY REDUCTION PROCESS USED BY SOUTH CAROLINA

Facility	REDUCTION PROCESS						
	1	2	3	4	5	6	7
MEDICAL							
Hospital	0	0	0	0	0	0	5
Medical School	0	0	0	0	0	0	2
Other	0	0	0	0	0	0	1
EDUCATIONAL							
University/College	0	0	0	0	0	0	5
INDUSTRIAL							
Manufacturing	0	0	0	0	0	0	2
R & D	0	0	0	0	0	0	1
Other	1	0	0	1	0	5	6
CRITICAL NUCLEAR REACTOR	0	0	0	0	0	0	0
FEDERAL GOVERNMENT	0	0	0	0	0	0	0
STATE GOVERNMENT	0	0	0	0	0	0	0
TOTALS	1	0	0	1	0	5	22

1=Compaction

2=Solidification

3=Evaporation

4=Adsorption(Ion Exchange)

5-Absorption

6=Incineration

7=Method Not Specified

APPENDIX A: Annotated Bibliography

ANNOTATED BIBLIOGRAPHY FOR SOUTH CAROLINA

"Antinuclear Pressure Growing in South Carolina; Barnwell Volume to be Cut," Nucleonics Week, November 1, 1979.

Governor Riley has been warning the other states for over a year about the need to develop other low-level nuclear waste repositories...the site is currently accepting over 2.4 million cubic ft/yr of low-level waste and its life is now at most 15 years.

Barnwell; It's Your Back Yard. Southeastern Natural Guard, Barnwell, SC. The Print Shop, Athens, GA. January 1980.

"This magazine offers information about the nuclear facilities in Barnwell: the effect and dangers of nuclear waste, serious unsolved problems, the political and economic realities we must face, and our options for the future." A collection of statements prepared for a coalition of safe energy groups in the Southeast who planned the Barnwell II Action.

Brief History of State Licensing Activities: Chem-Nuclear Systems, Inc. Barnwell, SC. Chem-Nuclear Systems, Inc. n.d.

Follows development from August 1969 when first application was received noting 26 amendments to license with 7 complete revisions. Information includes land utilization map/state-by-state monthly disposal amounts for 7/79 to 11/80. The economics of establishing a low-level facility in 1985 is presented in tabular format. Significant financial activity that Chem-Nuclear has had in the State of South Carolina is also presented for years 1976-1979.

The Chem-Nuclear Systems Low-Level Waste Disposal Site. Chem-Nuclear Systems, Inc. n.d.

Includes listing of monthly waste volumes for states (Sept. 79 thru Nov. 1980); DOE 1980 estimated low-level waste; economics of establishing a low-level waste disposal facility in 1985; and significant financial activity for Chem-Nuclear in the State of South Carolina.

A Classification System for Radioactive Waste Disposal - What Waste Goes Where? Ford, Bacon & Davis Utah; U.S. Nuclear Regulatory Commission. Division of Fuel Cycle & Material Safety. July 1978. (NUREG-0456; FBDO-224-10).

Survey of existing low-level waste disposal facilities (p. 19, Table 4) includes Savannah River and Barnwell, SC. Data covers commercial capacity, climate, nearby rivers, cover depth and observed radionuclide migration. Chapter 6: long-term storage/disposal site selection includes Barnwell, SC. Chapter 7: remedial action alternatives addresses decontamination and and the material removed to Barnwell, SC.

"Compromise Efforts Fails: Congress Passes Low-Level Nuclear Waste Bills, Leaves Broader Solution for Future," Congressional Quarterly Weekly Report, December 20, 1980.

When the nuclear waste bill appeared dead Dec 10, (Governor) Riley's office let it be known that the Governor was considering closing South Carolina's Barnwell dump to all out-of-state wastes if Congress did not pass a bill that at least dealt with low-level waste.

"Disposal of Low-Level Radioactive Wastes. Issue Brief." Science and Technology for the Legislature. Vol.5, No. 4, Fall 1979.

The "cutback in the amount of LLW to be accepted at the Chem-Nuclear Systems site in Barnwell, SC has caused a problem for generators of LLW...the Barnwell site had refused to accept scintillation vials or absorbed liquid wastes...Chem-Nuclear site must reduce the amounts of waste stored...Barnwell (at its present rate...) will reach its acceptance limit in 1979; NRC...can request DOE to accept commercial LLW...affected site includes Savannah River Plant.

Draft Environmental Statement Related to Operation of Virgil C. Summer Nuclear Station Unit No. 1. South Carolina Electric and Gas. Docket No. 50-395. U.S. Nuclear Regulatory Commission. Office of Nuclear Reactor Regulation. June 1979. (NUREG-0534).

Table 3.4 details estimated annual quantities of solid radioactive wastes from the Summer station. Table 4.20 details summary of environmental considerations for uranium fuel cycle including shallow land burial of low-level wastes. "The Commission notes in Table 4.20 that there will be no significant radioactive releases to the environment."

Draft Environmental Statement Related to the Operation of the Barnwell Fuel Receiving and Storage Station. Docket No. 70-1729. U.S. Nuclear Regulatory Commission. Division of Materials and Fuel Cycle Facility Licensing. May 1975. (NUREG 75/026).

During the operation of BFRSS, radioactive materials will be received...from these materials, small amounts of radioactive waste will enter the liquid waste streams...and solid wastes that will leave the plant. These wastes will be monitored...Waste handling and treatment systems...are discussed in the applicant's License Application (p.3-8).

"Efforts of States on Waste Disposal Problems Have Yet to Bear Fruit," Nucleonics Week, August 21, 1980.

The NGA report of 8/3 concludes that "the 3 States (SC, NV and WA) now with facilities for waste disposal are not going to accept the burden any longer..." The NGA task force found its origins with last years low-level waste repository shut-down at Barnwell, Beatty and Hanford.

Evaluation of Alternative Methods for the Disposal of Low-Level Radioactive Wastes. Ford, Bacon & Davis Utah, Inc.; U.S. Nuclear Regulatory Commission. Low-Level Waste Branch. July 1979. (NUREG/CR-0680; FBDO-209-03).

Table B.1 details capacities and waste quantities handled at existing sites including Savannah River and Barnwell, SC. Statistics include burial trench size; type and depth of cover; fill procedure; covering frequency; provisions for water collection and containment; volume buried and cumulative date. Table B.2 shows climatological and hydrogeological parameters at those sites. Table B-2 gives commercial low-level waste burial history for by-product material buried for years 1971-1976, and for low-level waste characterization of special nuclear materials and source materials.

An Evaluation of Low-Level Radioactive Waste Burial Ground Capacities at the Major DOE Reservations. Technology for Energy Corporation; Oak Ridge National Laboratory. National Low-Level Radioactive Waste Program. January 29, 1979. (ORNL/NFW-79/17).

Section 7. Savannah River Plant includes Table 15 (p.32): volume of solid low-level radwaste buried or non-retrievably stored from FY 1973 through FY 1977 and forecasted volume from FY 1978 through FY 1985 and the corresponding burial grounds requirements at SRP. Table 16 (p.35): authorized land for burial of solid low-level non-TRU radwastes at SRP.

An Evaluation of Nuclear Emergency Preparedness in South Carolina.

The State of South Carolina General Assembly Legislative Audit Council. Columbia, SC (1980?)

Review revealed a number of deficiencies in the overall state of emergency preparedness.

Fact Sheet on Low-Level Radioactive Biomedical Waste. National Academy of Sciences. Office of Information. November 13, 1980.

"Most of the wastes is generated in the larger research facilities in the eastern United States...disposal sites include Barnwell, SC; the site in SC will accept...a reduction of 2.4 to 1.2 million cubic ft/yr.

"Feeling the Pinch (Low-Level)," Nuclear News, December 1979.

DOE announced October 26 (1979) that it will hold off shipping low-level wastes to commercial disposal sites, including the Chem-Nuclear System facility at Barnwell. The 18 DOE or DOE contractor operations that generate low-level waste will now direct their shipments to 5 DOE preserves for temporary storage...including the Savannah River Plant in SC. By order of the SC Governor, the Chem-Nuclear site will take in 1/2 as much annually as it now does by October 1981.

Final Task Force Report on the Agreement States Program. U.S. Nuclear Regulatory Commission. Office of State Programs. December 1977. (NUREG-0388).

Appendix A, Attachment B lists agreement states with dates of agreements as signed and effective and number of licensees as of 12/31/76.

Identification and Assessment of the Social Impacts of Transportation of Radioactive Materials in Urban Environments. Battelle Human Affairs Research Centers; U.S. Nuclear Regulatory Commission. Division of Engineering Standards. July 1980. (NUREG/CR-0744; SAND 79-7032; B-HARG-411-049).

Table 3 listing state statutes governing the transportation of radioactive materials shows that the SC Code Sec. 13-7-70 governs general activities; keeping with access to records and manifests; loading, packing, labeling and marking; as well as monitoring, surveillance and inspection. S465 considers advance notification on proposed route and registration fees, permits and licensing for communities.

Identification of Socioeconomic and Institutional Barriers to Radioactive Materials Transportation. Project One. Southern States Energy Board Radioactive Materials Transportation Study. Draft Two. Atlanta, GA. October 6, 1980.

Overview of the low-level disposal facility at Barnwell, SC covers its location; burial capacity; burial statistics; limitations on burials; financial assurances; agreement states; state statutory authority; state regulation; public sector involvement; license and initiatives instituted at the state level in behalf of the executive and legislative departments of the government as well as those instituted on behalf of the operator. From 1973-1978 the files of the Transportation Technology Institute at Sandia National Laboratories list 130 radioactive material transportation incidents/accidents in SC. Relevant statutes and regulations for the State of SC are included.

Identification of Technical Problems Encountered in the Shallow Land Burial of Low-Level Radioactive Wastes. Evaluation Research Corporation; Oak Ridge National Laboratory. March 1980. (ORNL/SUB-80/13619/1).

The operating histories of burial sites at 6 major DOE and 5 commercial facilities in the US are examined, including Barnwell, SC. P.16 "hydrogeologic data available at most sites is insufficient to permit the design of an adequate monitoring system." Appendix (p. 56-61) gives site characteristics as to location, climate, geology, hydrology and ecology; licensing date and conditions; dates of operation; operation techniques and usage; monitoring and problems for Barnwell, SC. Similar information for Savannah River Plant on pages 136-145.

Institutional Radioactive Wastes. University of Maryland, Radiation Safety Office; U.S. Nuclear Regulatory Commission. Division of Safeguards, Fuel Cycle and Environmental Research. March 1978. (NUREG/CR-0028).

"It is notable that the largest fraction of the institutional waste volume (30%) is shipped to the Barnwell, SC site" (p.37), for institutions surveyed in 1975.

Interim Report. State Planning Council on Radioactive Waste Management. February 24, 1981.

Section IV: Low-level radioactive waste discusses the strict enforcement of shipping and packaging standards and the reduction of waste accepted at the South Carolina site.

"Inventory (1962-1978) and Projections (to 2000) of Shallow Land Burial of Radioactive Wastes at Commercial Sites: An Update," Nuclear Safety v.21, no.3, May-June 1980.

The U.S. Environmental Protection Agency has worked with the 6 states having commercial shallow land burial facilities for other-than-high-level radioactive wastes to provide inventories and quantities of wastes buried at these sites. Compilations and interpretations of the inventories are herein presented in tables and figures. Table 2 shows waste volumes, M^3 for SC site from 1977-1978; Table 3 details by-product materials in Ci; Table 4 lists special nuclear materials in g.; Table 5 includes source material in kg; Table 8 gives 1979 projected average annual volume of lowlevel waste generation, $10^6 M^3/y$ for 1979-1980; 1981-1990 and 1991-2000. "The projected cumulative volume of waste generated indicates that the burial capacity may be inadequate by the mid-1980's."

Letter from H.R. Oakley (Chem-Nuclear System) to K. Nemeth (SSEB). January 21, 1981.

Attachments show volume of waste received and buried at Barnwell for 9 Southern States, 1978-1980; generating customers in the State of Georgia; institutional wastes for the 9 states; and total institutional wastes received and buried at Barnwell from 1/75 to 9/79.

Low-Level Radioactive Waste Management. Proceedings of Health Physics Society. 12th Midyear Topical Symposium. February 11-15, 1979. Williamsburg, VA. U.S. Environmental Protection Agency. Office of Radiation Programs. May 1979. (EPA 520/3-79-002).

In 1977 national survey of radwaste volumes generated by large medical and academic institutions; 78% of the waste noted by respondents was shipped to the shallow land burial site at Barnwell, SC. Discussion of charges for burial at Barnwell. The operational experience at Chem-Nuclear's Barnwell Facility (p.133-140). History of shallow land burial, Table 1 (p.230) shows volume of wastes and amount of activity buried at low-level sites cumulative thru 1977.

Low-Level Radioactive Waste Management Report. Response to Public Law 96-573, the Low-Level Radioactive Waste Policy Act. U.S. Department of Energy. March 13, 1981.

Table 1, shows distribution of waste at burial site and includes Barnwell for low-level waste disposed of in commercial burial grounds by each state in 1979. Section B.2 details status of Barnwell, SC site as to locale, climatology, licensing, monitoring, fee structure and current allocation plan. "The State of South Carolina has closely monitored operation at Barnwell site and the site is well run" (p.27). Table 4 lists DOE low-level waste disposal sites, including the Savannah River Plant at Aiken, SC."...(DOE) sites would not be sufficient to handle the large increase in waste volumes which would result should commercial sites be closed..." Table A-2 lists commercial low-level rad waste, 1979 base year data for all states. Table A-3 lists low-level waste from present and projected reactor operations for all states. Table A-4 shows commercial low-level radioactive waste projection summary by region (1979-84). Figure A-1 outlines regional commercial waste volume projections, Region 1, Southeast.

"Low-Level Radioactive Waste Strategy Document," Radioactive Waste Technology Newsletter. August 1980. (ESIC-ORNL).

When the commercial disposal sites...leaving only the site at Barnwell, SC...projections indicate that sometime in the mid-1980s generators will produce more waste than the operating disposal sites will be able to accommodate.

Low-Level Waste Management Summary - Issue Brief. National Conference of State Legislators. Office of Science and Natural Resources. August 1, 1980. (EV/WR/LO).

Brief includes discussion of background of waste site; legislative issues; cases; policy actions (both state and federal); review of DOE interagency review group; establishment of State Planning Council; glossary of low-level related terminology and bibliography of references. Commercial burial sites include Barnwell, SC. Governor(s) of SC have voiced concern about potential dangerous operating conditions at the operating site in their State. Table 2 shows waste volume distributed by State (1978) and includes percentage of total U.S. volume. Governor of SC stated that (his) State should not be asked to continue to act as sole repository for the country's waste.

Meeting on Low-Level Radioactive Waste, Proceedings; held at Incline Village, Nevada, February 20-21, 1980. U.S. Nuclear Regulatory Commission. Office of State Programs. July 1980. (NUREG/CP-0013).

Concerns about waste volume reductions and high integrity containers, especially in the case of regulation by the State of South Carolina are expressed by J.N. McLeod (Southern Company Services); H. Oakley (Chem-Nuclear System, Inc.) addresses the inspection program as related to the Barnwell site on incoming shipments including discrepancies in those shipments for 6/20/79 to 1/31/80. Heyward Shealy (State of South Carolina) discusses the licensing for the Chem-Nuclear operation.

NRC Task Force Report on Review of the Federal/State Program for Regulation of Commercial Low-Level Radioactive Waste Burial Grounds.

U.S. Nuclear Regulatory Commission. Office of Nuclear Material Safety and Safeguards. March 1977. (NUREG-0217).

Appendix B - history of low-level waste management (Table B-1) covers location, operator, year of original license; whether or not TRU is accepted and operational rates for 6 sites including Barnwell, SC. Pages 55-57 outline summary of meeting with South Carolina attendees. Discussion included information drawn from South Carolina's experience.

Need for Greater Regulatory Oversight of Commercial Low-Level Radioactive Wastes. Report by the U.S. General Accounting Office.

August 16, 1978. (EMD-78-101).

Currently (78) there are 6 low-level waste burial grounds... Barnwell, South Carolina...however 3 of the 4 burial sites in the eastern United States, are no longer accepting waste for burial. As a result, the Barnwell, SC facility is the only eastern burial site. For political and economic reasons, SC recently imposed a monthly limit on the amount of waste buried at Barnwell. Because of this restriction, NRC has requested DOE for use of their burial facilities as backups.

Nuclear Energy Center Conceptual Study. Phase III: Site Specific Evaluation. Topical Report - Storage of Low-Level Radioactive Wastes. Gilbert/Commonwealth, Inc.; Southern States Energy Board. January 1981. (DOE/OR/06074-1. Vol. IX).

The prevalent method of LLW disposal is continuous offsite disposal at an existing facility such as the one at Barnwell, SC. The conceptual design of an onsite LLW disposal facility herein described is an improvement on the technology presently in use at Barnwell, SC; and it began with a review of the Lake Hartwell NEC site to locate the areas within the boundary suitable for a disposal facility for the shallow land burial type. "Increasingly stringent regulations on transportation and storage of radioactive waste and limited capacity of the currently licensed disposal facilities at Barnwell, SC, etc. has made it apparent that onsite storage of radioactive wastes may become necessary..."

"Nuclear Waste: Concern Growing over Problem, But Congress Can't Agree on Bill," Congressional Quarterly Weekly Report. November 1, 1980. Storage sites for commercial nuclear waste - existing and potential noted on Map of U.S. (p.3261).

Nuclear Waste Management Program. Summary Document. FY 1981. U.S. Department of Energy. Office of Nuclear Waste Management. March 1980. (DOE/NE-0008).

Section 2.4 - Savannah River Plant...significant amounts of LLW are routinely generated...LLW management is accomplished through shallow land burial at the onsite burial grounds...Approximately 320,000 cubic meters of solid waste buried on-site.

The Problem of Disposing of Nuclear Low-Level Waste: Where Do We Go From Here? U.S. General Accounting Office. Report to the Congress of the United States by the Comptroller General. March 31, 1980. (EMD-80-68).

As late as 1975, six commercial low-level waste burial sites were licensed to operate...only 3 remain operational...one in SC. On October 31, 1979, the Governor of SC ordered Barnwell to scale down...so that by October 1981 it would bury 1/2 as much annually...The Governor(s)...have stated that packaging and shipping problems must be corrected...they feel it is not appropriate...for three state(s) to shoulder the burden...urged other states to develop regional sites...unless the imbalance in low-level waste disposal is relieved, the state(s) may unilaterally decide to close their sites...

Radiological Emergency Response Planning Operations, Radiological Environmental Monitoring Programs and Highway Transportation of Radioactive Materials in South Carolina. Committee Report. South Carolina Joint Legislative Committee on Energy. Columbia, SC. April 1980.

The Committee, at this time,...nor did it consider arguments related to the support of or opposition to such issues as... low-level waste disposal in SC.

Regulation of Federal Radioactive Waste Activities. Report to Congress on Extending the Nuclear Regulatory Commission's Licensing or Regulatory Authority to Federal Radioactive Waste Storage and Disposal Activities. U.S. Nuclear Regulatory Commission. Office of Nuclear Material Safety and Safeguards. September 1979. (NUREG-0527 and Summary).

Appendix A - listing and inventory of DOE waste storage, disposal, and processing activities includes Savannah River Plant (p.A-6); where low-level waste are buried in the 200 area. Appendix B - DOE site description includes SRP at B.15 (p.B-43). Site description, and waste activities summary and description are outlined.

Review of "Draft Report of (DOE) Task Force for Review of Nuclear Waste Management." Document DOE/ER-0004/D dated February, 1978 (DOE Waste Report). Final Report. Governor's Task Force on Advanced Nuclear Systems. State of South Carolina. June 1, 1978.

In summary,..."some states prefer to continue to permit private operation of low-level waste burial grounds. Final DOE waste program plans should continue to enable this, and to permit 'Agreement States' regulation of low-level waste burial grounds on a cooperative basis with federal authorities." This report also contains Appendix-1 briefly describing the successful experience which SC has had with low-level radioactive waste disposal.

A State-of-the-Art Report on Low-Level Radioactive Waste Treatment. Oak Ridge National Laboratory. Chemical Technology Division. September 1980. (ORNL/TM-7427).

Appendix A "incinerators in radioactive service include Westinghouse Nuclear Fuel Division in SC." Appendix B "representative liquid-waste treatment systems at selected DOE sites..." include the Savannah River Plant (p.132-5).

Study of Chemical Toxicity of Low-Level Wastes. Main Report. General Research Corporation; U.S. Nuclear Regulatory Commission. Division of Waste Management. November 1980. (NUREG/CR-1793. Vol.1).

Issues regarding shallow land burial sites (p.2+) "in the Spring of 1979, South Carolina halted shipment of organic liquid wastes...on the grounds that the material -- as distinct from the radioactive materials itself -- was a threat to the environment." Table 2-6 (p.30) shows volume of non-fuel cycle waste received at SC burial site in month of March 1975 thru Dec. 1977. Table 4-2 (p.86) gives present status of licensing of commercial burial sites including Barnwell listing operator, ownership, activities licensed by NRC, activities licensed by state. Table 4-3 (p.89) details commercial burial site waste inventories (as of 1/1/79). Appendix 6 - environmental monitoring and the Barnwell Facility Program.

"Super Cemetery," by T.C. Langford, Jr., Up date (South Carolina Department of Health and Environmental Control) vol. 10, no. 4, Fall 1980.

This article gives overview of Chem-Nuclear disposal site operation and inspection techniques. With reference to the closing of other disposal sites. . .concerned legislators. . . use it as a model as they consider their plans for similar sites. This situation gives South Carolina a unique role to play in helping to determine the future path of nuclear waste disposal for the entire nation.

Survey of Current State Radiological Emergency Response Capabilities for Transportation Related Incidents. Indiana University. School of Public and Environmental Affairs; U.S. Nuclear Regulatory Commission. September 1980 (NUREG/CR-1620).

Chapter 3.0 contains question-by-question summaries of the survey data. Response from SC only in area of agents providing radioactive materials emergency response training. In SC the agencies involved include state and local police; local firemen; rad health personnel and CD/emergency services.

System Analysis of Shallow Land Burial. Appendix. Science Applications, Inc.; U.S. Nuclear Regulatory Commission. March 1981. (NUREG/CR-1963. Vol. 3).

Appendix A - Site visits includes A-2, site visit to Barnwell; Oct. 31, 1979 press release from Barnwell; volume limitation schedule and license #097 for Barnwell dated 10/30/79.

System Analysis of Shallow Land Burial. Technical Background. Science Applications, Inc.; U.S. Nuclear Regulatory Commission. Division of Waste Management. March 1981. (NUREG/CR-1963. Vol.2).

Barnwell, SC is included in Section 2: site description. Information covers location, topography and climate, and geology and hydrology. Table 5-6 (p.5-33) gives statistics on occupational exposure for various types of personnel at Barnwell, 1978.

Task Force on Low-Level Radioactive Waste Disposal. Final Report.

National Governors' Association. Washington, DC. August 1980.

In July 1979, the Governor(s) of...South Carolina... operating commercial low-level waste disposal sites, became concerned about the threat to public health and welfare posed by improper packaging and unsafe vehicles...Until recently, Barnwell accepted low-level waste without restriction, annually receiving in excess of 75% of the nation's commercial wastes...since mid-1978, SC has limited waste receipts at the Barnwell site to 2.4 million ft³/yr. On Oct. 31, 1979...a phased schedule to further reduce that limit to 1.2 million ft³ within 2 years. Because it is geologically unacceptable, SC also prohibits the burial of organic chemical waste which comprise a large fraction of the wastes generated by hospital, medical schools, and universities. SC has also refused to accept any waste from certain generators with records of poor packaging or shipping practices. Based on projected increases for 1980, Barnwell and sites in NV & WA can handle; but by 1990 with others closed only Barnwell will remain. Then five more sites will be needed.

Technology, Safety and Costs of Decommissioning a Reference Low-Level

Waste Burial Ground. Battelle-Pacific Northwest Laboratory; U.S. Nuclear Regulatory Commission. Office of Standard Developments. June 1980. (NUREG/CR-0570, Appendix, Vol.2).

Site at Barnwell, SC listed in Tables B. 1-2 and 1-3 showing radioactive waste buried at commercial sites as of 12/31/76 and comparison of annual volumes of radioactive waste...1974-1977 respectively.

"Three States Take Initiative in Low-Level Waste Control," Nuclear Industry. January 1980.

On Oct. 12, (1979) South Carolina initiated a sequence of steps limiting the availability of the Chem-Nuclear Systems, Inc. at Barnwell by banning further shipments of low-level waste from Comm. Ed. Co. of Illinois. On Oct. 30, (1979) H.G. Shealy, Chief of SC Bureau of Radiological Health amended Chem-Nuclear's operating license for Barnwell. The imbalance (the closing of Beatty and Hanford with limits at Barnwell) has resulted in SC receiving approximately 80 percent of the total low-level waste generated in this country.

Transportation Issues Regarding Low-Level Nuclear Waste. Teknekron, Inc. U.S. Department of Transportation. Office of Intermodal Transportation. June 1979. (DOT-P-10-79-25).

Report presents projections of annual amounts of government and commercial LLW. Describes present status at 3 existing burial grounds including Barnwell, SC. Authors assess the transportation effects of regional constraints on LLW management thru 3 scenarios. Case A assumes the status quo, with a restriction on receipt of wastes at Barnwell continuing indefinitely. Case C assumes that administrative restrictions on Barnwell is lifted. Table 2 shows government LLW generated in 1985. Table 4 gives figures on commercial waste streams generated in 1985 (by region, ie. Southeast and source, ie. university).

Transportation of Low-Level Radioactive Waste Into South Carolina.

October 1978 - September 1979. State of South Carolina, Bureau of Radiological Health; U.S. Nuclear Regulatory Commission. Office of State Programs. April 1980. (NUREG/CR-1434).

The Chem-Nuclear System, Inc. low-level radioactive waste burial site located in Barnwell County, SC was receiving approximately 80 percent of this type of waste generated in the U.S. Major highway routes used by carriers of low-level radioactive waste shipments in SC were identified during the study. The origins of the wastes, types and conditions of packages and containers as well as compliance with existing regulations was determined.

Transportation of Radioactive Materials in South Carolina. SC Department of Health and Environmental Control. Division of Radiological Health. Columbia, SC. January 1975.

"In addition, the shipments of low-level waste to Chem-Nuclear Systems, Inc. for land disposal has increased significantly during the past year."

"Two Sites Shut: Governors Criticize Low-Level Packaging," Nuclear Industry. November 1979.

"Incidents with those (shipments) improperly packaged have generated a lot of political heat in South Carolina... problems stemming from improper low-level packaging and transportation got rolling in July...SC Governor Richard Riley wrote a letter to the NRC and DOT, demanding that they develop a detailed plan to upgrade inspection and enforcement of shipments...In SC, 63 deficiencies were found in 43 shipments...there is sentiment in SC that it is unfair for those States (WA & SC) to accept low-level waste for all 50 states..."

APPENDIX B: General Bibliography

GENERAL BIBLIOGRAPHY

Addressing Public Concern in Siting a Regional Low-Level Radioactive Waste Facility. Waltham, MA: Energy Research Group, Inc. February 1981.

A Classification System for Radioactive Waste Disposal - What Waste Goes Where? Ford, Bacon & Davis Utah; U.S. Nuclear Regulatory Commission. July 1978. (NUREG-0456; FBDU-224-10).

Docket Book, (Fourth Meeting, Arlington, VA: Sept. 8-9, 1980); (Fifth Meeting, Phoenix, AZ: Jan. 8-9, 1981); (Interim Report, Feb. 24, 1981). State Planning Council on Radioactive Waste Management. Washington, DC.

Evaluation of Alternative Methods for the Disposal of Low-Level Radioactive Wastes. U.S. Nuclear Regulatory Commission. Low-Level Waste Branch. July 1979. (NUREG/CR-0680).

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Low-Level Radioactive Waste Management. Proceedings of Health Physics Society, 12th Midyear Topical Symposium. February 11-15, 1979. U.S. Environmental Protection Agency. Office of Radiation Programs. May 1979. (EPA 520/3-79-002).

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Low-Level Waste Management: A Compilation of Models and Monitoring Techniques. Volume 1-3. Science Applications, Inc.; Oak Ridge National Laboratory. April 1980. (ORNL/SUB-79/13617/2; SAI/OR-565-2).

Low-Level Waste: A Program for Action. Final Report of the National Governors' Association Task Force on Low-Level Radioactive Waste Disposal. National Governors' Association. August 1980.

Management of Low-Level Radioactive Waste. Volumes 1 and 2. Edited by M.W. Carter, et al. Based on papers presented at a symposium sponsored by Georgia Institute of Technology and others. May 23-27, 1977. Atlanta, GA. New York. Pergamon Press. 1979.

Managing Low-Level Radioactive Wastes: A Proposed Approach. EG&G Idaho, Inc.; U.S. Department of Energy. August 1980. (LLWMP-1).

NRC Task Force Report on Review of the Federal/State Program for Regulation of Commercial Low-Level Radioactive Waste Burial Grounds. U.S. Nuclear Regulatory Commission. Office of Nuclear Material Safety and Safeguards. March 1977. (NUREG-0217).

NRC Task Force Report on Review of the Federal/State Program for Regulation of Commercial Low-Level Radioactive Waste Burial Grounds. Analysis of Public Comments. U.S. Nuclear Regulatory Commission. Office of Nuclear Material Safety and Safeguards. October 1977. (NUREG-0217. Supp.1).

Need for Greater Regulatory Oversight of Commercial Low-Level Radioactive Waste. Report by the U.S. General Accounting Office. August 16, 1978. (EMD-78-101).

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The Nuclear Regulatory Commission Low-Level Radioactive Waste Management Program. U.S. Nuclear Regulatory Commission. Office of Nuclear Material Safety and Safeguards. September 1977. (NUREG-0240).

Nuclear Waste Disposal. Hearings before the Subcommittee on Nuclear Regulations. Part I. U.S. Congress, Senate. Committee on Environment and Public Works. 96th Congress, 1st Session, Sept. 11 and Dec. 11, 1979. (Serial No. 96-H27).

Nuclear Waste Disposal. Hearings before the Subcommittee on Nuclear Regulations. Part II. U.S. Congress, Senate. Committee on Environment and Public Works. 96th Congress, 2nd Session, Jan. 23-24, 1980. (Serial No. 96-H27).

Nuclear Waste Facility Siting. Oversight Hearing before the Subcommittee on Energy and the Environment. Session on Public Participation and Equity in Nuclear Waste Facility Siting. U.S. Congress, House, Committee on Interior and Insular Affairs. 96th Congress, 1st Session, June 28, 1979. (Serial No. 96-8. Part V).

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APPENDIX C: Selection of Newspaper Articles

May 10, 1981

Hazards come with age at Savannah nuclear plant

This is the first in a series of three articles on troubles in one of the country's critical defense plants by the only reporter who has ever been allowed access to the plant's nuclear safety documents. The series continues Monday in The Atlanta Journal.

By JOSEPH ALBRIGHT

South-Carolina Washington Bureau

SAVANNAH RIVER PLANT, S.C. — Worn-out equipment and human errors are interfering with the safe operation of the 27-year-old nuclear reactors that serve as the government's sole source of raw materials for nuclear warheads, according to information in previously secret plant reports.

A brochure on the Savannah River

Our Nuclear Dilemma

Part 1/ The Safety Problem

Plant, 25 miles down river from Augusta, Ga., one still boast. "No employee has been injured by a nuclear process or by exposure to radiation."

Statistically, this plant has always been an oasis of industrial safety compared to coal, steel and other industries. The reactors have operated with no serious

accidents since the early days of the hydrogen bomb, churning out enough plutonium and tritium for at least 10,000 warheads.

But internal plant safety reports contain evidence of trouble in the plutonium works as the country's oldest operating reactors get older. The safety reports were

among more than 700 pages of documents opened to a reporter's inspection after inquiries to the plant's owner, the U.S. Department of Energy.

"The number of incidents due to personnel and equipment failure has been trending upward since 1975," observed one safety report covering the last half of 1978. It was prepared by E.I. DuPont de Nemours, the contractor which, at the government's request, designed, built and has operated the reactors since 1953.

"The exact causes are unknown," the report said, "but a combination of more thorough reporting of incidents, aging of equipment and personnel turnover are possible contributing factors."

See NUCLEAR, 10A

Nuclear

Continued from 1A

The most recent reports showed that twice a week last year, the plant suffered some incident that in DuPont's judgment had "nuclear hazard potential." Each stripped away at least one layer of a reactor's envelope of safeguards, exposing workers or the public to some extra measure of radiation risk.

Thirty-eight such episodes were reported in 1979. There were 34 in 1978, 49 in 1977, 72 in 1976 and 106 in both 1975 and 1980.

Richard Denise, the plant's acting manager and a former assistant director for licensing of the Nuclear Regulatory Commission, said the number and type of incidents "is not considered alarming."

"The number of reactor incident reports has shown a general upward trend during the past six years," he said. "This trend was anticipated, and is correctly attributed to a lower threshold reporting requirement for reporting events as incidents, tighter operational requirements and personnel turnover."

"The number of incidents broadly defined as 'having nuclear hazard potential' are of concern, but an examination of the type and severity of these incidents establishes that this categorization is often not indicative of an actual nuclear hazard."

In the DuPont safety reports, "substandard job performance" or "deviation from procedures" were listed as the cause of nearly half of the reactor incidents in the last five years. They included:

- A worker dropped a socket from a socket wrench into P-reactor's emergency spray pump and then neglected to tell the reactor department about it. The socket was never found. (June 13, 1980)
- About 7,100 gallons of slightly radioactive water was siphoned into a storm sewer outside the K-reactor. Someone misread an engineering diagram and sent the waste water down the wrong pipe, causing the pipe to break. (January 25, 1980)
- About 5,760 gallons of slightly radioactive water was dumped into a process sewer at C-reactor when "a valve was inadvertently left open." (September 24, 1979)
- K-reactor's emergency core cooling water system was turned off prematurely because of "a failure in communications between the person shutting down cooling water pumps and the person establishing sources of cooling water." This was similar to a mistake which, at a less opportune moment, turned a trivial incident into a near-disaster at Three Mile Island three months earlier. (June 16, 1979)
- A spacing device to insure against accidental chain reactions while fuel is stacked in an underwater storage area was found missing at P-reactor. It had been omitted for two years and no one had noticed. (May 23, 1978)
- About 600,000 gallons of slightly radioactive water overflowed onto the K-reactor floor and some poured outside the building through an effluent canal. A valve had been left open during a pressure test. "It is not known when or how the valve was opened." (October 23, 1977)

None of the plant's safety reports are sent to any federal or state regulatory agencies, Denise explained. "They don't need the information . . . whether a pump tripped off or not."

Indeed, some of the more serious incidents, along with statistics on last production time, are reported to the plant's supervisors in Washington when the need arises. None of the reactor incidents has ever been publicly announced.

The documents were opened to a reporter on March 19 with the stipulation that the authors and titles could not be mentioned. Fifteen interviews with plant officials followed during the past two months.

Among the equipment failures noted in the DuPont reports, the most troubling involved the electrical systems needed to run cooling pumps, nuclear monitoring devices and other reactor controls.

What could have been taken as a warning came in a semi-annual DuPont safety report in December 1977. It told of a "significant increase" in incidents involving electrical or instrument components. "Most involved old equipment which failed from gradual degradation with age," the report said.

On July 9, 1978, a momentary "fault" interrupted power on the plant's everyday power grid. That failure should have caused the two big oil-burning standby generators to kick on immediately at each reactor. It should take only one of the two diesels to start the emergency cooling systems that would be needed if there was a leak in the normal cooling water pipes.

At K-reactor, both emergency diesel generators failed to start because of "separate relay malfunctions in each of the diesel starting circuits." The emergency core cooling system was without power, but only for 15 seconds.

"If offsite power had been lost concurrently with the diesel for emergency cooling water, the emergency cooling water valves would have been without power until the diesel generators could have been placed online manually," a DuPont safety report cautioned in the spring of 1979.

The Three Mile Island accident in March of that year spurred a flurry of committee meetings at Savannah River. One of the 33 resulting studies focused on this plant's "diesel engine backup systems." Meanwhile, the offending components in K-reactor's diesel starting circuit were replaced with modern electronic parts.

On Oct. 13, 1979, both emergency diesels at K-reactor failed to start because no one had reset them since the last time they ran. The incident was classified as a personnel error, not an equipment fault. By then, the backup diesel study was just getting started.

Two months later, Savannah River Plant suffered its third loss of offsite electrical power in 27 years.

On Dec. 5, 1979, a tractor pulling a bushhog mowed along into a downed South Carolina Electric and Gas Company line in North Augusta, S.C., 20 miles beyond the plant boundary.

One of the two dedicated power lines to the plant was knocked out by a cascading short circuit. At that point, the other dedicated line should have taken over the load. But a repairman had switched it off for half an hour to fix a power pole.

The plant has its own coal-fired electrical generating station that stays on all the time, producing about one-half of the power needed to run the whole plant.

But, like New York City during the 1965 East Coast power blackout, the plant lacked an automatic mechanism to "shed the load" from its least important operations.

When the power went out here at 8:34 a.m., the curtilage to the reactor buildings yanked up and down for 34 minutes, putting two of the three reactors into predicaments that weren't supposed to occur.

Jan. 28, 1981

Radioactivity means a cross

By DOUGLASS DAYDOFF
Staff writer

Hanford, Wash., and Beatty, Nev., — towns in the sparsely-settled American west — are hardly glamorous capitals of America.

But what goes on in those far-away towns is the stuff debates in North Carolina are made of.

In a typical year, more than 1,000 55-gallon drums containing low-level radioactive wastes are shipped to Hanford or Beatty from laboratories in the Research Triangle of North Carolina, interviews conducted by The Cary News show.

Hanford and Beatty are locations of low-level radioactive waste burial sites, two of only three such sites in the United States.

The third site, at Barnwell in South Carolina, is not often used by Research Triangle labs because many lab materials used locally are not suited for burial in the soil at Barnwell.

Lab wastes typically include glassware, paper towels, animal carcasses — anything in a modern laboratory that could come in contact with radioactive materials used in experimentation.

The wastes are placed in drums and packed with absorbent materials to soak radioactive liquids.

In the Triangle, much of the radioactive material is used to trace the progress of drugs as they pass through the bodies of laboratory animals.

Shipping the drums out west is an expensive operation costing about \$300 per drum, said a spokesman for Duke University, one of the major waste producers in Wake and Durham counties.

But the drums may not be shipped to Washington much longer. A statewide referendum passed last November will gradually close the Hanford location over the next two years to all except in-state producers of low-level radioactive waste.

Political actions such as these have resulted in a movement among some industrial and public officials to explore the possibility of a low-level radioactive waste burial site in the Triassic Basin — a band of dense clay running through Western Wake County, Durham County, Orange County, Chatham County and Lee County.

Such a burial site could be a solution, government and private officials say, to a problem which threatens the area's research economy.

Establishment of a site could also boost the state's prestige when looking for industry, one industrial official said.

But environmental groups said at a public meeting in Raleigh last week that the state should discourage hazardous and low-level waste producing firms from settling in North Carolina.

In Wake and Durham counties, 13 facilities hold 13 state-issued licenses to handle radioactive materials which could result in generation of low-level radioactive waste.

In practical circumstances, though, only eight facilities actually produce low-level waste in the two-county area.

But these facilities include major employers in the Triangle, like Duke, N.C. State University, state government and a host of facilities at Research Triangle Park.

Duke, for example, ships about 100 barrels per month to Hanford, said Dave Jorgensen, an assistant radiation safety officer.

Duke is also the agent for the Piedmont Carolina region of the American Red Cross, based in Durham, said Don Bennett, the Red Cross's technical director in Durham.

The Red Cross produces about 12 drums a year of low-level radioactive waste in the course of its testing for hepatitis at the Durham facility, Bennett said.

A third license-holder in Durham is N.C. Central University, but the school produces a minimal amount of low-level radioactive waste — less than one cubic foot in a year — said Dayne Brown, head of the state's Radiation Protection Section.

In Wake County, there are three license-holders permitted to use the materials which could result in low-level radioactive waste.

But one of the license holders, DuPont, actually uses its materials on a test farm in Johnston County near Clayton, said Chuck Evans, a member of Brown's staff.

Herbicides and pesticides are tested on the Johnston County farm by the DuPont chemical firm, Evans said.

The two other license-holders

-country journey for wastes

in Wake County are both branches of state government.

The state Department of Human Resources uses several radioactive materials in its divisions of health and mental health, said Willie Lee, a health physical.

But he said little radioactive waste is generated.

But N.C. State University is a major waste producer, shipping out about 220 drums of radioactive waste per year, according to figures provided by Brown.

Many waste producers are located in Research Triangle Park.

But two firms in the park —

Monsanto and Northrop — hold licenses to use the radioactive materials but do not produce much waste, spokesmen said.

Other firms do ship out waste.

Chemical Institute of Toxicology ships about two drums of radioactive waste per month to Hanford, said a spokesman.

Baxter-Dickinson produces about five cubic feet per month of low-level radioactive waste and ships it to Hanford or Beatty, a spokesman said.

A spokesman for Research Triangle Institute declined to specify how much low-level radioactive waste is produced by the research facility.

Mar. 2, 1981

Nuclear waste issue narrows

The recent interim report of the State Planning Council on nuclear waste was important beyond its helpful suggestion for a cooperative federal-state management effort.

The main thing was its strong suggestion that the government place primary emphasis on permanent disposal of high level waste.

That puts the planning council, headed by South Carolina's Gov. Dick Riley, a Democrat, on the same general track with Energy Secretary James Edwards, a key Republican. Not long ago, the secretary indicated his desire for emphasis on permanent storage when he opposed temporary away-from-reactor storage of high level waste because that would delay a decision on permanent storage.

Therefore, the two statements indicate the possibility for an early national consensus and a bipartisan approach to high-level waste management.

Riley's statement to the nation's governors was interesting for another reason: It recommended a federal-state partnership on waste management, which he said would mean "there can be neither arbitrary imposition of federal will nor arbitrary actions by the states to block waste management decisions."

The Riley report included discussion of other nuclear waste matters, such as state responsibility for low-level waste disposal, and transportation of nuclear refuse. But emphasis on a national plan for high-level waste was the most significant point. Like Secretary Edwards' testimony, it focuses on the need for a decision which, as the secretary said, "we've put off for 30 years."

Signs of a possible consensus on developing a policy are encouraging because at best it will be difficult to reach a final decision on permanent storage of high level nuclear waste. No state wants a nuclear waste disposal site, even though there are ways to solidify the material for storage in places well away from large bodies of either surface or ground water.

The necessity for permanent disposal is clear. It is unsafe to continue keeping long-lasting, dangerous radioactive wastes in temporary tanks close to major aquifers. The presence of more than 25 millions of gallons of waste on the Savannah River nuclear reservation in South Carolina threatens an aquifer underlying parts of at least two states.

The planning council report points the way toward a final decision: "consultation and concurrence among public officials, all of which is intended to arrive at a consensus as to where and how the waste is buried." The process would entail participation by elected officials "at all levels of the federal system."

The tenor of the interim report argues for continuation of Gov. Riley's leadership on the council, especially in view of his important role in establishing a national policy on low-level nuclear waste management.

The nation needs the cooperative efforts of Democrats like Riley and Republicans like Edwards in order to solve the nuclear waste problem. Both have dealt with it at close range as governors of a major nuclear state; and now are in position to influence the inner workings of the administration and Congress.

NRC Eases Nuclear Waste Rules

Washington Post

WASHINGTON — The Nuclear Regulatory Commission (NRC) has declared that irradiated animal carcasses and some laboratory equipment no longer must be classified as low-level nuclear waste.

The action affects about 15% of the country's low-level nuclear waste, which may be buried at only three sites — in Washington State, Nevada and at the Chem-Nuclear dump near Barnwell, S.C.

The ruling means carcasses and vials in which irradiated tissue is tested can be burned or buried in ordinary landfills.

This will save hospitals and research laboratories \$13 million annually in transport, packaging and disposal costs while posing no danger to the public, the NRC said.

(David Ebenhack, health and safety manager at the Barnwell dump, said the decision will have little effect on the facility because it receives few animal carcasses and stopped taking some hospital waste in 1979.)

The NRC also increased the amount of radioactivity that can go into sewerage systems, calling the increase from one to six curies "a negligible addition to the amount of radioactivity from these materials already present in the natural environment."

An estimated 80,000 cubic feet of burial space at existing low-level waste dumps is used every year for 55-gallon drums containing carcasses of rats, mice and other animals in which radioactive trace elements have been used to help study the effects of experimental drugs.

Another 400,000 cubic feet is taken up by drums containing vials in which the animals' blood or tissue was analyzed.

These two items comprise half of all medical radioactive waste.

Richard Cunningham, director of the NRC's fuel cycle and material safety division, said the rest is X-ray film, wiping rags and other materials. All contain

"very low levels" of radioactivity, he said.

A person living about 125 feet downwind of an incinerator burning carcasses and vials from a major hospital, he said, would receive 1 millirem of additional radiation a year. A coast-to-coast round trip by jetliner gives 3 millirems of radiation.

"Historically, it was cheap and simple to send everything to a waste burial ground," Cunningham said. About two years ago, however, disposal costs and transport charges began rising as burial space dwindled, and the three burial sites closed down temporarily to protest lax federal enforcement of waste packaging rules.

"At that point, the labs recognized this as a problem, and we did, too," Cunningham said. Burial often posed difficulties because decomposition gases occasionally ruptured buried drums. The new policy will solve those problems by permitting conventional disposal methods to handle the wastes, Cunningham said.

Mar. 31, 1981

States Grapple With Mandate To Dispose of Atomic Waste

By KIM ALLEN

Staff Reporter of The Wall Street Journal

STATES ARE PLAYING A LIVELY GAME of musical chairs over the issue of low-level radioactive waste disposal, a subject known to cause outbreaks of yawns a few years ago. Not any more. "There's no technical problem here," says an Edison Electric Institute official. "It's all political."

The politics grew from federal legislation passed last December that says that states are responsible for their own low-level radioactive waste from nuclear power plants and from medical and commercial facilities. It encourages them to form interstate compacts with neighboring states to get rid of the stuff at regional disposal sites. It all sounds very orderly.

And then things get complicated. Starting in 1986, states joined in compacts will be able to prevent nonmember states from disposing of low-level waste at their facilities. Few states want to be left out in the cold. Membership in a compact means lower disposal costs because the expense of building and maintaining a waste facility is spread among member states. And without enough volume, a waste facility is a losing business proposition.

"Respons will be out of luck if they don't have a site by 1986," says Ray Peery of the Southern States Energy Board. Adds Patrick Costello, counsel to Idaho Governor John Evans, "You're going to see a lot of scrambling."

THE PACIFIC NORTHWEST IS CLOSEST to a compact, and the South has made substantial progress. It's no coincidence that these two areas have two of the three existing commercial sites for low-level waste. (The three sites: Hanford, Wash.; Barnwell, S.C., and Beatty, Nev.). The Northeast is beginning to move toward a compact, while the Midwest, second largest generator of the radioactive waste, is farthest behind.

The biggest stumbling block, predictably, is the location of disposal sites. By 1990, according to a study by the National Governors' Association, a total of at least six regional sites will be needed. By that time, the volume of low-level waste is expected to be more than triple the estimated 89,000 cubic meters generated last year. Who in these groups will get stuck with the radioactive waste facilities? "A state's going to have to take the political heat to take on a site," says one expert. "Only then will compacts come about."

A few states—Texas, Massachusetts, Kansas and Virginia among them—are planning for sites within their own borders and could become hubs of future state groupings. But most states want no part of the host role. "No one wants to touch it in Michigan," for example, says Gail Nelson of the National Conference of State Legislatures. "There's real inertia there because it's linked with high-level radioactive waste."

CALIFORNIA HAS A PROBLEM all its own, dubbed "the 800-pound gorilla syndrome" by an expert. The state produces more low-level waste than all of the other Western states combined, yet it is resisting any disposal facility within its borders. Under those terms, no one wants California in a compact.

Idaho's Mr. Costello says of California and its stand on a disposal site: "It's the center of gravity, and it should acknowledge this. It would be uneconomical and politically unacceptable to the smaller states for California not to take it."

Phillip Greenberg, a representative of California Gov. Edmund Brown, concedes the state's position is "awkward," particularly if Nevada follows through on Gov. Robert List's promise to close the Beatty disposal site when it becomes full by the mid-1980s.

People in Nevada, Washington and South Carolina are tired of taking everyone else's low-level waste. Govs. List and Richard Riley of South Carolina have said that no one should assume that their states will be the homes for facilities provided for in future compacts. Nevada, which generates small amounts of radioactive waste, has done more than its share for years, aides to Gov. List complain.

The people of Washington voted last November to exclude from the Hanford disposal site most low-level waste from any other state that isn't in a compact with Washington. The exclusion takes effect July 1, but few believe it could survive a court challenge because the timetable is at odds with the new federal law. But Washington made its point. It will take waste, but on its own terms.

LEGISLATION CREATING an eight-state compact in the Northwest was passed in the Idaho legislature last week and is pending in Washington. If any two legislatures act favorably before they adjourn this spring, the compact could become a reality this year. Other states in the group would be Alaska, Hawaii, Montana, Utah, Oregon and Wyoming.

Three clusters of states in the South have met to discuss the issue. One group includes nine Southeastern states stretching from Virginia to Florida. But Virginia also has met with five states farther north. A third group has met with Kansas. Some experts believe that Texas and Louisiana may be needed in the Kansas group to provide enough waste volume to make a compact worthwhile.

Northeastern states met a few weeks ago. Only the industrial Midwest states haven't met on the issue since the federal legislation was passed in December. Says William Taylor, science adviser to Michigan Gov. William Milliken, "So far, no governor has taken the lead to get the ball rolling."

Feb. 8, 1981

States Facing Nuclear Waste Problems

MONTEREY, Calif. — "Regional initiatives" may not sound like a titillating topic, but the executives of the American Nuclear Society who met last week in this northern California town known for its sparkling bay and Spanish-style adobe houses found it fascinating.

South Carolinians should, too.

The society's nuclear engineers and industry executives learned that "regional initiatives" on nuclear waste disposal are at last going forward. If they are successful, it will mean that the increasingly heavy burden of disposing of most of the nation's low-level nuclear garbage finally will be spread around and will no longer fall disproportionately on the Palmetto State which had been accepting upwards of 80 percent of the stuff.

SHARING THE BURDEN was mandated by federal legislation pushed by S.C. Governor Dick Riley and passed in December of 1980. Each state now has the responsibility for burying its own low-level radioactive waste; the states have been authorized to form regional compacts to dispose of that waste.

Nine states attended a meeting in Columbia called for just this purpose on Jan. 5. Six states plus the District of Columbia attended a meeting called by Gov. John Dalton of Virginia on Jan. 6.

Regional compacts are not being discussed only in the South, the American Nuclear Society was told. The northwest tier of states held the planning session in January in preparation for a second regional conference held this month in Seattle.

In the Midwest, discussions among several states have been under way since early 1980.

In the West, the Western Interstate Energy Board and the Council of State Governments are playing active roles in that region's efforts.

In the Northeast, the New England Regional Commission has begun a study of the options for a regional compact.

THESE STATES are acting quickly not only because of the new federal legislation, but also because time is of the essence.

The only states with sites where commercial low-level waste can now be buried are Washington, Nevada and South Carolina. But Washington voters approved a referendum on Nov. 4 to close the disposal site at Hanford to out-of-state nuclear garbage beginning next summer.

The governor of Nevada has vowed to close that states' dump at Beatty, while Governor Riley is cutting the amount by half of nuclear trash that the Barnwell, S.C., site accepts.

The other states in the country realize that they must act now or possibly be left out in the cold, with large amounts of nuclear waste and nowhere to bury it.

BUT THE ISSUE is as politically sensitive in other parts of the country as it is in South Carolina. Take Illinois for example. "Many people there believe it's all right for us to take care of our own low-level waste," says Phil Gustafson, a nuclear physicist who now works for the state of Illinois. "But many people draw the line at accepting waste from other states. It's not going to be easy."

The Midwest and Northeast states — both of which generate large amounts of nuclear waste — will be crucial to the success of the regional compact idea being pushed by Governor Riley.

There seemed to be an increasing realization among the American Nuclear Society members that the issues here are primarily political, and not technological. The techniques to safely dispose of low-level waste may be on hand, but the problem is getting people to believe it and to accept it in their own back yards.

THE CHARLOTTE OBSERVER

Feb. 17, 1981

Dumping Opposed

A plan to ship two low-level radioactive steam generators to the Chem-Nuclear Services Inc. burial site at Barnwell, S.C., has drawn opposition from the Palmetto Alliance. The total amount of radioactivity emitted by the two generators being disposed of by Florida Power and Light Co. would be more than South Carolina allows for radioactive waste being dumped at the site during a year, a spokesman for the anti-nuclear alliance said.

Feb. 7, 1981

Group: nuclear waste limit waiver sought

By BUNNY RICHARDSON
Record Staff Writer

The Palmetto Alliance has charged that the state Department of Health and Environmental Control and Florida Power and Light are privately negotiating to waive the state's limitations on how much low-level radioactive waste can be buried in South Carolina.

DHEC attorney Richard P. Wilson said the agency has talked only informally with officials of Chem-Nuclear Systems Inc., who were contacted by FP&L.

He stressed that FP&L has not applied for "a special permit for a special shipment" and that if a waiver is granted, it would be only for FP&L and not "a wholesale waiver" of the limitations.

The state limits how much waste can be buried each month at Chem-Nuclear's facility near Barnwell and that amount is being reduced over a period of time. Chem-Nuclear allocates space to the companies and utilities that use its burial facility.

FP&L wants to ship a large volume of waste from

its Turkey Point nuclear station near Miami to Chem-Nuclear, but it cannot without the waiver because by the time the waste can be shipped, the volume would exceed the utility's monthly allocation, Wilson said.

It will be more than a year before the waste can be transported because FP&L must obtain permits from the federal Nuclear Regulatory Commission, he said.

Palmetto Alliance spokesman Michael Lowe said the utility plans to replace six steam generators at Turkey Point and wants to bury 1,200 tons of radioactive stainless steel and other alloys from the generators at Chem-Nuclear.

Lowe fears granting the waiver will increase South Carolina's image "as a radioactive graveyard" and he said the alliance does not want "a precedent set that would allow us to become a handy junkyard for nuclear mistakes."

He said it will cost FP&L from \$500 million to \$1 billion to replace the generators, and he estimated the utility would pay Chem-Nuclear about \$3 million to dispose of the waste.

over Barnwell

The Reagan administration is considering federal purchase of the privately owned Barnwell Nuclear Fuel Plant, for full scale operations as a spent fuel reprocessing station.

This probably means the plutonium controversy with all its frightful contents is about to hit the national fan again.

Concern about accumulating weapons grade plutonium that is a by-product of nuclear fuel recycling is legitimate enough. There is serious and informed worry, too, about drawing more nuclear wastes to South Carolina on a temporary storage basis with no permanent disposal yet assured.

The time would seem at hand, though, to switch from hand wringing to answer seeking on the fundamental question posed in the Barnwell facility.

After 30 years of developing nuclear energy technology, the resulting buildup of temporarily stored spent fuel demands a solution: either recycling of the spent fuel to reduce the danger it poses, or scuttling of the processes that are adding to this hazardous waste.

A fuel recycling answer was asserted years ago by the Congress and successive administrations. In consequence, three companies joined to form Allied General Nuclear Service, and build the \$280-million Barnwell facility as a commercial nuclear fuel reprocessing plant.

Former president Ford put it on temporary hold, and Jimmy Carter made the hold a formal national policy, though more than \$10 million a year in federal funds continues to be pumped into it to

keep a cadre of trained people and to maintain a degree of operational readiness.

There are doubts, such as Energy Secretary James Edwards expresses, about the currentness of the Barnwell technology. There are other serious concerns about controlling emission levels during any full scale during any full scale reprocessing operations.

Other countries, for instance France, have moved beyond such doubts and are actively reprocessing nuclear fuel. This is not in spite of plutonium fears but because they also are developing plutonium-fueled nuclear processes that are a generation ahead of U.S. technology.

Maybe the French and others are foolish, wasting money or courting disaster. But that is an issue of discriminating judgment, while U.S. policy is one of paralysis based on fear.

A commitment to federal acquisition and opening of Barnwell would acknowledge the fuel recycling route is probably the only alternative to eventually scuttling nuclear energy in this country.

At bottom, it calls for nothing more than public trust in the competence and prudence of the national administration to proceed with care.

Some people don't have that confidence in anyone who doesn't share their doubts about nuclear energy itself.

These critics deserve to be heard, but not so often agreed with. They have created considerable confusion and distrust, and have pretty much shaped our current national policy of indecision and inaction on fuel reprocessing.

Feb. 6, 1981

Senators fear nuclear waste measures weak

By Ed Vogel
Staff Writer

CARSON CITY — Several senators Thursday expressed doubts about the strength of legislation designed to manage the flow of nuclear wastes to the Beatty dump.

"We're exposing our children and people to health problems nobody else wants," said Sen. Jim Bilbray, D-Las Vegas. "I'm fearful for our people."

Bilbray told members of the Senate Human Resources Committee the bills authored by Sen. Lawrence Jacobsen, R-Minden, were not strong enough. Jacobsen's bills would not reduce the amount of low-level nuclear wastes going to the dump near Beatty.

Bilbray said he will introduce legislation allowing only materials generated in Nevada to be shipped to Beatty. Consequently, no action was taken on Jacobsen's five bills.

The Las Vegas senator's comments were echoed by Sen. Jim Kosinski, D-Sparks.

"You seem very calm about this," Kosinski told Jacobsen. "I think you'd sell the island for a box of beans."

If shipments of wastes to the Beatty dump continue at the present rate, the facility will be filled by 1985, said Ralph DiSibio, the state Human Resources director. The volume of shipments to Beatty has increased by 64 percent over last year, he added.

More and more materials are expected to go to the Nevada dump since voters in Washington state banned out-of-state shipments to their dump.

Officials in South Carolina also soon may reduce the

amount of waste going to their facility.

The three dumps are the only depositories for commercial low-level nuclear wastes in the United States.

Even more nuclear waste materials, however, are shipped to the Nevada Test Site, about 40 miles down the road from Beatty. These wastes are generated by federal installations and apparently are beyond state control.

"It seems like 70 percent of the nation's wastes will go through Las Vegas, Reno or Elko," Bilbray said.

However, 75 percent of the nuclear wastes at the Beatty dump could have been disposed of "at your local dump," Jacobsen said. Most are nuclear medicine wastes from hospitals, he added.

"I didn't see anything more hazardous there (at Beatty) than an outdoor outhouse a couple years ago," he added.

Jacobsen pointed out not one Beatty resident objected to the dump when a legislative subcommittee held hearings there.

In addition, Sen. Joe Neal said Nevadans receive benefits from nuclear energy, such as X-ray machines and hospital isotopes.

"Surely we wouldn't want to be without them?" asked Neal.

Not only nuclear wastes, but chemical wastes and other hazardous materials should be regulated, added Verne Rosse, director of wastes for the state Division of Environmental Protection.

"We've had problems already" with hazardous wastes, Rosse said.

ENERGY USERS REPORT - CURRENT REPORT
(Bureau of National Affairs)

Feb. 5, 1981

Nuclear Energy

**FIVE TO 10 YEAR ON-SITE CAPACITY
ADVISED FOR LOW-LEVEL WASTE STORAGE**

MONTEREY, Calif. — (By a BNA Staff Correspondent) — Electric utilities building nuclear power plants should be prepared to store low-level waste material on site for at least 10 years because of a possible shortage of disposal sites, a Department of Energy official warned here February 2.

Addressing an American Nuclear Society conference on state and federal roles in waste management, George B. Levin, program manager of DOE's low-level waste management program in Idaho, noted that the three existing disposal sites are adequate for only three more years.

"If I were a utility executive, I'd be concerned," Levin said when asked how low-level waste generators should plan for the future. During the 1970s the number of disposal sites dropped from six to three, and there is considerable uncertainty about when new sites will be opened.

Despite his warning to utilities, Levin said he is optimistic that new sites can be approved and opened in the coming decade. It takes three to five years to complete that process, he said. But given that lead time and other uncertainties of the siting process, it is prudent for utilities to plan for the worst case and be prepared to store waste on site for five to 10 years, he advised.

Levin reported on progress in four studies being conducted by DOE on low level waste projections for the 1980s. In 1979, commercially operated low-level waste disposal facilities received 2.8 million cubic feet of waste, while DOE sites received some 1.5 million cubic feet, he said. The bulk of the commercially generated waste, nearly 80 percent, goes to the Barnwell, S.C., site and the remainder is divided between Hanford, Wash., and Beatty, Nev.

Fully half of the waste is generated from commercial nuclear power plants, Levin reported. Most of the low level waste comes from eastern states, he added, yet Barnwell is the only eastern disposal site in operation.

Disposal Site Squeeze

The Barnwell site gradually is reducing the amount of waste it will accept for disposal, Levin said. That decision will put more pressure on the Beatty and Hanford sites. In 1982, the Barnwell facility will accept only 1.2 million cubic feet of waste.

Previous DOE estimates have put the low-level waste generation rate in 1990 at 11 million cubic feet, Levin said. At that rate, 10 sites the size of Barnwell will have to be in operation, each accepting 1.2 million cubic feet, he explained.

Levin said he believes adequate disposal sites can be found and approved to handle that volume of waste. The six-site network that existed in the early 1970s is a good model on which to build, he suggested. Besides Barnwell, Beatty, and Hanford, that network included sites at Sheffield, Ill., Maxey Flats, Ky., and West Valley, N.Y.

Levin praised the efforts of some states and utilities to speed up the siting of disposal sites. A potential squeeze in availability of disposal sites is recognized by those officials, he said. Most of the sites probably will be located in eastern states, near the waste generation sites, he predicted.

The potential squeeze on existing disposal sites and a need to insure adequate electric power are combining to force states to confront the low-level waste disposal issue. John J. Stucker, executive director, State Planning Council on Radioactive Waste Management, outlined some progress toward siting state and regional disposal facilities.

Legislation enacted by Congress last year orders the states to provide capacity for disposal of low-level wastes generated within their borders, he noted. The law also authorizes states to enter into compacts with neighboring states for regional sites. Preliminary discussions about such regional compacts already are under way in New England, the Midwest, Southeast, and West, he reported.

To assist the states, the State Planning Council is working on a model interstate compact for low-level waste disposal, Stucker said. It likely will be a few years, however, before any new sites are opened under the authority of an individual state or multi-state compact, he cautioned. The Nuclear Regulatory Commission could facilitate such work by establishing uniform, national standards for the states to follow, he suggested.

THE CHARLOTTE NEWS

Jan. 28, 1981

Dripping water not 'hot'

A truck loaded with low-level radioactive waste headed for South Carolina gave officials a scare Tuesday night when it appeared at a toll booth near Newburg, Md., dripping liquid from its load. But the liquid turned out to be non-radioactive water, and state officials let the truck go on its way.

The driver, Darryle S. Thompson of Midland, said the truck was headed for the nuclear waste dump at Barnwell, S.C.

Jan. 6, 1981

States discuss wastes

*S.C. wants help
with disposal*

COLUMBIA, S.C. (AP) — Representatives of nine Southeastern states agreed Monday to try to establish a pact to handle burial of low-level nuclear waste.

The agreement came during a meeting in Columbia arranged by Gov. Dick Riley. It was the first such gathering in the nation to discuss forming agreements under a new law passed by Congress last month.

David Reid, Riley's energy aide, said Virginia and Kentucky may make an agreement between themselves and with other states, not including South Carolina.

Other states represented in the Columbia meeting were North Carolina, Alabama, Georgia, Tennessee, Florida and Mississippi.

The meeting also included state and federal officials and representatives of Chem-Nuclear Systems Inc., operators of the site near Barnwell, S.C., where most low-level nuclear waste from the eastern United States is buried.

Riley told representatives that backup sites must be designated because South Carolina cannot serve indefinitely as the South's nuclear waste burial ground.

"Any state that feels that because South Carolina has a site, South Carolina is the answer to the region's problems ... is not looking at the entire situation," Riley said.

The governor said all states in the region must contribute if they decide to form a compact for handling low-level waste.

"No area is ... immune from sharing in that responsibility," Riley said. "This is a multistate effort and if everyone contributes, then no one will have a dangerous, undesirable situation."

He said the states must designate a second and possibly a third site as backups for waste disposal when the Barnwell site reaches capacity.

The federal law says each state is responsible for the safe handling and disposal of low-level waste within its boundaries. But it also allows states to enter regional agreements for handling slightly radioactive materials generated by hospitals, laboratories, nuclear power plants and other producers.

The law also gives states like South Carolina power to forbid other states from sending wastes to burial grounds within their borders.

Reid said the state representatives agreed to meet again about March 1.

Jan. 6, 1981

States To Pursue Regional Pact

By CLARK SURRATT
Governmental Affairs Editor

Representatives of nine southeastern states agreed Monday to pursue on a formal basis the establishment of an interstate compact to handle burial of low-level nuclear waste.

The Columbia meeting was arranged by Gov. Dick Riley and is the first such gathering in the nation to discuss forming compacts under an authorizing law passed by Congress last month.

David Reid, Riley's energy aide, said participants agreed to go back to their states

and secure the formal authorizations necessary to work toward a multi-state pact. Authorizing legislation by each participating state is required, along with an act of Congress, to ratify a compact.

"We agreed that as soon as possible each state ought to come back in a formal way, empowered to suggest legislation to form a compact," Reid said.

Two of the states represented Monday, Virginia and Kentucky, might not end up in a compact that would include South Carolina.

Reid said Virginia is hosting a meeting of its own to talk with some other states and that

Kentucky might ultimately be one of the states to form a compact with Virginia.

Other states represented in the Columbia meeting were Alabama, Georgia, North Carolina, Tennessee, Florida and Mississippi.

The meeting also included state and federal officials and representatives of Chem-Nuclear Systems Inc., operators of the burial ground near Barnwell where most of the low-level nuclear waste from the eastern part of the nation is now buried.

Low-level nuclear wastes are those less toxic radioactive materials generated by hospitals, laboratories, industries and power plants.

On Nuclear Waste

As he has preached for months, Riley told the representatives prior to the meeting that other states shouldn't depend on South Carolina to handle all their wastes indefinitely just because this state already has an operable burial site.

"No area is, nor should any area be, immune from sharing in that responsibility," said Riley. "This is a multi-state effort, and if everyone contributes, then no one will have a dangerous, undesirable situation."

Any state that feels that just because South Carolina has a site, South Carolina is the answer to the region's problems is not looking

at the entire situation," the governor said.

The new federal law makes each state responsible for disposing of its low-level nuclear wastes, including a veto power effective in 1985 on importing wastes from other states. But the law also allows for multi-state agreements on disposing of wastes.

Reid said the group did not get into the prospects of forming a compact to handle chemical and other hazardous wastes.

He said the state representatives agreed to meet again about March 1.

"Gov. Riley will notify each state's governor of our decision to proceed in a more formal manner," Reid said after the meeting.

Jan. 7, 1981

9 southeastern states OK pact on nuclear waste

COLUMBIA (AP) — Nine southeastern states have tentatively agreed to form a compact to handle disposal of low-level nuclear waste.

The state officials attended a meeting in Columbia hosted by Gov. Dick Riley on Monday. They agreed to meet again about March 1.

South Carolina currently has the only nuclear waste disposal site in the East in Barnwell. But Riley warned the other officials not to expect this state to shoulder that burden forever.

"Any state that feels that because South Carolina has a site, South Carolina is the answer to the region's problems ... is not looking at the entire situation," Riley said.

The meeting was the first in the nation to discuss forming interstate compacts under a new law passed by Congress last month.

David Reid, an aide to Riley, said representatives of the states agreed to return to their states and seek authorizations to work toward a regional pact.

Two states, Virginia and Kentucky, might opt for another compact, he said. Virginia is holding a meeting to talk with other states and Kentucky might enter the Virginia compact, Reid said.

Other states represented at the meeting were Alabama, Georgia, North Carolina, Tennessee, Florida and Mississippi.

Federal officials and representatives of Chem-Nuclear Systems Inc., operators of the Barnwell disposal site, also attended the meeting.

Riley said that all states in the region must participate if they decide to form a compact. "No area is ... immune from sharing in that responsibility," Riley said. "This is a multi-state effort and if everyone contributes, then no one will have a dangerous, undesirable situation."

ISLAND PACKET, Hilton Head Island, S.C.

Jan. 8, 1981

Nuclear waste discussed

COLUMBIA—Representatives of nine Southeastern states agreed Monday to pursue on a formal basis the establishment of an interstate compact to handle burial of low-level nuclear waste.

The Columbia meeting was arranged by Gov. Richard Riley and is the first such meeting in the nation to discuss forming compacts under an authorizing law passed by Congress last month. David Reid, Riley's energy aide, said participants agreed to go back to their states and secure formal authorization necessary to work toward a multi-state pact.

Also sitting in at the meeting were representatives from the S.C. Department of Health and Environmental Control and Chem-Nuclear Inc., which operates the only low-level nuclear waste storage facility east of the Mississippi River.

As he has preached for several months, Gov. Riley told the representatives prior to the meeting that other states shouldn't depend on South Carolina to handle all their wastes indefinitely just because this state has an operable burial site.

Jan. 24, 1981

The Nuclear Waste

EDITORIAL

New ideas, policies and perspectives are anticipated in the area of energy planning with the new Reagan administration coming on board.

Former S.C. Gov. James B. Edwards, selected by Reagan to head the U.S. Department of Energy, has taken a strong stand in favor of nuclear power, as has Reagan.

Most of those knowledgeable in that field are in agreement that the major problem with regards to nuclear power is not the danger from the power plants as much as from disposal of their radioactive wastes.

U.S. Sen. Ernest F. Hollings, R-S.C., recently said what is needed out of the federal government is a decision on permanent storage. Then planning can move into the areas of solidification and removal of temporary stored waste in South Carolina to its permanent spot.

Other than that, nuclear energy is safe and it's needed, especially if we are going to continue to compete in this world from an industrial standpoint, Hollings said.

We agree with Hollings, and we hope that under the new administration and the leadership of

former Gov. Edwards, this type planning will finally be accomplished.

Nuclear energy and nuclear waste became an especially heated issue while President Carter was in office. As the issue grew political in its orientation and consequences, planning and decision-making regarding permanent disposal of nuclear wastes all but ground to a halt.

Meanwhile the wastes continued to stockpile, much of it in South Carolina.

S.C. Gov. Dick Riley and others have taken a strong stand against the rest of the nation using this state as a nuclear dumping ground, especially as long as there are no plans for taking care of the waste in a permanent way.

Already steps are being taken to improve the situation, and announcements have been made that nuclear reprocessing will probably be allowed at the facility near Barnwell.

We urge continued planning and action to take care of the nuclear waste problem. Political consequences have been the determining factor in that issue for far too long.

Jan. 8, 1981

Conservation Award Winners Named

The South Carolina Wildlife Federation has selected Governor Richard Riley as its 1980 Conservationist of the Year in recognition of his leadership in nuclear waste management.

"Governor Riley has been, in many cases, a lone voice in a long campaign to secure from Congress a sensible, comprehensive national policy for handling and disposal of low and high level nuclear waste and also hazardous industrial waste," said Federation President A. Mitchell Godwin of Conway in making the announcement. "Because of his efforts, the nation is recognizing the dimensions of the problem and is working towards a solution."

Other award winners selected for recognition were John Evans of Columbia, Communications; Brice Lathan of Sandy Springs, Education; Herman Hermelink of Charlotte, N. C., Forest; Charlie Snider of Anderson, Hunter Safety; S. C. Electric and Gas, Hydro and Environmental Engineering, Industrial; Elizabeth Lever of Columbia, Land; Ecological Services Office, Region 4, U. S. Fish and Wildlife Service at Charleston, Organization; Hubert E. Yarborough of Greenville, Water; Dr. James A. Timmerman, Jr. of Columbia, Wildlife; Heather Meeds of Summerville, Youth; Nancy D. Cathcart of Hilton Head, special posthumous award, Anne Worsham Richardson of Charleston, special award.

The South Carolina Wildlife Federation's award program recognizes individuals and groups for outstanding conservation efforts. Presentations will be made at the Federation's Conservation Achievement award banquet Feb. 28, 1981 at the Myrtle Beach Sheraton."

Jan. 7, 1981

Smith says delegation alert to nuclear dumping dangers

ASLEY — Senator Harris P. Smith in response to a request that the Pickens county representatives keep abreast of nuclear waste disposal plans pledged the delegation efforts to "see that South Carolina doesn't become a nuclear dumping ground. His pledge was made during Saturday's annual delegation picnic forum.

held at Easley City Hall the meeting acted a full house — probably 35 to 40 persons — an attendance somewhat larger than in recent years.

Ernie Holt, of Clemson, who made request asked the question: "What's worse than being the country's largest level nuclear waste landfill?" and answered with "Becoming the only commercial high level nuclear waste

dump."

She read a prepared statement which pointed out:

"Barnwell's Allied General Nuclear Services (AGNS) may very well become the only commercial reprocessing plant in the entire U.S. It doesn't take a vivid imagination to visualize the thousands of spent fuel casks rolling across the U.S. Highways to Barnwell.

"South Carolina reactors alone will have hundreds of shipments of highly irradiated rods by the time AGNS is retrofitted with the latest reprocessing technologies. (During the reprocessing itself, stack emissions may pose a very serious environmental and health problem). After reprocessing the recovered uranium and plutonium will

again be shipped over South Carolina highways to fuel fabrication plants, possibly the planned Westinghouse plant near Anderson, and on to reactors.

"The remaining debris — millions of gallons of chemical and radioactive liquid wastes — will stay at Barnwell just as the 25 million gallons of liquid wastes are still at Savannah River Plant, until a disposal method is perfected and a burial site agreed upon.

"Reprocessing is not disposal. Reprocessing does not solve the waste problem. Let's don't hold our breath in South Carolina until another state will take these wastes.

"Another serious possibility is that the federal government will purchase AGNS. With the Department of Energy

ownership we give up our state's rights, the governor's veto power and bargaining power and the taxes the state should realize from private enterprise.

"On the other hand if reprocessing fails as it did in West Valley, N.Y. the state of South Carolina is left holding the bag," Mrs. Holt emphasized, noting that "unanswered questions surrounding nuclear wastes will go on and on."

Delegation members, Sen. Smith, Reps. Ed Simpson, Larry Martin and B. L. Hendricks and Sen. Alex Macaulay of Oconee County, who also represents the senatorial district were present.

Macaulay told the group that he would be receptive to suggestions and is looking forward to serving all the people of Anderson, Abbeville, Oconee and

Pickens counties.

Senator Smith one of the biggest issues facing the General Assembly (which opens Jan. 13) is fiscal problems and finding revenues to meet the \$37 million shortfall. The 7 percent cutback in personnel on a statewide basis was made to solve the shortfall situation, he said, but the Department of Corrections will be opening much needed facilities and these will cost money to staff and operate.

Smith listed other problems facing the legislature as auto liability insurance, broadening the base of revenue for local government which currently depends on property tax, a permanent solution to the highway department's financial bud, the appellate court and the struggle between the judiciary and the legislature, and

reapportionment of six congressional districts as a result of the new census count. County council will have to reapportion its district to try to attain a population count of around 13,304 each, but the legislature won't be involved in this matter, he said.

Agreeing with Smith's list of major issues facing the legislature Rep. Hendricks commented on the reassessment of property on a statewide basis and expressed the opinion that it will be more effective than it has been in the past. He said he would fight to reinstate cutback of funds for the Department of Social Services, Mental Health and State Corrections because these are

Continued on Page 2

services needed in a time of declining economy. The state corrections facilities will need personnel to staff and this will mean more finances, he said.

Rep. Simpson noted that the state has given in too easily in the past on the matter of nuclear waste disposal in the state and said it is time to take political action to see that South Carolina doesn't become a national dumping ground.

Simpson said that he still hopes to get a bottle bill passed and that states which have them report conservation of energy and raw materials and a net increase in jobs. He said he would support a proposed change in the driving age from 15 to 16 years of age.

Rep. Martin said he agreed with the other members that some departments could be cut 7 percent on personnel with no great hardship and that adjustments should be made in the budgets of those which render a vital public service like DSS and the Department of Corrections. He said he feels that legislation will be introduced to increase the sales tax from 4 to 5 cents and that new bills will be presented on auto insurance. Martin said that he favored basing insurance rates on driving records.

During the question-answer period Earl Martin demanded to know whose fault it is that the state all of a sudden doesn't have adequate prison facilities.

Rep. Hendricks explained that when the state took over local prisoners the problem mushroomed overnight and that stop gap measures were taken through parole for persons eligible for it.

Sen. Smith said that many departments are fighting for larger appropriations that everyone doesn't get what they need as was the case with the department of corrections until it became an emergency situation and something had to be done.

Martin kept hammering away with questions: Why was the library discarding books such as the one by J. Edgar Hoover against communism? Why are so many Clemson University cars seen on the highway with just one rider?

To the library book question, the delegation explained that it has no authority on the selection or disposal of books and as to the Clemson University cars traveling with one rider, Sen. Smith said that he had checked a number of times and learned that the operators of the cars were going to different points in the state.

Bill Watson put in a word for "younger boys" requesting that they not be penalized with higher rates because of their age. He emphasized that it is discrimination because girls of the same age don't have to pay the higher rates.

Watson begged the delegation to "obey the 55-mile law" while they are in the legislature and warned "better pass your laws this year, next year is voting time."

Regarding a question on whether the delegation would go along with a proposal by the school finance study commits to give the school district fiscal autonomy, Sen. Smith said that the delegation has not received a recommendation from the committee. That recommendation is due by Feb. 1.

A resident of Dacusville said "I don't feel the school board should have fiscal autonomy. We need to take away what it has and consolidate the two school offices."

He suggested a referendum on an elected or appointed superintendent. Currently the district has an appointed superintendent of schools and an elected school board and an elected superintendent of education and an appointed school board. The elected school board receives no pay, the appointed board does.

Jan. 21, 1981

Safe disposal first priority

By PHYLLIS M. JOHNSON
Rt. 10

Radioactive garbage has been piling up in the United States for over 35 years.

Thirty-three years ago, according to a retired Navy pilot, atomic wastes were dumped in the Atlantic, and the missions later erased from Navy flight logs. Today we still have no national plan for the disposal of high-level wastes, and no consensus on what constitutes safe disposal.

Meanwhile 25 million gallons of high-level wastes are accumulating in temporary storage tanks at the federal nuclear weapons fuel plant on the Savannah River. Yet, this newspaper calls for activating the nuclear fuel reprocessing plant at Barnwell. Only second does The Greenville News turn to the problem of high-level waste management.

Reprocessing extracts uranium and plutonium from spent fuel; it does not significantly reduce the amount of high-level waste from spent fuel. If Barnwell is opened as a reprocessing plant, South Carolina would receive a backlog of used reactor fuel from all over the country.

The high-level wastes remaining after reprocessing would be stored at Barnwell until a permanent burial site is opened. Such a site will probably not be opened until at least the mid-1990s.

Some of the "low-level" wastes South Carolina already stores are highly radioactive and hazardous. Low-level wastes are classified by their source not their degree of radioactivity.

It is time to come to a screeching halt. Only when the riddle of safe, permanent nuclear waste disposal has been solved, should reprocessing be considered. South Carolina already shoulders too heavy a waste burden as the result of a splintered nuclear waste policy.

States To Pursue Regional Pact On Nuclear Waste

By CLARK SERRATT
Environmental News Editor

Representatives of nine southeastern states agreed Monday to pursue on a formal basis the establishment of an inter-state compact to handle burial of low-level nuclear waste.

The Columbia meeting was arranged by Gov. Dick Riley and is the first such gathering in the nation to discuss forming compacts under an authorizing law passed by Congress last month.

David Reid, Riley's energy aide, said participants agreed to go back to their states

and secure the formal authorizations necessary to work toward a multi-state pact. Authorizing legislation by each participating state is required, along with an act of Congress, to ratify a compact.

"We agreed that as soon as possible each state ought to come back in a formal way, empowered to suggest legislation to form a compact," Reid said.

Two of the states represented Monday, Virginia and Kentucky, might not end up in a compact that would include South Carolina.

Reid said Virginia is hosting a meeting of its own to talk with some other states and that

Kentucky might ultimately be one of the states to form a compact with Virginia.

Other states represented in the Columbia meeting were Alabama, Georgia, North Carolina, Tennessee, Florida and Mississippi.

The meeting also included state and federal officials and representatives of Chem-Nuclear Systems Inc., operators of the burial ground near Barnwell where most of the low-level nuclear waste from the eastern part of the nation is now buried.

Low-level nuclear wastes are those less toxic radioactive materials generated by hospitals, laboratories, industries and power plants.

As he has preached for months, Riley told the representatives prior to the meeting that other states shouldn't depend on South Carolina to handle all their wastes indefinitely just because this state already has an operable burial site.

"No area is, nor should any area be, immune from sharing in that responsibility," said Riley. "This is a multi-state effort, and if everyone contributes, then no one will have a dangerous, undesirable situation."

Any state that feels that just because South Carolina has a site, South Carolina is the answer to the region's problems is not looking

at the entire situation," the governor said.

The new federal law makes each state responsible for disposing of its low-level nuclear wastes, including a veto power effective in 1985 on importing wastes from other states. But the law also allows for multi-state agreements on disposing of wastes.

Reid said the group did not get into the prospects of forming a compact to handle chemical and other hazardous wastes.

He said the state representatives agreed to meet again about March 1.

"Gov. Riley will notify each state's governor of our decision to proceed in a more formal manner," Reid said after the meeting.

GOVERNORS' BULLETIN
(National Governors' Association)

Jan. 2, 1981

**PRESIDENT SIGNS NUCLEAR WASTE BILL,
GENERAL REVENUE SHARING EXTENSION**

President Carter has signed into law bills that clear the way for states to develop a solution for the disposal of low-level radioactive wastes and that extend the general revenue sharing program through fiscal 1983.

Enactment of the nuclear waste disposal bill, which is based largely on recommendations from the nation's governors, will enable states to provide for the safe disposal of low-level radioactive wastes generated through such activities as scientific research and medical procedures, according to Arizona Gov. Bruce Babbitt.

Babbitt said that radiological research and medicine nearly came to a halt in 1979 when the governors of Nevada, South Carolina and Washington restricted access to the nation's only commercial low-level waste disposal sites. The governors' actions followed the consistent failure of waste generators to properly package and transport their wastes and the subsequent failure of several federal agencies to adequately enforce waste packaging and transportation regulations and impose proper sanctions. Also at issue was the unwillingness of the three states to continue to serve as the only disposal sites for the rest of the nation.

To address those problems and come up with a plan for dealing with the expected increase in the volume of medical, scientific and defense-related low-level waste (the nation is expected to generate 321,000 cubic meters of low-level waste by 1990, compared with 99,000 cubic meters in 1980), the National Governors' Association created a task force, chaired by Babbitt, to study the problem and suggest solutions.

Babbitt said the bill signed by the president "includes the major recommendations of our task force--that each state be responsible for the wastes generated within its borders, that regional compacts among states offer the most promise for an equitable solution, and that these regional

groupings be allowed to exclude wastes generated from outside the region." Authority to exclude waste generated from other states must be granted by Congress because of the constitutional prohibition on interference in interstate commerce.

Dec. 31, 1980

Andy Plattner

Nuclear waste progress

Andy Plattner is a writer for Congressional Quarterly, a non-partisan news research service.

WASHINGTON — Congress has decided to give the states the responsibility for burying low-level radioactive trash. But it adjourned without deciding what to do about high-level nuclear waste or the mounting quantities of radioactive spent fuel burned by the nation's nuclear reactors.

Although radioactive garbage has been piling up in the United States for over 35 years, Congress had never developed a national policy for dealing with it. When it did finally pass its first nuclear waste bill in the last days of the recent session, it dealt with only one part of the problem — contaminated trash from hospitals, industries and power plants that use radioactive materials.

Efforts to pass a more comprehensive bill fell apart because key senators could not agree on how much say state governments should have — if any — over the burial of military waste within their borders.

Low-level wastes include radiation-contaminated paper, plastics, construction materials, tools, protective clothing, vials, solutions and industrial waste. They are generated in every state.

Some experts object to the term "low-level," saying it erroneously implies that these wastes are not dangerous, when in fact, some are highly radioactive and hazardous. The classification is not based on the degree of radioactivity, but the source. Basically, all radioactive waste not produced in nuclear reactors or in the reprocessing of nuclear fuel is considered low-level.

Under the bill that was passed, each state will be forced to deal with the problem of burying low-level wastes. States can build their own dumps or form regional compacts to establish mutual sites, the option most are expected to choose.

After 1985, regional groups will be permitted to exclude waste from states that don't join the compact.

The federal government will continue to bury its own considerable production of nuclear garbage. The regional compacts could not make policies affecting federal waste, which comes mostly from making atomic weapons.

The only states with dumps where low-level nuclear waste can be buried now are Washington, Nevada and South Carolina, and they're getting tired of accepting the entire nation's output.

Washington residents voted Nov. 4 to close the disposal site at Hanford to out-of-state nuclear garbage starting next summer. The governor of Nevada has vowed to close that state's dump at Beatty. And South Carolina Gov. Richard W. Riley, whose state accepts the bulk of the nation's radioactive trash, has said it will accept less of it in the future.

Nuclear waste legislation appeared dead in the waning days of the 96th Congress, until Riley's office let it be known that the governor was considering closing the Barnwell, S.C., dump to out-of-state waste if Congress did not pass at least the low-level portion of the bill.

Riley's ally in Congress, Rep. Butler Derrick, D-S.C., put together an unusually forceful effort to secure passage of the low-level waste provisions in the midst of Congress' end-of-session debate.

Derrick camped on or just off the Senate floor for more than nine hours on a Saturday, grabbing key senators, persuading them that the low-level portion of the bill was needed. The Senate passed it that afternoon, and the House followed suit a few hours later. Without Derrick's persistence the measure would not have been passed, according to others who were involved.

Derrick said senators were "a little startled" at seeing a member of the House on the wrong side of the Capitol, but "that's where they were, so that's where I went."

The legislation was supported by medical groups and state government organizations. Without it, the

National Governors Association warned, the low-level waste problem could rapidly lead to a crisis situation affecting almost every community in the United States.

While the nuclear industry, the utility lobby and the Carter administration were not unhappy to see the enactment of the low-level waste bill, they were disappointed with Congress' failure to set a national policy for the disposal of high-level wastes and spent nuclear fuel.

A bill passed by the Senate in July called for temporary storage of highly radioactive waste in monitored vaults near the earth's surface. It also provided for federal storage of spent fuel from commercial nuclear reactors.

In early December, the House passed a much different bill. It called for permanent waste storage repositories in natural rock formations, which environmental groups said would be safer than temporary vaults. And it did not provide for federal storage of spent fuel, which environmentalists attacked as a bailout of the nuclear industry.

Following passage of the House bill, repeated efforts were made to find a compromise, but the issue of state power over military nuclear waste proved irreconcilable.

Sen. Henry M. Jackson, D-Wash., chairman of the Senate Energy Committee and a powerful member of the Senate Armed Services Committee, demanded that the legislation specifically exclude military nuclear waste facilities. Jackson wanted the states prohibited from raising objections to military waste sites within their borders.

However, Sen. John Glenn, D-Ohio, insisted on giving the states the right to oppose any nuclear waste site, military or civilian, subject to congressional review.

More than half of all radioactive waste has been generated by the military, Glenn said, and "we just can't sweep it under the rug. It is just as much a hazard to the public" as commercial waste.

Dec. 16, 1980

S.C. will let U.S. share waste site

COLUMBIA, S.C. (AP) — The U.S. Department of Defense has become the first and only federal agency authorized to send its low-level radioactive wastes to the Chem-Nuclear Systems Inc. dump in Barnwell, S.C.

Gov. Dick Riley announced Monday that an agreement was reached between the Pentagon and the state of South Carolina to allow the Defense Department to send slightly radioactive wastes to the Barnwell dump.

In the past the only Defense Department wastes allowed into South Carolina went to the Savannah River Plant, a privately operated Department of Energy facility, also near Barnwell.

The Chem-Nuclear disposal site, located on state land, is the only dump on the East Coast licensed to accept low-level wastes. It is one of just three such dumps in the nation. The others are in Nevada and Washington state.

Riley, in a statement, said the agreement with the Pentagon was similar to one negotiated two months ago with DOE. Both agreements for the first time require the federal agencies to give state officials advance notice of their plans to ship and store wastes.

The governor said the agreement with the Pentagon was reached voluntarily in order to avoid a possible legal conflict over a 1980 state law regulating radioactive waste transportation and disposal.

Riley said the basic difference between the agreement and the new state law is that the Department of Defense will not need a state permit for waste transportation.

However, the state may take "reasonable corrective action, including suspension or revocation of disposal privileges."

Defense department agrees to give advance warning of nuclear waste shipments

By The Associated Press

COLUMBIA — The U.S. Department of Defense has become the first and only federal agency authorized to send its low-level radioactive wastes to the Chem-Nuclear Systems Inc. dump in Barnwell.

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In the past the only Defense Department wastes allowed into South Carolina went to the Savannah River Plant, a privately operated Department of Energy facility, also near Barnwell.

The Chem-Nuclear disposal site, located on state land, is the only dump on the East Coast licensed to accept low-level wastes. It is one of just three such dumps in the nation. The others are in Nevada and Washington state.

Riley, in a statement, said the agreement with the Pentagon was similar to one negotiated two months ago with DOE. Both agreements for the first time require the federal agencies to give state officials advance notice of their plans to ship and store wastes.

The governor said the agreement with the Pentagon was reached voluntarily in order to avoid a possible legal conflict over a 1980 state law regulating radioactive waste transportation and disposal.

The law requires that anyone who plans to ship or dispose of nuclear wastes in South Carolina first receive transportation and disposal permits from the state and also give state health officials advance notice of planned shipments.

However, federal officials questioned whether a state law could constitutionally be applied to federal shipments. That question led to the voluntary agreements two months ago with DOE and this month with the Pentagon.

Riley said the basic difference between the agreement and the new state law is that under the agreement the Department of Defense will not need a state permit for waste transportation.

However, the agreement says that if the department violates packaging and transport regulations, the state may take "reasonable corrective action, including the suspension or revocation of disposal privileges" for the Chem-Nuclear site.

The Defense Department has agreed to let the state Department of Health and Environmental Control know in advance of its plans to ship wastes to the Chem-Nuclear

The agreement says that if the department violates packaging and transport regulations, the state may take 'reasonable corrective action, including the suspension or revocation of disposal privileges' for the Chem-Nuclear site. Wastes 'under escort for the purpose of national security or defense' will not be covered by the agreement.

site or the Savannah River Plant.

Shipments to the Savannah River Plant will not be significantly affected by the agreement. All it says is that if a serious or recurring irregularity in packaging or loading is found at SRP, the governor "may then notify the Under Secretary of Energy who will review the matter and advise him."

Defense Department wastes "under escort for the purpose of national security or defense" will not be covered by the agreement.

The principles were negotiated by Riley aide Elliott D. Thompson and Defense Department officials. James P. Wade Jr., assistant to the secretary of defense for atomic energy, in a letter to Riley noted that Thompson "has negotiated with our staff to resolve the complex issues surrounding the transportation and disposal problem. I am pleased with the solution we have reached."

Riley returned a signed copy of the principles to Wade with a cover letter noting that no consideration was given to away-from-reactor storage of spent fuel, commercial reprocessing or high-level waste shipments in South Carolina.

The governor said in the letter he was "extremely pleased" with the agreement.

In his statement Riley said, "I continue to be concerned with protection of the public health and safety in matters of this nature and believe the Department of Defense, through this agreement, has recognized its responsibilities for the safe transportation of nuclear waste."

Frantic Push Of Waste Bill Is Successful

*Law Could Reduce
Dumping In S.C.*

By ROBERT HODIERNE
Observer-Writer

WASHINGTON — Faced with what seemed to be imminent adjournment, Congress passed a bill Saturday that could end South Carolina's role as the country's leading dumping ground for low-level nuclear waste.

The bill passed the Senate on an unrecorded voice vote after only 20 minutes of debate. It took even less time to pass unanimously in the House, where there wasn't even a vote.

In public, it all looked easy. But the behind-the-scenes action leading to passage was frenetic. At times, Rep. Butler Derrick, D-S.C., the bill's major pusher, sprinted back and forth from the Senate to the House past astonished tourists.

As late as Thursday afternoon, the bill's key supporters believed it dead.

Its resurrection provides a glimpse into how the legislative process really works — and it's not exactly the tidy explanation offered in civics books.

Currently, only three sites in the nation store mildly radioactive wastes — in Washington State, Nevada and Barnwell, S.C. The Barnwell site gets 75 percent of the waste.

The bill passed Saturday would make each state responsible for disposing of its own low-level radioactive waste and says states may enter into agreements with neighboring states to create dumps.

For South Carolina, the practical effect is that it will now only have to accept waste from states in the Southeast, as opposed to states all over the country.

Derrick said the measure was important because the radioactive material is "toxic, it's buried in our state, they're just piling it up and piling it up. Who knows what could have happened?"

All year, Congress has wrestled with the problem of nuclear waste, including low-level radio-

Derrick

Frantic Push Of Waste Bill Is Successful

Continued from Page 1C
active waste and the more controversial high-level radioactive waste, which includes spent fuel from reactors.

The Senate and House, however, couldn't agree on a bill dealing with both kinds of waste. Sen. Henry Jackson, D-Wash., chairman of the Senate Energy and Natural Resources Committee, provided the major stumbling block.

Originally, both kinds of nuclear waste were to be covered by one bill, and one of the most controversial sections of that bill would have allowed states some veto power over the creation of a high-level waste storage site.

Jackson, a strong backer of the Pentagon, didn't want to allow states to prohibit the storage of defense-created waste — leftovers from the nuclear weapons industry — within their boundaries.

By last Thursday it appeared no compromise could be found that would satisfy Jackson.

But late Thursday afternoon, Derrick decided to see if a bill dealing with only the less controversial low-level waste could be passed.

Derrick spoke to Rep. Morris Udall, D-Ariz., chairman of the House Interior Committee, and Rep. Charles Dingell, D-Mich., chairman of the House Energy and Power subcommittee, whose approval is essential for any waste legislation.

Udall had no problem with Derrick's proposal, but Dingell, before he gave up on the comprehensive bill, wanted to be sure it was a hopeless effort.

While Dingell tried to contact Jackson, Derrick was lining up help from South Carolina's senators, Republican Strom Thurmond and Democrat Ernest Hollings, who would be needed to fight for the bill in the Senate.

At 3:30 p.m. Friday, Dingell called Derrick with bad news: Jackson would not allow any waste disposal bill to come up, even the low-level bill. Dingell said Jackson was worried the bill would allow states to bar military nuclear waste.

But Derrick's proposal specifically excluded military waste.

"I couldn't freely move until Dingell released me," Derrick said. "When he thought the (comprehensive) bill was dead, he turned me loose."

A Derrick aide recalled, "He stood up, grabbed the bill and said, 'I'm going to find Sen. Jackson.'"

Derrick and Hollings reached Jackson by phone Friday night and persuaded him the low-level bill would not harm the military.

Jackson withdrew his objection.

Saturday morning, shortly after midnight, Derrick was awakened at home by a phone call from Dingell. Dingell was incredulous that Derrick had been able to win over Jackson. "You must have some sort of miracle power," Dingell told him.

By now, however, Congress was nearing adjournment. And it turned out an unexpected number of senators opposed Derrick's bill, apparently confusing it with the controversial bill dealing with the high-level nuclear waste.

Friday night and Saturday, Derrick spent more time roaming through the Senate chamber — hunting for senators to persuade — than on the House side.

Shortly after 4 p.m. Saturday, Derrick had found each of the half-dozen senators who had put a "hold" on the bill. Normally, such a hold can only stop action on a bill for several days and isn't fatal to bill. But with only hours remaining in the session, even a temporary hold could have killed the bill.

The only remaining significant legislation before Congress was a stop-gap spending bill. Once both the House and Senate agreed upon that bill, Congress would be over.

By 4 p.m. Saturday, the House had finished its work on the spending bill and sent it to the Senate. At 4:20 p.m., in the Senate, Sen. James McClure, R-Idaho, who will chair the Senate Energy Committee next year, introduced Derrick's bill.

Twenty minutes later, on a voice vote, the bill passed the Senate.

Derrick, who had been sitting beside Thurmond in the chamber, dashed to the House chamber to inform Udall, so the bill could be introduced in the House.

It took Derrick three more trips back to the Senate before he could get an official, signed copy of the bill delivered to the House. The bill was delivered at 7 p.m. and with only the most perfunctory debate, it was passed by "unanimous consent," which means no members present objected.

Derrick was rushing to avoid what all thought was the imminent end to this Congress. But Saturday evening Congress stalled over the question of a \$10,000-a-year pay raise Senate decided to return Monday morning.

Meanwhile, an exhausted Derrick returned to his office, where he shared bottles of champagne with his staff.

While many of his fellow legislators were praising Derrick, none was more effusive than the usually gruff Dingell, who had written off any chance of passing the bill. "But for this guy, you folks wouldn't be within shouting distance of solving this this year," he said.

Dec. 11, 1980

S.C. may bar nuclear waste till issue settled

COLUMBIA, S.C. (AP) — Gov. Dick Riley may bar all low-level nuclear wastes from South Carolina, if Congress doesn't pass nuclear waste storage regulations.

Last year, Riley clamped down on the amount of low-level radioactive waste that could be brought in, but a dump operated by Chem Nuclear Services Inc. near Barnwell still gets about half the waste generated in the nation.

There is no other storage facility on the East Coast.

A House-Senate conference committee has been wrestling

with a waste disposal bill since last week but has been unable to resolve a dispute over including high-level waste in regulations.

Rep. Butler C. Derrick, D-S.C., co-sponsor of the House version and a member of the conference committee, has been trying to get the questions of high-level and low-level disposal separated so the low-level portion might pass, according to Derrick aide Jean Neal.

Riley has been in frequent contact with Derrick, Ms. Neal said.

Riley's advisers have said con-

gressional inaction would leave South Carolina with the country's only major site for low-level nuclear waste disposal by next year and the governor might consider again halting all out-of-state shipments.

Alternatives the governor has, in case Congress fails to act, include further cutbacks but not a complete abolition on radioactive material allowed from other states.

"This would put the added pressure on other states like New York, New Jersey, Pennsylvania,

Ohio and Illinois to take positive actions now to create the desperately needed additional disposal capacity in this country," a memo from his staff said.

The memo also said South Carolina may back away from its decision to allow entry of any state's waste in limited amounts and restrict storage to material from Southeastern states only.

Congressional sources say the stalemate is over what to say about storage of military waste, which is considered high-level

radioactive material. Some senators don't want the point even mentioned in the bill, which as passed by the House would set a 1985 deadline for federal selection of two permanent disposal sites.

All factions agree, according to Derrick, that states should be able to get together to select a location for disposal of low-level waste from reactors and other sources in their borders, including such things as slightly radioactive gowns from hospitals and laboratories.

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Dec. 12, 1980

Riley Hints At Closing Nuke Dump

Gov. Dick Riley's staff, trying to send a strong signal to Washington, has mentioned in writing the prospect of closing the Chem Nuclear Systems site to low-level waste from other states.

The governor is not close to taking that action, a spokesman said, but is putting the option up for discussion to try to get Congress to pass a law calling for regional burial sites for low-level waste.

AS IT HAS for some time, the burial ground near Barnwell takes more of the nation's waste than any other location. Riley has been on a campaign for months to get other areas of the country to bury their fair share.

Prospects for the regional burial legislation do not look good for now, said Rep. Butler C. Derrick, D-S.C., sponsor of the bill. He has been pushing a compromise bill that also deals with several other nuclear issues.

He said if a House-Senate conference committee fails to agree on legislation, then he'll introduce the bill in the next session of Congress, though admitting it could be another five to six months before it passes.

AMONG OTHER STEPS, Riley aides suggested the governor consider keeping other states' low-level nuclear wastes from being shipped to

Riley Hints At Closing Dump

(Continued From 1-D)

Barnwell, the only such site in the east.

A year ago Riley sharply reduced the amount of low-level material that could be brought to the facility, but the site still gets about half that produced in the nation.

There are two storage sites in the west, in Nevada and Washington, which could be closed within months. Washington voters said in November that without federal legislation making other states responsible for their waste, its site should be closed.

Nevada's waste site is projected to be full in 1982.

Derrick said he would not favor a total ban on out-of-state waste but would support a further reduction in the amount permitted, another option suggested by Riley staffers.

A staff memorandum to the governor this week suggested that a complete ban "may be just what is needed to get the 'mule's' attention" — "the triggering mechanism" to get all states to accept responsibility for their own waste would be for states or groups of states to be able to exclude waste shipments.

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to material from southeastern states only.

All factions agree, according to Derrick, that states should be able to get together to select a location for disposal of low-level waste.

The House approved legislation last week that calls for the creation of interstate pacts to shift the responsibility from the three states to a regional basis.

One of the primary obstacles to agreement came from Sen. Henry Jackson, D-Washington, who did not want to grant states the power to reject their selection sites for waste generated from military arms production, said Derrick.

Dec. 4, 1980

House Votes Designated Permanent N-Waste Sites

By LEE BANDY

Washington Bureau

WASHINGTON — The House adopted legislation Wednesday to start designating permanent waste sites for disposal of high-level nuclear wastes and to establish a regional burial program for low-level material.

The measure, adopted by voice vote, was immediately sent to a conference with the Senate, which has approved a drastically different version including a \$300 million program for away-from-reactor spent fuel storage facilities.

Rep. Butler C. Derrick, D-S.C., author of the low-level provision in the House bill and a conferee, said he is confident Congress will have the legislation on President Carter's desk before adjourning Friday.

The low-level amendment was developed by Derrick in cooperation with Gov. Dick Riley. It specifically gives states authority to enter into regional compacts for the burial of low-level waste.

"This should lead to the creation of six or seven sites throughout the nation," Derrick told the House. "The sites would handle waste generated within a region. No one area of the country would bear the entire burden. The waste would remain within a limited area and not be transported across the nation."

Presently, there are only three low-level waste sites operating in the nation, in South Carolina.

(See HOUSE, 17-A, Col. 3)

House OKs N-Waste Storage

(Continued From 1-A)

na, Nevada and Washington. They handle such contaminated items as clothing, medical supplies used in nuclear medicine, tools and other materials from nuclear research laboratories.

The Chem Nuclear burial site near Barnwell receives the bulk of the contaminated material east of the Mississippi.

"Unless we provide leadership to solve the waste disposal problem," Derrick said, "we are quickly going to find this country without disposal sites for waste now being generated, much less for the future."

The Edgefield Democrat lobbied long and hard for the House bill. He had Riley calling state officials around the nation urging them to contact their congressional representatives.

Derrick said he worked with two committee chairmen, Rep. Morris K.

Udall, D-Ariz., of Interior and John Dingell, D-Mich., of the House energy subcommittee, to "pull every maneuver we could to get a solution to this politically sensitive issue."

Aside from the low-level provision, the House bill sets up a permanent repository for high-level waste by 1987.

"For 35 years, our country has been producing nuclear waste, yet we have yet to provide for the disposal of a single pound," Udall said.

"It's time we get on that job. What we can do in these next two or three days is make a beginning on some kind of sensible permanent waste disposal procedure."

States can veto a site within their borders under the House bill, but one chamber of Congress can override it.

Rep. Peter Kostmayer, D-Pa., attempted unsuccessfully to strengthen the state role by requiring both

houses to override a veto.

Opponents of that approach warned that the country would end up without any permanent disposal program because states, for political reasons, would be forced to say "no" to burial sites.

Rep. Clarence Brown, R-Ohio, called Kostmayer's amendment "an anti-nuclear wolf in sheep's clothing."

Derrick said later, in an interview, that he presently opposes an away-from-reactor storage program. He indicated that he would prefer to see utilities expand their on-site storage facilities at their nuclear power reactors and the nation move to reprocessing of spent fuel rods.

In endorsing a temporary spent fuel storage program, the Senate noted that several utilities had reached their on-site storage capacity and structurally cannot expand present facilities.

Such power companies, it said, would need an away-from-reactor storage capacity by 1983.

The Senate also noted that temporary storage makes spent fuel accessible for later reprocessing, a technology environmentalists are attempting to block.

Reprocessing produces plutonium which can be used in the manufacture of nuclear weapons.

Dec. 4, 1980

Nuclear waste bill gets House approval

By CHRIS WESTON
News Staff Writer

The U.S. House of Representatives approved legislation Wednesday designed to end South Carolina's role as the nation's chief storage site for low-level nuclear waste.

The bill, written and shepherded through the chamber by 3rd District U.S. Rep. Butler Derrick, now will go to a House-Senate conference committee which will work out differences between the House bill and a bill approved earlier by the Senate.

Derrick, however, said Wednesday's action by the House almost ensured passage of the low-level waste provisions this year.

"It looks good. I'm not going to be modest about it, we worked awful hard on it," said Derrick late Wednesday.

The bill approved by the House calls for the creation of interstate pacts to shift the responsibility for the handling of low-level waste to a regional basis from the current policy of only three states — South Carolina, Nevada and Washington — burying all of the nation's waste.

The bill would require that each state take responsibility for the waste generated within its borders. South Carolina now receives most of the nation's low-level nuclear waste at a site near Barnwell operated by Chem-Nuclear Services Inc.

The compromise legislation approved by the House also would set a timetable for the adoption of a method to perma-

nently bury the nation's more dangerous high-level nuclear waste.

The bill calls for the federal Department of Energy to present two sites by 1982 as candidates for a federal high-level waste repository. A final selection,

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— Rep. Butler Derrick

under the guidelines of the House bill, would have to be made by 1985.

Derrick's bill was thought to be dead for the year because it had been attached to a more controversial nuclear waste legislative package authored by Rep. Morris Udall, D-Arizona.

Congressional sentiment for the Derrick low-level waste provisions was high after the issue was forced upon Congress last year by Gov. Dick Riley, Washington Gov. Dixy Lee Ray and Nevada Gov. Bob List, who all wanted legislation to shift primary burial emphasis away from their states.

The legislation was written by Derrick along the regional responsibility lines voiced by Riley, who is chairman of a presidential commission on nuclear waste.

The initial Udall measure addressed a wide variety of controversial nuclear waste topics, including liability insurance for nuclear reactors and more stringent

(See Nuclear, p. 6-A)

gent mandates to arrive at a national policy for permanently storing high-level waste.

In the waning months of the 1980 congressional session, Derrick had kept the package — which included his bill — stalled in the House Rules Committee because it included a provision to create temporary away-from-reactor storage sites for high-level waste.

Derrick said that he blocked that bill because he believed that with the approval of away-from-reactor storage that much of the nation's high-level waste would be shipped to the now dormant Barnwell reprocessing facility owned by Allied General Nuclear Services.

Derrick contended that he was not prepared to swap South Carolina's role as the nation's primary dump for low-

level waste for a chief role in storing high-level waste.

Low-level waste is primarily the material used in the handling of radioactive goods, such as gloves and tools. It has a considerably lower level of radioactivity than high-level waste and needs far fewer storage precautions.

Last week, Derrick convinced Udall to cut his low-level bill out of the broader package to be incorporated with milder high-level waste guidelines. After an initial setback, the compromise measure went to the House floor for a vote on Wednesday.

The House-Senate conference committee will begin work on Thursday to reconcile differences between the bill passed by the House on Wednesday and the Senate bill. Derrick was chosen to serve on that conference committee.

Dec. 3, 1980

As I See It! . . .

By Ed Crawford

The Greenville News has been running some articles on nuclear energy—specifically the storage of nuclear waste. Jimmy Carter is not a big nuclear power man. He is not necessarily against it, but he sort of put nuclear power on hold for the last four years.

Ronald Reagan, on the other hand, has pretty much committed himself to pushing nuclear power as an important source of power in this country. If he has his way, nuclear power plants may become more in evidence than they are now.

Nuclear power is a very difficult thing for me to form an opinion on. With the obvious interruptions of conventional sources of power in the 1970's, it is necessary for this country to develop new ways of developing power. Nuclear power seems to fit in the category of developmental sources of power, and perhaps one that

cannot be tossed out as unacceptable. Probably, our problems with energy because of OPEC have been greatly lessened because of nuclear power. But the question still lingers in the mind of most people, is it safe? Furthermore how about nuclear storage? Is there any guarantee that it is safe too?

It depends on who you talk to. The people involved with nuclear technology declare it safe. They bring out all kinds of statistics to prove their point. Nuclear storage people feel the same.

The problem I have with nuclear waste storage and with nuclear power in specific, is its awesome nature. No matter what the chances of a nuclear accident, or that buried materials will seep to the surface, the effects of such an accident are literally mind-boggling. It is not something that we would be able to control by sen-

ding out the national guard. It would be destructive to not only those who happened to be too close but possibly could effect generations to come. Nuclear storage may have even more serious implications, and this is close to home for us in South Carolina because we help store nuclear waste in this state. Can you imagine the catastrophe if one hundred, two hundred years from now, if somehow that stuff got accidentally opened or came to the top somehow? Is it possible? That is what I keep asking myself. How can it be defended if it is not safe?

Our elected leaders must ultimately decide our fate in this matter. It is not something to rush into and it is something that will have a profound effect on generations of Americans. Is it fair to burden them with something we do not totally understand?

Dec. 23, 1980

Let's mark N-waste carriers

Trucks hauling extra-wide, extra-long or extra-anything loads are often preceded by warning cars, or wear huge warning signs, or have warning cars fore and aft. The physical dimensions of the load make the caution necessary.

Trucks carrying gasoline or petroleum products are marked "flammable" or "inflammable" which both mean the same thing. Trucks carrying explosives are specially marked. All these shapes and sizes and potentially dangerous commodities get their share of attention from the highway departments and the drivers with whom they share the road.

It seems reasonable to expect an equal amount of control on the transport of nuclear waste and on

other hazardous wastes as well.

It seems unreasonable that there are only three dump sites in the whole United States — Hanford, Wash., and one in Nevada, another in South Carolina. This means that all the material from Three Mile Island which will be shipped to Hanford will come in through Oregon, not to mention all the other states it will pass through en route.

Gov. Atiyeh wants the upcoming Legislature to allow inspections of nuclear waste shipments and to require permits for such shipments through Oregon. The requirements for relatively harmless loads are strict and inspections frequent. It seems reasonable to ask at least as much regulation for more objectionable material

Dec. 12, 1980

Riley Hints At Closing Nuke Dump

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Dec. 11, 1980

N-Waste Disposal Bill Takes Statesmanship

IF YOU start with the premise that nobody wants a radioactive waste disposal site nearby, then you can understand the trouble in getting Congress to agree on how to locate a disposal site.

A bill which would provide a systematic approach and a set of deadlines for decision-making on radioactive waste disposal is now in a conference committee of senators and representatives who are working against an adjournment hour.

It is the first legislation of this type to proceed so far in Congress since the nation began accumulating nuclear wastes 35 years ago. For a quarter century, the federal government has fooled around with the problems and never developed a single permanent repository. As a result, 23 million gallons of waste are being "temporarily" kept in specially engineered tanks at the Savannah River Plant.

Those wastes are from the government's nuclear weapons program, and they are radioactive and dangerous. But they have been successfully controlled and stored without harming the public or the environment. South Carolinians, however, have a right to ask whether that is to be the final resting place — and if not, where will it be?

The pending legislation is an attempt to answer that impor-

tant question. The legislation also deals with the low-level, and less dangerous, nuclear garbage from hospitals, research, etc., which is now buried at a commercially run site near Barnwell.

U.S. Rep. Butler Derrick of Edgefield has been in the forefront of those pushing for this legislation. He has coordinated his efforts with Gov. Richard Riley who has taken the lead on low-level waste disposal policy in the National Governors Association. They have gotten wide acceptance for legislation to authorize the states to agree to establish regional waste disposal projects.

That, of course, will relieve South Carolina of continued and growing acceptance of the nuclear garbage at the Barnwell site. It is one of three sites in the nation. About 80 percent of the wastes generated in the Atlantic coast states is dumped there.

Mr. Derrick told us in a telephone conversation earlier this week that the low-level waste plans appear assured of agreement in the compromise committee. It is not so clear what the outcome will be on high-level waste plans.

We hope Mr. Derrick and his colleagues will be able to convince the conference members that the problems of high- and low-level radioactive waste disposal are national ones before they become crises.

Dec. 12, 1980

Waste Disposal Meeting Planned

By CLARK SURRETT
Governmental Affairs Editor

Representatives of nine states will meet in Columbia next month to talk about a regional program for disposal of low-level nuclear waste and hazardous chemical wastes, Gov. Dick Riley said Wednesday.

Riley said at a news conference the representatives will begin talking about a state compact for waste disposal. Such arrangements were authorized in legislation passed by Congress last week.

RILEY

The other states involved in this meeting are North Carolina, Georgia, Florida, Tennessee, Virginia, Alabama, Mississippi and Kentucky.

"We now have recognition by law to create a compact here in the Southeast," said Riley. "We will talk about low-level nuclear wastes and then hazardous chemical wastes."

The idea is to get states or regions around the nation to assume more responsibility for their own wastes, an issue Riley has been pushing for months.

South Carolina, with the state-licensed Chem-Nuclear Systems facility near Barnwell, now buries most of the low-level waste produced in the eastern half of the country.

Under the new law, individual states can begin refusing shipments from other states as of Jan. 1, 1986.

RILEY SAID HE had sought to get an earlier date, preferably 1984, for this important trigger mechanism in the law.

On other subjects, Riley said he will meet with representatives of the Carolina Brown Lung Association today to discuss recommendations by him and the South Carolina Industrial Commission to speed up the handling of byssinosis (brown lung) claims.

Riley said a major recommenda-

tion in the report is to have brown lung claimants get a state-paid medical examination immediately after filing for benefits. The examinations would be conducted by doctors at state medical schools, which can be done now but only after a lengthier process.

NOW, BROWN lung claimants must first pay for their own medical examinations. Then if there is a medical evidence dispute between the claimant and the employer, the evidence may be reviewed by a state medical school doctor.

Riley said it will cost about \$7,500 a year to pay for the examinations, and he will seek the funds from the State Budget and Control Board's contingency fund. He said when claims are upheld by the Industrial Commission, employers would reimburse the state for the initial medical exams.

The CBLA, which works on behalf of textile workers seeking compensation for lung damage from cotton dust, has been protesting the length of time it takes the Industrial Commission to process claims.

The governor said he will not name a special panel to study brown lung benefits, as Gov. James Hunt did in North Carolina, because "I chose to study it myself."

RILEY ALSO acknowledged Wednesday that the State Budget and Control Board, which he chairs, probably erred in approving money for staff operations for the State Board of Chiropractic Examiners last spring, two months before the board members were appointed.

"Technically, that might have been a bad decision," said Riley. "It was done a couple of months early."

Therefore, said Riley, the state Reorganization Commission did the right thing in requesting the attorney general to investigate the funding.

Riley said he did not recall the budget board's "going through a decision-making process on this; we have so many items on the agenda."

He said he didn't think the issue is "a situation of a high moral question."

Dec. 19, 1980

NGA-DEVELOPED NUCLEAR WASTE PLAN WINS CONGRESSIONAL APPROVAL

Legislation endorsing a regional solution to the disposal of low-level radioactive wastes has been approved by Congress and is awaiting President Carter's signature. The plan reflects the recommendations developed by the NGA Task Force on Low-Level Radioactive Waste Disposal, chaired by Arizona Gov. Bruce Babbitt, and adopted during the NGA annual meeting in Denver last August.

The bill (S 2189) includes two central principles in the NGA nuclear waste policy that each state be responsible for low-level wastes generated within its borders and that regional compacts among states offer the most promise for an equitable solution. Accordingly, S 2189 authorizes states to form regional compacts and to exclude low-level wastes generated from outside the region from the regional disposal site. Any regional compacts that are negotiated must be submitted to Congress for review, under the bill. The bill also authorizes the Department of Energy to conduct a study of the dimensions of the low-level waste disposal problem and the existing capacity to deal with it. The study would have to be completed within 90 days of enactment.

The NGA Subcommittee on Nuclear Energy, chaired by Idaho Gov. John Evans, worked closely with congressional leaders, especially Reps. Butler Derrick, D-S.C., Tom Corcoran, R-Ill., John Dingell, D-Mich., and Morris Udall, D-Ariz., in gaining enactment of the bill. The Subcommittee on Nuclear Energy was created in 1978 in large part to begin work on a solution to the low-level waste disposal problem. The first chairman of the subcommittee, James Edwards, who was governor of South Carolina at the time, was chosen this week to head the Department of Energy in the Reagan administration.

States have already begun work on the development of regional compacts. On Dec. 11, the Western Interstate Energy Board met to discuss compact formation. South Carolina Gov. Richard

A new report finds that states often receive inadequate representation in major cases before the Supreme Court. See inside pages.

Riley, who chairs the presidentially created State Planning Council on Radioactive Waste Management, has initiated contacts with other southern states on formation of a southeastern region. South Carolina, Washington and Nevada are the only states currently having commercial low-level waste disposal sites within their borders.

Also, northeastern and midwestern states are expected to hold meetings early next year on region formation.

ENVIRONMENTAL SCIENCE AND TECHNOLOGY

Dec. 1980

In-state landfill disposal will be pushed in North Carolina for low-level radioactive waste and for hazardous waste if the recommendations of 2 advisory committees are adopted by the Governor's Task Force on Waste Management. The committees recommended that the state develop shallow-land burial sites for radioactive waste, that regional solutions be pursued—particularly with South Carolina, whose nuclear power reactors serve North Carolina in part—and that a plan for emergency, on-site storage of low-level waste be developed to deal with a possible closing of currently available disposal facilities. They also recommended, for hazardous wastes, setting up in-state landfills and emphasizing prevention, recycling, and reduction of the waste burden. The full task force is to report to the governor on the first of next year.

NUCLEONICS WEEK

Dec. 18, 1980

THE 96th CONGRESS ADJOURNED WITHOUT REACHING AGREEMENT ON A PROGRAM for managing high-level and transuranic wastes and spent fuel. However, Congress did agree to a program for low-level wastes which it carved out of an omnibus waste bill and passed last Saturday (Dec. 13). The Low-level Radioactive Waste Policy Act assigns states the responsibility for low-level commercial wastes generated within their boundaries. The wastes may be disposed of within a state, or somewhere in the region through multistate compacts. These compacts must be approved by Congress and reviewed every five years.

Congress went forward with the low-level waste program with the prodding of the South Carolina delegation. Currently there are only three states which contain low-level waste disposal sites: Washington, Nevada and South Carolina. Washington voters recently decided to severely restrict the amount of low-level waste the state will accept, and Nevada's governor wants to close the Beatty site. "It is grossly unfair, unwise and unacceptable to expect South Carolina to assume this disproportionate burden indefinitely," Sen. Strom Thurmond (R-S.C.) told his colleagues during debate.

Prospects for passage of a broader nuclear waste bill seemed bright earlier this month when the House finally reached agreement on a nuclear waste management bill five months after the Senate agreed to a waste bill. It appeared key senators were prepared to accept the House version with minor amendments, although that bill omitted major provisions of the Senate bill such as away-from-reactor storage of spent fuel. Questions about AFRs, retrievable storage, and other features of the Senate bill could wait until next term for resolution, these senators concluded. All seemed well until controversy erupted when Sen. Henry Jackson (D-Wash.) offered an amendment to exempt all wastes relating to defense activities from the program outlined in the bill. Senate colleagues offered Jackson a compromise which would have excluded all currently authorized defense-related nuclear waste programs -- including the research and development and temporary storage programs at the Waste Isolation Pilot Plant and Hanford -- but would include on a "prospective basis" all defense-related permanent waste disposal programs, "with the understanding that such programs can be specifically exempted from the provisions of the act in the interest of national security at the time such programs are authorized." Jackson rejected that proposal. So the question of defense wastes, along with the other unresolved waste issues, will be handed over to the 97th Congress for consideration.

Dec. 19, 1980

Nuclear Energy

ONLY LOW-LEVEL RADIOACTIVE WASTES INCLUDED IN BILL PASSED BY CONGRESS

Unable to agree on a comprehensive nuclear waste management bill, the Senate and House Dec. 13 passed by a voice vote a bill that deals only with setting up repositories for low-level radioactive wastes.

Under the bill, "the Low-Level Radioactive Waste Policy Act" (S2189), states are responsible for providing low-level radioactive waste disposal capacity for wastes generated in their states, except for wastes generated by the military or federal research and development activities.

To carry out that responsibility, the bill authorizes states to enter compacts to establish and operate regional disposal facilities for low-level radioactive wastes.

However, Congress would have to approve each compact and every five years thereafter could void the compacts.

After 1986, a compact could restrict use of a regional facility to wastes generated within the region. The bill orders the Department of Energy to submit within 120 days to Congress and to the states a report that defines the regional disposal capacity needs, defines status of all commercial low-level radioactive waste disposal sites, evaluates transportation needs, and evaluates the present capability of disposal sites owned by DOE to provide interim storage for the wastes.

The bill, is essentially the version of S2189 that the House passed Dec. 3 (Current Developments, Dec. 5, p. 1177) with amendments made by the Senate that deleted all sections of the bill not relating to low-level wastes, and specifying that the bill does not cover military wastes.

The House and Senate reached an impasse on the House bill the week of Dec. 8 when Rep. Morris K. Udall (D-Ariz) and John D. Dingell (D-Mich) refused to agree on an amendment introduced by Senate Energy Committee Chairman Henry M. Jackson (D-Wash) that all military wastes should be excluded from the comprehensive House bill, which would have established repositories for high-level nuclear wastes and spent fuel, in addition to the provision for low-level radioactive wastes.

"Although the most complex and urgent radioactive waste disposal problems still remain before us, I am gratified we could at least address this issue," Udall said on the House floor Dec. 13.

At that time, Dingell noted that "time constraints enabled a few senators to hold out for a position which was not consistent with the House bill and curiously was also not consistent with the Senate bill."

Udall and Dingell said completing working on high-level waste repositories would be one of their highest priorities in the 97th Congress.

Renee Parsons, of Friends of the Earth, told BNA that the low-level waste bill is "responsible," but that Congress has yet to agree on any of the controversial issues for comprehensive nuclear waste management.

Parsons added, "Udall and Dingell now have committed themselves to a comprehensive nuclear management bill that includes military wastes. And I think with a coalition like Glenn, Percy, Hart, Udall, and Dingell, Jackson better reevaluate whether he wants to stay with his position."

Senators Gary Hart (D-Colo), John Glenn (D-Ohio), Charles Percy (R-Ill), and Jennings Randolph (D-WVa) had sent a letter to Jackson urging him to accept the House position on military waste.

According to Laura Worby, staffer on the Senate Environment and Public Works Subcommittee on Nuclear Regulation, the push toward a compromise bill came from Rep. Butler Derrick (D-SC). South Carolina is one of only three states with commercial low-level repositories in the United States.

Nov. 7, 1980

State, Federal Government Agree On Waste Shipment Plan

By MIKE LIVINGSTON
Governmental Affairs Staff

Gov. Dick Riley announced Thursday that differences between the state and federal governments regarding shipments of federal nuclear waste in South Carolina have been resolved with the signing of an innovative agreement.

At issue was a new state law controlling the movement of wastes that did not exempt the Department of Energy and Department of Defense shipments from state control — a move that drew federal resistance.

GOV. RILEY

myself with all waste regardless of its origin. So I feel all generators and transporters of nuclear waste should

The federal government, Riley explained, did not want to run into a barrage of controls installed by the various states that might vary greatly.

"Federal officials communicated to me that the new law should not apply to federal shipments and I felt that there should not be a wholesale exemption of shipments made by the United States government," said Riley.

"My responsibility as governor involves the health and safety of all South Carolinians. Nuclear waste is nuclear waste and I must concern

adhere to these new standards," he said.

The "principles of understanding" signed by Riley and federal officials allow the federal government to forego obtaining specific transportation permits from the state, but the state will still receive prior notification of all shipments.

ADDITIONALLY, the state maintains the right to suspend or revoke the waste disposal privileges of any federal generator shipping waste to either the Chem-Nuclear Systems low-level nuclear waste dump near Barnwell or to the federal Savannah River Plant.

The department of Health and Environmental Control monitors shipments at Chem-Nuclear. And Riley said enforcement procedures have been established at SRP between that plant's operations office and DHEC.

If a shipping violation occurs at SRP and the DHEC commissioner is not satisfied with the action taken, the new agreement provides that the matter be handled directly by the governor and an undersecretary of energy, Riley said.

"The big problem in nuclear waste has been this intergovernmental situation — the problem of who does what," he said. "This is an example of a state which made a strong move in the regulation of wastes and which negotiated with the Department of Energy to everyone's advantage."

Nov. 7, 1980

U.S. To Follow S.C. N-Waste Laws

From Associated Press Reports

COLUMBIA — Gov. Dick Riley announced Thursday that the federal government has agreed to comply with S.C. laws controlling transportation and disposal of low-level radioactive wastes.

Riley said the agreement with the U.S. Department of Energy (DOE) means waste shipments from federal nuclear facilities to two S.C. sites will be subject to the same safeguards a new state law forces on commercial shipments.

The agreement was reached after Energy Department officials, citing the Constitution, said federal shipments wouldn't be subject to a state law enacted last spring, Riley said, because federal law

overrides state law.

The state law, for the first time, establishes civil penalties for certain violations and allows the state to revoke licenses of repeat offenders.

The governor said the main difference between the agreement and the state law is that federal facilities won't have to receive the permits required of commercial operations.

"The big problem with nuclear wastes in this country has been intergovernmental — who can do what to whom," Riley said. "Under this agreement, DOE has agreed to do the same thing they would have to do under the state law."

South Carolina is one of three

states with facilities licensed to store low-level nuclear garbage. The others are Washington and Nevada.

Riley said the agreement requires that the state receive prior notification from federal facilities and contractors planning to ship waste to either the Savannah River Plant or the privately operated, state-owned Chem-Nuclear Systems dump. Both are near Barnwell.

A year ago Riley began to phase down the amount of waste South Carolina would accept. The Chem-Nuclear dump in recent years has received as much as 35 percent of the nation's low-level radioactive garbage.

Nov. 17, 1980

State now has better grip on nuclear waste problem

Gov. Dick Riley has led his state toward reasonable handling of nuclear waste while providing leadership for a national or at least interstate policy toward expected future expansion of the field.

The federal government, in almost complete absence of any regulations of its own, now agrees to comply with state laws controlling transportation and waste disposal.

Federal wastes now will be subject to the same oversight as commercial operations on which Riley and several other states cracked down severely some time ago.

Previously federal shipments were not subject to state authority, traveling under protection of a constitutional supremacy concept.

Essentially Riley's power as a nuclear waste leader was brought to bear to keep his promise that South Carolina not become a nuclear dumping ground.

It was a pressing issue because

the state was receiving up to 85 percent of the nation's total load, plus heavy shipments of international waste.

Extension of the atomic regulations to federal shipments is not designed to hamper out-of-state nuclear programs in any way. It merely gives the state ultimate control over shipment methods — many of which have been found to be faulty — and site storage.

Riley also has wisely led the fight toward regional compacts to handle nuclear waste, which appears to be the best answer because the federal government does not seem able to come up with better plans.

While South Carolina's share of the dump need not be excessive, the state will continue to play a large part in protecting and promoting the nuclear future of the country, even if other states selfishly refuse to participate despite their hefty contributions to the leftover atomic piles.

Nuclear-Waste Disposal Site

Low-level wastes, which can be very radioactive and quite dangerous to living creatures, include contaminated paper, plastics, construction materials, tools, protective clothing, industrial wastes and contaminated trash produced by nuclear medicine.

Waste Has Many Sources

Of the 100,000 cubic meters of low-level wastes annually buried in the three commercial dumps in the United States, about 43 percent comes from nuclear-power plants, 25 percent from hospitals, 24 percent from industry and 8 percent from the federal government.

The Energy Department also buries about 50,000 cubic meters of this waste each year in its own dumps.

Three other low-level commercial dumps have been closed. One, at Sheffield, Ill., was closed after it was filled in 1978. Two others, at West Valley, N.Y., and Morehead, Ky., were closed in 1975 and 1977 because of water contamination problems.

For 25 years, until 1970, a great deal of low-level waste was put in metal barrels and dumped at 50 sites in the ocean. Officials of the Environmental Protection Agency say one-quarter of those barrels now are leaking. Experts disagree on the environmental effect of the leaks.

Wastes Travel Far

Low-level wastes currently are buried in dirt-covered trenches at the three dumps. On the East Coast, where most nuclear-power plants are located, there is only one dump, at Barnwell, S.C. Because that facility can't accept liquid wastes, trucks must carry this garbage to Hanford, Wash., from as far away as New England.

Claiming that federal regulations concerning the packaging and transportation of these wastes were being ignored, the states of Nevada and Washington in 1979 ordered their dumping grounds closed for several weeks. This closure awakened other states to the impending crisis.

Nuclear-Waste Sites Decline

The growing dilemma of nuclear-waste disposal has citizens and public officials in many states mobilizing to prevent nuclear wastes from being stored in their regions or even trucked through on public roads.

The three states with commercial burial grounds for low-level radioactive trash are considering closing them or limiting what they will take. California officials nervously are examining the effects of radiation leaking from thousands of barrels of radioactive wastes dumped off the San Francisco coast in the 1950s and 1960s.

Time Running Out

At the same time, the nuclear power industry and utilities are running out of room to store burned nuclear fuel and are bringing pressure on the federal government to store it for them.

Despite this growing public concern over disposal of radioactive wastes, Congress never has enacted a national nuclear waste plan and it is unlikely that Congress will pass a bill in the current post-election session.

Election Intensified Problem

But the Nov. 4 election may have pushed the problem closer to the front of the line of those decisions the 97th Congress must face next year. Voters in several states made it clear they don't want radioactive wastes in their back yards.

The most immediate problem is the burial of "low-level" nuclear wastes, which are generated in every community in the United States. There are only three dumps for this type of waste in the nation. Washington voters decided Nov. 4 to close that state's dump next summer. The governor of Nevada has pledged to close his state's burial grounds and South Carolina has cut in half the amount of waste its dump will take.

The National Governors' Association and other organizations of state and local officials say the disposal of low-level wastes should be a state responsibility. But they say legislation is needed from Congress stating this and giving states the authority to enter into regional compacts to handle radioactive trash.

Feds Face Dilemma

While the states face the low-level waste problem, the federal government must decide what to do with high-level wastes generated in nuclear reactors and in producing nuclear weapons. Some of these wastes remain radioactively hazardous for hundreds of thousands of years.

President Carter announced in February the government would take a safety-first approach to finding permanent repositories underground.

Nov. 6, 1980

Westerners Vote To Ban Storage

Washington State Initiative May Help Riley's Nuke Plan

By MIKE LIVINGSTON
Governmental Affairs Staff

The state of Washington's overwhelming vote to ban storage of most out-of-state low-level nuclear waste may have given Gov. Dick Riley's push for interstate burial pacts a shot in the arm, a Riley aide said Wednesday.

WASHINGTON IS ONE of only three low-level burial grounds in the nation, the other two being in Nevada and at Chem-Nuclear Systems in South Carolina near Barnwell.

Chem-Nuclear at one time received more than 80 percent of the nation's low level radioactive waste, more than half coming from seven states in the industrial Northeast and Midwest.

A year ago, Riley began a phase-down on the amount of waste South Carolina would accept and started pushing other states to take care of their own waste or, even better, create multi-state compacts for waste disposal. That idea is currently gaining momentum.

The initiative by Washington voters — which probably will be challenged in court — is a "two-edged sword," in that it may reduce further the availability of dumping facilities, but at the same time put more heat on states to build their own, said Riley's executive assistant David Reid.

"It does put more pressure on those states which generate significant amounts of low-level nuclear waste to move quickly to create sites in their own states or enter into a compact with a state that does have a site," he said.

"Now there are a number of states — Virginia being the most active — that are working hard to create a disposal site within their borders. This is going on in Texas, Illinois, the New England region and North Carolina has a task force looking into it.

"THE PRESSURE HASN'T been coming to us — it's the other way. We are putting pressure on the generators to build a waste site or join a compact.

"And things are moving very well for the interstate compacts. The National Governors Association and the National Conference of State Legislators have agreed with Riley's proposal that this is a matter for state government to deal with.

"And the responsible, preferable method is to create interstate compacts for regional disposal sites," he said.

Currently under Riley's phase-down plan for Chem-Nuclear, the facility is receiving only about half of the nation's low-level waste, or about 144,000 cubic feet per month. At the high point, South Carolina was taking more than 200,000 cubic feet. And by this time next year, Chem-Nuclear may accept only 100,000 cubic feet per month.

The Washington initiative, which has not yet been reduced to specific legislation, excludes radioactive waste from medical facilities and also from those states which agree to develop their own sites.

Oct. 30, 1980

NRC's List Of Waste Shipment Routes Stirrs Up A Storm

"It's the worst since TMI." That's how the Nuclear Regulatory Commission's public affairs office describes response to the NRC's first "public information circular for shipments of irradiated reactor fuel," issued last week. The circular, the first in a proposed series of semiannual publications on spent fuel shipments, gives statistical information on: NRC-approved routes for spent fuel shipments; cumulative amounts of material shipped in a given period; and any safeguards-significant incidents which have occurred along the approved routes (there haven't been any yet, NRC says). NRC information staff were kept busy all weekend answering queries from "every newspaper in every state" on the circular's list of 33 states, said spokesman Joe Fouchard.

The NRC statistics show that a total of 94 shipments involving 46,710.7 metric tons of spent fuel were made between July 16, 1979 and September 10, 1980. The largest amount of material between two points was 35,000 metric tons, shipped in 10 batches between the Robinson nuclear plant in Hartsville, S.C., and the Brunswick site in Southport, N.C. Seven thousand metric tons were shipped from San Onofre, Ca., to Morris, Ill., in 14 loads. And some 1,800 metric tons were shipped out of the Fort St. Vrain gas-cooled reactor to the Idaho National Engineering Laboratory to await reprocessing by Exxon Nuclear.

TIME IS AGAINST MET ED AND NRC ON TMI-2 WASTE, NRC STAFFER SAYS

The low-level waste resins inside 49 of the 69 canisters of waste sifted from 500,000 gal of contaminated water from the auxiliary building at TMI-2 could become so degraded through radioactivity that solidification might no longer be possible, according to an official of the NRC office of nuclear material safety & safeguards (NMSS). "Time is against us," he warned.

The 49 canisters contain nearly all the radioactivity from the total 69, he said — some 55,000 curies of mostly cesium-137. The possible danger is that the resins could degrade from their current form of beads to possibly a jelly-like or molasses-like mass that might give off gases and corrode the containers. The radioactivity of the 49 canisters is some 40 times higher than that from resins from a routinely operating reactor, the staffer said.

The NRC commissioners have mandated that the wastes be solidified before they can be transported although the licensee, Metropolitan Edison, disagrees. So far, no firm solidification plan has been approved, although Met Ed has worked on cement solidification.

In addition, the NMSS staffer says, the results of a November referendum on the Hanford low-level waste-disposal site may mean that wastes will be prohibited there after July 1, 1981. Nevada is considering closing its site — and TMI-2 waste is excluded from the South Carolina waste disposal site.

The low-level waste from the auxiliary building is problem enough, the staffer told Inside NRC, but waste similar to high-level waste is involved in the resins that will be collected from processing the 700,000 gal of water in the containment building. That water is 10 times as radioactive as the already processed water from the auxiliary building — with 500,000 curies of both cesium-137 and strontium-90. That waste, he says, will fill about 50 containers with radioactivity of 1,400 curies per cu ft. This is where the NRC staffer is convinced that DOE should come in to help.

However, the DOE viewpoint, according to one DOE staffer, is that the TMI-2 waste has too short a half-life (about 30 years) to be defined as high-level waste, and that by law TMI-2 waste cannot be deposited in a defense facility.

Also at issue is the method to be used to purify the containment water. NRC maintains that an excellent job of purification was achieved with the auxiliary building water through use of the Epicor II system — but that other means are necessary for the containment water. Met Ed has designed a submerged demineralizer system which Oak Ridge National Laboratory says must be improved, an opinion shared by NRC. One possibility, the NRC staffer said, is that the demineralizer system may be used in conjunction with the Epicor II method.

Met Ed would like to use shallow burial for the containment building resins, on the assumption that no NRC regulations exist to say this can't be done, the NMSS staffer said. But, he said, "We've never dealt with waste like this. There are no regulations designed for it. We've never seen anything like it."

The third sizable quantity of water — some 100,000 gal — still to be processed is the primary coolant system in the pressure vessel. This is less radioactive than the sump water, the NMSS staffer says, but it may possibly have transuranic wastes in it like uranium and plutonium. Also, that water must be recycled continually so that the primary system doesn't go dry. — Joanne Dann

Sept. 1980

LOW-LEVEL WASTE CONFERENCE - Transportation problems and the urgency of developing new disposal sites were some of the issues addressed at an NCSL-sponsored low-level radioactive waste management conference held in Albuquerque, New Mexico, August 17-19.

Co-chaired by Senator Paul Hess of Kansas and Representative Gordon Voss of Minnesota, the conference faculty and participants represented legislatures, legislative staff, executive agencies and industry from over one-half of the 50 states.

The three-day session, hosted by the New Mexico Radioactive Waste Consultation Committee, began with an overview session designed to present the scope of the problem. Moderated by Davie Reid of South Carolina Governor Richard Riley's staff, a panel composed of representatives of industry, nuclear medicine and an environmentalist group, discussed the different generators of low-level waste and potential environmental hazards. Heyward Shealy, South Carolina's chief radiological health officer also presented a historical review of federal-state roles in the regulation of waste disposal.

The remaining presentations focused on state activities highlighting a myriad of legislative approaches to low-level radioactive waste management which range from disposal bans to requiring legislative approval prior to site suitability investigation. Perspectives of three states affected by different aspects of the waste cycle were examined. New York Assembly staffer Bob Kurtter represented a generating state, Dan Kemmis, a Montana state representative, reviewed transportation concerns, and Washington Senator Al Williams discussed the views of a state hosting a disposal site.

National initiatives and federal agency responsibilities were described by representatives of the Nuclear Regulatory Commission, Department of Energy, a DOE task force which developed a national strategy for low-level waste management and the President's State Planning Council of Radioactive Waste Management. Elgie Holstein of NCSL's Washington, DC staff reviewed pending Congressional legislation dealing with low-level waste. Following these various perspectives, the participants attended concurrent afternoon workshops on the topics of transportation systems, disposal site selection and management, and interstate compacts and agreements.

In order to solicit feedback from the participants, the last day of the meeting consisted of a series of regional discussion groups. States assuming responsibility for managing low level wastes and endorsement of a regional management approach were supported by legislators involved in these discussions. Legislators at the meeting also encouraged NCSL to work with the National Governors' Association and the President's State Planning Council in conducting six regional conferences to explore options for regional approaches to managing low-level wastes. The need to involve key legislators from each state in the advance preparation for each conference was emphasized, and it was also suggested that in addition to governors and legislators, representatives of other state and local organizations should be invited to participate in these conferences.

NUCLEONICS WEEK

Aug. 28, 1980

NEGOTIATIONS FOR DOE TO BUY THE BARNWELL, S.C. REPROCESSING PLANT will begin soon if an enabling amendment authored by Rep. Don Fuqua (D-Fla.) gets through Congress and gains White House approval. According to a congressional source, the Fuqua amendment "not only authorizes, but directs the DOE Secretary to negotiate the purchase." Fuqua's amendment is being carried on DOE's research and development appropriations bill for FY-81 and on another bill which establishes and funds a fusion engineering test facility, in hopes that one bill or the other will become law. To have any hope of becoming effective this year, the amendment must pass through Congress by Oct. 4.

The amendment specifically provides \$11.5-million for Barnwell: \$9-million for keeping up Barnwell's r&d programs in away-from-reactor (AFR) storage and nuclear safeguards, and \$2.5-million for negotiations to acquire the reprocessing facility through outright sale, leasing or condemnation. According to a source at Allied-General Nuclear Services, which owns and operates Barnwell, "They've done some tinkering with the amendment for the sake of compromise. A provision that Barnwell be acquired for AFR storage was deleted in exchange for stronger language on DOE's intention to negotiate the purchase." Despite this, a conflicting provision still attached to the amendment mandates negotiations for AFR storage arrangements at Barnwell, to be in effect until final purchase arrangements are negotiated.

The congressional source said that the amendment's passage through Congress should be smooth. "There won't be any trouble in getting it through Congress," the source said. "The trouble will come when the bill hits the White House. Now, I don't see how the Administration can turn it down. Of course, Barnwell's a reprocessing plant, but on the other hand the plant's about two years from completion. The bill would also give the government control of the facility." A White House spokesman had no comment.

Work on the Barnwell reprocessing plant was stopped in 1977 following President Carter's decision to defer commercial reprocessing. "There's a moral basis to this bill, too," the congressional source said. "We allowed these people to build the plant, but then we didn't allow them to use it. That certainly puts the government in a shaky moral position."

The amendment states that the Barnwell negotiations must be completed by the time DOE's FY-82 authorization is submitted to Congress, which should be in January 1981. "We don't expect any trouble with the negotiations," an Allied-General source said. "Besides, this is a foot in the door on the problems faced at Morris and West Valley. It's a plus."

State Officials Map New Plans In Case Of Nuclear Emergencies

By Sharon Bailey
Constitution Staff Writer

In the wake of the Three Mile Island nuclear-plant accident, Georgia officials have upgraded state plans and equipment to cope with emergencies involving radioactivity, a state environmental protection official said Monday.

The state's new emergency plan to protect the public from radiation emergencies is now being reviewed by federal officials, and Georgia has added a mobile laboratory equipped with devices to analyze radiation to its arsenal of emergency equipment, according to Bill Cline, environmental radiation program manager for the Department of Natural Resources.

Cline said the emergency plan includes a general section on how the state would handle radiation emergencies — whether they occurred at nuclear facilities, hospitals, research laboratories or other sites — plus a detailed plan for each of the major nuclear facilities in or adjacent to Georgia.

Cline said detailed plans have been de-

veloped for four nuclear power plants, including Plant Hatch near Baxley, the TVA's Sequoyah Nuclear Plant just north of Chattanooga; Plant Farley in Alabama, southwest of Blakely; and the Oconee Nuclear Station in Seneca, S.C.

In addition, detailed emergency procedures have been prepared in case of an accident involving the U.S. Savannah River Plant near Augusta, a government facility which processes material for nuclear arms; the U.S. Navy's Kings Bay Nuclear Submarine Support Base in Camden County; and Georgia Tech's Nuclear Research Center on the Tech campus, he said.

The state has also developed a detailed plan to cope with accidents involving the transportation of nuclear materials through Georgia.

Cline said the new emergency measures are awaiting review by the Federal Emergency Management Agency, which expects to complete its examination of the document at the regional level by the end of this month.

"I'm very confident about our plan,"

Cline said, adding that the state has the capability to "to handle a 'Three Mile Island' type of incident" if necessary.

Each of the detailed plans for nuclear facilities includes measures for the protection or evacuation of persons within a 10-mile radius of the site, plus measures to check water supplies, dairies, stored animal feed and similar items within a 50-mile radius to make sure contamination has not occurred or is not spread elsewhere, he said.

As part of its effort to upgrade its "preparedness" for radioactive emergencies, Cline said, the state has spent \$80,000 to \$100,000 buying and equipping a van with sophisticated equipment to be used to analyze the amount and kind of radiation in case of an accident.

The van could be at Plant Hatch or Plant Farley within two hours of notification of an emergency, and testing could be completed within an hour to determine whether an evacuation should be ordered, he said.

Map shows nuclear installations in Georgia and around its borders. Emergency plans for Georgia include the state's one nuclear plant, and neighboring ones in Tennessee, South Carolina and Alabama, plus such nuclear facilities as the Savannah River Plant in South Carolina, the Kings Bay Nuclear Submarine Base in St. Marys, and Georgia Tech's Nuclear Research Station in Atlanta. (Staff Artwork—Jere Warren)

GOVERNORS ASK FOR REGIONAL TRADE-OFFS ON RADIOACTIVE WASTE

States should be responsible for handling waste problems in regional associations working under federal incentives, according to a report released last week at a National Governors Association (NGA) meeting in Denver.

The report recommends dividing the U.S. into six regions. Any regional association of states working together under a formalized agreement would decide jointly on a disposal site and could then exclude radioactive waste from states outside the region. However, the governors' report leaves a number of "floater" states that can choose which region to join.

The report provides limited guidelines on site-selection procedures including a "trade off" recommendation. Using this method, a state which accepted a radioactive waste dump could then send its industrial hazardous waste to another state.

Washington presently takes Oregon's nuclear waste and Oregon accepts toxic chemical waste from Washington under a trade-off agreement.

Economic compensations to the state accepting a low-level dump are recommended in the report. It suggests direct payments to be financed by both the federal government and the nuclear industry. The siting problem is viewed as "political," with no state likely to want a dump within its borders. NGA considers incentives the necessary "carrot" to save what has become an intergovernmental problem.

Public participation during site selection is strongly recommended by the NGA report, with state legislatures ratifying final decisions on siting.

Existing sites for low-level waste are inadequate, according to the report. By 1990, there will be three times as much low-level waste as there is now. Sites in Washington and Nevada were closed last summer because of violations of shipping and packaging regulations (See *HWR*, Vol. 1, no. 11, p. 13). South Carolina also curtailed the amount of waste it will accept. The Nuclear Regulatory Commission estimates that it takes two to four years to develop a disposal facility.

ENVIRONMENT REPORTER - CURRENT DEVELOPMENTS
(Bureau of National Affairs)

Aug. 8, 1980

Nuclear Energy

**GAO OFFICIAL URGES TYING FEDERAL AID
IN WEST VALLEY CLEAN UP TO FUTURE USE**

Linking federal help in cleaning up nuclear wastes at the Western New York Nuclear Service Center, West Valley, N.Y., to possible use of the site for storing nuclear wastes and spent fuel is a "practical solution" to local and national needs, a General Accounting Office official said July 28.

J. Dexter Peach, director of GAO's energy and minerals division, told the House Commerce Subcommittee on Energy and Power that a recent GAO report (EMD-80-69, June 6, 1980) concluded that the Federal Government should assume some responsibility for cleaning up the West Valley site, but in return and if found technically adequate, the state should agree to reopen the spent fuel storage facility to serve as a regional away-from-reactor (AFR) storage pool and the low-level waste burial grounds as a regional burial site.

New York Governor Hugh Carey told the subcommittee that the current agreement with the Department of Energy does not preclude the use of the site if it is found to be suitable. Nevertheless, Carey said he supports HR 8865, which does not link future use of the facility to the proposed solidification project. "Just because West Valley is a reprocessing center does not automatically make it the most suitable [AFR] site," he stated. Seismic, geological and water leaching conditions should be assessed thoroughly before AFR decisions are made, Carey said.

In response to Carey, Congressman Phil Gramm (D-Tex) said if the Government pays 90 percent of the costs of the project, as proposed in HR 8865, the Government should be given some assurances by the state that citizen's fears or objections will not preclude the use of the site.

Under HR 8865, introduced by Congressman Stanley N. Lundine (D-NY), a \$5 million demonstration project would be established to solidify some 600,000 gallons of high-level liquid radioactive wastes. Total costs of the project are estimated by DOE to be \$180 million, which would be shared by the Government and the state at 90 percent and 10 percent, respectively. A similar measure, S 2443, already has been approved by the Senate (Current Developments, June 20, p. 284).

Safety of Facilities Disputed

DOE, the Nuclear Regulatory Commission, and Nuclear Fuel Services which currently is responsible for the site, told the subcommittee that the spent fuel storage pool facilities can be reopened safely and used for AFR storage. C. Worthington Bateman, under secretary for DOE, noted however that DOE currently does not have authority to administer an AFR program. But if Congress provides such authority West Valley and facilities at Morris, Ill., and Barnwell, S.C., would be candidates for providing near-term storage capacity, he added.

At this time, Bateman said, DOE wants to keep open the option of using the West Valley storage pools for storing the solidified waste until it is transported to a permanent disposal site.

Current data do not indicate that the low-level waste burial grounds pose any health hazards, Bateman stated. He added that the disposal of low-level wastes is solely a state concern and that the NRC, not DOE, has ultimate licensing responsibility.

Congressman Lundine told the subcommittee that there are serious questions regarding the suitability of both the spent fuel pool and the low-level waste burial grounds. He said the storage pool has structural weaknesses which make it difficult to rerack or expand the pool to store additional fuel rods and to meet NRC seismic criteria. He noted that water has leached into the low-level waste burial sites several times in the past and as recent as last spring.

Lundine warned the panel that subjecting the current agreement between the state and Federal Government to "quid-pro-quo arrangements" as suggested by GAO would undermine both the credibility of the policy-making process on West Valley and Administration efforts to establish a national nuclear waste management program.

Aug. 8, 1980

STATES URGED TO TAKE LEAD IN LOW-LEVEL WASTE DISPOSAL PROGRAM

States negotiating cooperatively to select from six to eight regional disposal sites for low-level radioactive wastes, in addition to congressional approval of financial "incentives" to such states, would promote the most rapid solution to the nation's low-level waste disposal crisis.

These are among the primary recommendations of the NGA Task Force on Low-Level Radioactive Waste Disposal, chaired by Arizona Gov. Bruce Babbitt. The recommendations were adopted as NGA policy during the association's annual meeting in Denver this week.

The task force report also spells out a process for the development of regions; selection of sites; recommended roles for state and local governments, the federal government and private industry; further research which is needed on the technical issues of low-level waste disposal; and congressional legislation which would authorize states to form compacts and allow those which form regions to exclude out-of-region wastes.

Currently, there are only three commercial waste disposal sites in the nation--at Barnwell, S.C., Beatty, Nev., and Hanford, Wash.

Last year, Washington Gov. Dixy Lee Ray and Nevada Gov. Robert List ordered the sites in their states closed temporarily following the consistent failure of waste generators to properly package and transport their wastes, and the subsequent failure of several federal agencies to adequately enforce waste packaging and transportation regulations and impose proper sanctions.

Additionally, at the Barnwell site, which annually has been receiving over 75 percent of the nation's commercial wastes, South Carolina Gov. Dick Riley has established a drastic phased reduction in the volume of waste accepted at the site. Also, Riley has announced that Barnwell will reject wastes from certain generators with records of poor packaging and shipping practices.

These actions, coupled with the expected increasing volume of waste generated by medical diagnostic and research activities, and military and industrial activities (the nation is expected to generate 321,00 cubic meters of low-level waste by 1990 compared to 99,000 cubic meters in 1980), led to the formation of the task force by the association in December 1979.

The task force recommends that each state accept primary responsibility for the safe disposal of low-level radioactive waste except for waste generated at federal government facilities.

"Since low-level waste is generated in every state, it is unfair to expect three states to shoulder the sole responsibility for the safe disposal of the nation's waste," the task force report states. "Unlike high-level waste, the problem is not so technologically complex that it requires the leadership of the federal government."

A regional approach is favored, according to the report, because, with the exception of a few of the biggest waste generating states, the volume of waste generated in a single state is too small to make operation of a disposal site economical.

The report recommends that Congress authorize the states to enter into interstate compacts to establish regional disposal sites. "Such authorization should include the power to exclude waste generated outside the region from the disposal sites," the report states.

The report also outlines procedures for the formation of regions and for the selection of disposal sites within each region. "A state which is ultimately selected as a regional site can exercise a veto, but as a penalty that state would be required to drop out of that compact... If the vetoing state is denied access to the regional site it will have to either find another region which will accept its waste, or make its own arrangements in-state. The former would be very difficult, and the latter would likely be economically unattractive," according to the report.

The report also outlines incentives which could be used to encourage a state or local community to accept a waste site within its borders.

Such incentives, according to the report, could include a special discretionary fund provided by Congress for use by the site state and site community, a commitment to employ a certain number of local residents at the waste site, a percentage of revenue generated at the site for the local government, and encouragement for users of the facility to locate near the site.

In addition to Gov. Babbitt, Govs. Bill Clinton of Arkansas, John Evans of Idaho, James Thompson of Illinois, Robert List of Nevada, Dixy Lee Ray of Washington, Dick Riley of South Carolina, and Dick Thornburgh of Pennsylvania served on the task force.

Aug. 1, 1980

Someone Is Making Money In Nuclear

The nuclear industry may be up to its neck in problems, but Chem-Nuclear Systems of Bellevue, Wash., is keeping itself well clear of trouble.

Chem-Nuclear is in the garbage business—one of a handful of companies around the country offering low-level radiation decontamination services and disposal of low-level trash. Where others watch their markets shrink, Chem-Nuclear sees growth and expansion.

The most reassuring factor in the company's future is the doubling it expects in U.S. nuclear generation—to 167 operating plants by 1990.

The company's sales have grown at a compound annual rate of 73 percent since 1975—from a mere \$3 million that year to \$26.6 million at the end of its 1979 fiscal year. For 1980, which ends July 31, analysts predict sales will exceed \$40 million.

One reason is Three Mile Island, a disaster not without some beneficiaries. Besides transporting nuclear trash to Hanford, Wash., Chem-Nuclear has a \$1.8 million contract to design and install a submerged demineralizer system to remove radioactive water from the damaged reactor building. And it is expected to receive follow-on contracts from TMI that could amount to between \$10 million and \$15 million, analysts say.

Chem-Nuclear's mobile services also have blossomed rapidly. Company president Bruce Johnson, a 35-year-old former public affairs director for Boeing Aerospace, aims to enlarge the fleet of vehicles providing mobile solidification and demineralization services at nuclear power plant sites. From only three units three years ago, the fleet has grown to 18 today, and Johnson wants to add two dozen more.

The company also will garner its share of work when Manhattan Project engineering centers are dismantled and as old nuclear plants are decommissioned over the next decade.

For the moment, however, the primary engine of Chem-Nuclear sales has been its low-level radioactive waste disposal site at Barnwell, S.C., one of three regional sites licensed to receive utility wastes and

It's Waste To Some, But For Chem-Nuclear, It Means 73 Percent Annual Growth

By William Cushing, Seattle

the only site in the eastern U.S. (which produces 90 percent of the waste products from commercial reactors). As might be expected from its location, Barnwell, until recently, absorbed up to 80 percent of the nation's low-level utility wastes.

Last year, however, South Carolina governor Richard Riley cut the burial rate at Barnwell to a maximum of 100,000 cubic feet per month by October 1981—halving the volume the site receives. But Chem-Nuclear fared better than its competitor, Louisville-based Nuclear Engineering Co. Inc., whose disposal site at Beatty, Nev., was denied a new permit early last month. NECO also operates the third active low-level waste disposal site on the federal reservation at Hanford.

New higher disposal fees will help to mitigate losses from reduced burials at Barnwell, which—even with the restrictions—could operate for another 25-35 years, says chief executive Johnson. The company owns another 40 acres that fit into the site which, if licensed, would further extend Barnwell's life.

And Johnson is not worried about further restrictions. "I see no problem with our running a site in South Carolina," he says. "The question is what action will the states and the federal government take if [other existing] sites are restricted. If, in the next two or three years, other regional sites are opened, the problem will go away. But Barnwell cannot continue as the only major low-level radioactive [burial] site."

Relieving the pressure won't be easy. The process of identifying and developing new regional sites won't move ahead until the Nuclear Regulatory Commission develops criteria for handling low-level rad-

waste, Johnson believes. But Chem-Nuclear won't risk another venture like 1978, when it pursued another site on its own. That year, the company was forced to drop its efforts to obtain a license for a storage and disposal site in Cimmaron, N.M., and had to write off more than \$700,000 in development costs.

Still fuming, Johnson criticizes current NRC site development criteria—requiring selection of the best one of three (expensively) identified sites—as "pointless and ridiculous, particularly if you expect venture capital to do it."

What about potential locations? Chem-Nuclear has been discussing possible sites with officials in several states, but Johnson won't tip his hand about location until he has a site under option. He says, however, that there are good possibilities in New Mexico, Pennsylvania, Virginia and New York. The West Valley site, south of Buffalo and closed by New York in the early 1970s, "could and should be opened," he says. "It's very good technically—hydrologically and geologically."

In total, five to eight regional sites would be sufficient to handle the nation's low-level nuclear wastes, Johnson believes. More than that would raise costs, he says, because of the duplication of fixed costs—such as health physicists, quality assurance people, lab technicians and equipment operators—at each site.

The political problems associated with waste repository siting won't be aided much by advanced methods of reducing the volume of waste, Johnson believes. "States are just concerned with having to take lots of waste from other states."

If on-site storage becomes feasible, firms like Chem-Nuclear would package the waste, construct the needed facilities and manage them.

Despite the company's rosy future as a nuclear waste handler, the "Chem" in its name shortly will assume greater prominence. Although nuclear operations account for 65 percent of its business, the Resource Recovery and Conservation Act will boost its chemical handling business, eventually mak-

Making Money In Nuclear (Continued from preceding page)

ing it a larger earner. The act, which mandates stricter criteria for handling chemical and other hazardous wastes produced by industry, offers golden opportunities for a company with Chem-Nuclear's experience. The company operates one chemical disposal site already at Arlington in eastern Oregon and is pondering at least one

other in the eastern U.S. Says Johnson: "The market there is so much bigger...if we just maintain our market share we'll do pretty good."

In late July, however, the company's board of directors balked at authorizing a new stock issue to raise money to acquire new sites. But few expect this energetic company to be slowed for long. □

July 24, 1980

THE FUTURE OF THE HANFORD, WASH., NUCLEAR DUMP SITE MAY BE DECIDED this November in a voter initiative, if the Washington secretary of state determines that enough valid signatures have been submitted to put the measure on the ballot. If passed by the voters, the initiative would block the importation of nuclear waste into Washington for temporary or permanent storage, with the exception of waste generated by medical activity. The ban would take effect July 1, 1981. The initiative would also allow Washington to accept waste from states with which it may enter into regional storage agreements.

Supporters of the initiative say they are attempting to prevent the state from becoming the nation's "nuclear dump site." A spokesman for Don't Waste Washington, the organization behind the initiative, said that the group "wants to send a clear message to Washington, D.C., that the people of this state are not exactly eager to take all the waste that President Carter would like to send them because of other site closings or toughening attitudes in South Carolina and other dump sites."

A source at Nuclear Engineering Co. (Neco), which operates the Hanford burial site, denied that Washington "has ever been the dumping ground of the nation for nuclear waste." Neco, the source said, plans to conduct "a public information and education effort" to fight the initiative. "We want to allay the fears caused by the emotional efforts of the other side," the Neco source said. "We believe the site poses no safety problems and that it meets an essential need." Neco's operation of its other waste disposal site, at Beatty, Nev., would not be affected by the outcome of the Washington vote.

The Don't Waste Washington spokesman said one of the purposes of the initiative, win or lose, is to "stimulate discussion about the idea of regional sites." The spokesman said, "Undoubtedly, there are other adequate sites around the U.S." A Washington regional site, he said, would "probably not" extend any farther than the surrounding states of Oregon, Montana and Idaho.

The Neco source responded, "While we recognize the political necessity of establishing regional sites, the July 1 cutoff date is unrealistic. Interstate compacts require that identical legislation be passed by all states concerned. There must also be approval by Congress. Only then can site selection, environmental impact studies, regulatory requirement settings and the necessary public hearings begin. The whole process could take 5-8 years."

The initiative, commonly known as 383, after its filing number, may also pose difficult legal questions if passed. The Neco spokesman asked rhetorically, "Is the waste generated from the out-of-state manufacture of smoke detectors used in Washington actually out-of-state waste? And is the waste produced from the manufacture of radioactive medicines in Connecticut actually Connecticut waste, or is it Washington waste if the medicines are used in Washington? Also, is waste generated out-of-state for the production of electricity used in Washington in-state or out-of-state waste?" Initiative supporters tend to apply the strictest definition possible to 383, but are willing to await court decisions on such matters.

Such concerns, however, may be premature. While the initiative petitions seemingly were filed with a sufficient number of signatures to put the measure on the ballot, each signature must undergo scrutiny by the secretary of state in order to determine its validity. Only voters who voted in the last election for governor of Washington are eligible to sign, and 8% of those people — or 123,711 voters — must sign the petition. A total of 148,201 signatures were filed, leaving a margin of 16.5%. According to a source in the secretary of state's office, though, the rate of invalid signatures is running "at about 16%." While a final tally will not be arrived at for about four weeks, the source said, "whether the initiative gets on the ballot or not is anybody's guess at this point." Historically, Washington initiatives run an 8%-12% invalid signature rate, but in the case of 383 it appears that many younger voters who did not vote in the last gubernatorial election signed

July 17, 1980

NRC SETTING OUT TO ANSWER, 'WHAT IS LOW-LEVEL WASTE?'

NRC is in the process of eliminating low-level waste — not in fact but in definition. What will result from this undertaking is a set of criteria guiding NRC and applicants for waste disposal site licenses in dealing with the broad spectrum of radioactive waste long characterized as low level. The NRC strategy essentially is to characterize waste material by the means available for disposing of it, and one practical effect may be the establishment of burial sites reserved for specific types of waste sources, such as nuclear plants on the one hand and medical and research facilities on the other.

"Today we have the authority to license but we don't have the criteria," said an NRC source, noting that the 10 CFR 50 appendix F defines only high-level waste (as the solvent material left over from reprocessing) and that all other waste is considered low level. This lack of distinction has become particularly troublesome in the last year or so as the three states containing the only U.S. low-level waste burial grounds have expressed concern that relatively high levels of long-lived materials are being dumped at the sites.

This complaint is only one among many voiced by South Carolina, Washington and Nevada as they make out-of-state access to the facilities more difficult. The result has been increased state and federal attention on the need for additional sites, and NRC's realization that it lacks a sufficiently formalized licensing process. The NRC source said, "We're trying to do two things: head off complaints that there aren't any rules to the game, and we want to speed up licensing."

NRC has three performance objectives guiding establishment of low-level waste site criteria: that the site not require active maintenance for more than 100 years; that the accidental intruder be protected; and that the general population near the site not receive exposure above limits now being set by the Environmental Protection Agency. The criteria being developed will set minimum standards for achieving these objectives. "If you eliminate most of the long-lived elements and the transuramics, then the disposal means are there," said the NRC source. He added that the main concern with most material now characterized as low-level waste is the danger posed to accidental intruders, not public exposure or migration through groundwater, noting that "most isotopes are not prone to migration." The NRC criteria will seek to resolve how and where to dispose of, for example, technetium 99M, a highly active medical isotope with a half-life of six hours, 500 longer half-life and cannot be dealt with as easily as the medical isotope, which can be stored and then disposed of after its activity has decreased.

NRC's schedule calls for development of criteria to be completed by April 1981, to be followed by about a one-year rulemaking. License applications in the meantime, however, will be dealt with under guidelines set out in a draft document completed last November and by the evolving guidelines. While it is not all clear now, the NRC source believes the new rule may lead to the segregation of waste by source and, similar to the thinking of a DOE low-level waste task force, that less active waste would be managed by the states while more active material would come under federal authority.

NRC has no low-level waste site license applications pending. As one source noted, industry is loath to reveal plans for a specific site in advance of actually applying for a license because of the likelihood of public opposition. As for the states, Virginia appears to be moving about as quickly as any other in pursuing the possibility of establishing a new disposal facility. — *Rob Laufer*

ENVIRONMENT REPORT - CURRENT DEVELOPMENTS
(Bureau of National Affairs)

Apr. 25, 1980

Nuclear Energy

**GAO RECOMMENDS LICENSING MORATORIUM
ON NEW LOW-LEVEL WASTE BURIAL SITES**

The General Accounting Office March 31 recommended that a moratorium be imposed on the licensing of new low-level radioactive waste shallow land burial sites until the Department of Energy completes its national plan for the disposal of low-level wastes.

The plan, directed by President Carter in his February announcement of a national nuclear waste management program (Current Development, February 15, p. 1999), is expected to be completed by June 1981.

DOE and the Nuclear Regulatory Commission, which has licensing authority for low-level disposal sites, disagree with the GAO recommendation because they say it would hinder states in their development of new shallow land burial sites, as well as cause states to expect the Federal Government to solve the low level waste disposal problems.

The GAO study was requested by Congressman John D. Dingell (D-Mich), chairman of the House Interstate and Foreign Commerce Subcommittee on Energy and Power, to identify problems associated with low-level waste disposal, to determine responsibility for resolving the problems, and to evaluate the progress of Federal Government to resolve the problems.

Both NRC and DOE have made it clear to Congress that commercial disposal sites should be the responsibility of the states and not the Federal Government (November 16, 1979, p. 1524). In addition, the governors of the three states — Washington, Nevada, South Carolina — which currently have operating low-level waste disposal sites have called on all states to assume responsibility for their own low-level wastes (November 9, 1979 p. 1510).

In a separate but related study, GAO recommended that existing reactor sites be used to store and in some cases permanently dispose of low-level wastes. (See related story, p. 2340).

Recommendations

In the short term, GAO said NRC can alleviate the present disposal problem if its acts promptly in considering several basic questions. These questions are:

- ▶ What is low-level waste;
- ▶ Who are the generators of low-level waste and how much waste do they generate;
- ▶ Can the volume of low-level waste be reduced; and
- ▶ Is illegal dumping of low-level waste occurring?

With respect to the low-level waste management plan being developed by DOE, GAO said DOE should work with other federal agencies to assess the number, type, and general location of waste disposal sites that would be needed on a regional basis. In addition, GAO recommended that DOE define the federal versus state responsibility for low-level waste disposal; evaluate the feasibility of using existing DOE facilities for disposal of commercial wastes, and investigate the possibility of reopening the three closed commercial sites.

Contingency Plan to Use DOE Sites

Earlier, DOE issued a draft of its contingency plan stipulating steps NRC would have to follow in order to use DOE facilities for commercial low-level wastes disposal (October 12, 1979, p. 1355).

DOE said it is in the process of completing an environmental assessment of the contingency plan before it is finalized.

National Disposal Plan

In anticipation of the President's announcement in February, DOE initiated a national strategy document last summer and currently is preparing a full draft of the document which is expected to be released for public comment in July.

The strategy is based on South Carolina's recent action to limit the annual volume of waste accepted by the Barnwell site; it assumes that in 1982 the Hanford sites will not be accepting out-of-state wastes; it divides the country into the Northwest, Southwest, South, Northeast, and Midwest regions, and it defines a shallow-land burial site as having an operational life of 40 years and an annual capacity of about 1.2 million cubic feet.

Based on these assumptions, it is projected that a total of 2.25 additional sites will be required in 1980; 2.50 sites in 1982; 3.50 in 1984; 4.50 in 1986; 5.25 in 1988; and 6 additional sites by 1990.

Availability

Single copies of the report, "The Problem of Disposing of Nuclear Low-Level Waste: Where Do We Go From Here?," EMD-80-68, are available free of charge from GAO, Distribution Section, Room 1518, 441 G St., NW, Washington, D.C.

Apr. 21, 1980

166 MAXIMUM NUMBER OF NUCLEAR UNITS OPERATING BY 2000, NRC PANEL SAYS

The maximum number of nuclear units that could be operating in the U.S. by the end of the century is 166, representing 159 Gwe. This assumes that all units now in the licensing pipeline are completed, and is 99 units more than those currently licensed to operate. If those that do not yet have construction permits drop out there will be 155 units (146 Gwe) operating in 2000. If those units that have a construction permit but have not yet poured concrete are removed from the list the number of units operating by 2000 would be 135-140.

These are projections drawn up by the NRC caseload panel, which consists of seven staffers drawn from various offices. The panel develops caseload projections for use by the staff in budget preparation and longer-range program planning. Specific workload and manpower loadings based on the projections are developed by individual NRC offices. The projections in the panel's latest report (for FY-82-86) are based primarily on surveys of industry plans by the offices of nuclear reactor regulation and nuclear material safety & safeguards.

The report says that the time from CP application to commercial operation of a large reactor in the 1983-84 period "is, based on historical trends, expected to be about 15-16 years; thus any reactor application tendered after that time would not be expected to be in commercial operation by the year 2000."

In order to be operating by 2000 a utility would have to apply for a CP by mid-1984, said an NRC staffer, and that would mean placing an order for the unit by mid-1982. "We don't see a large turnaround in order rate by then," said the official. DOE and the reactor vendors are talking of possible orders in 1983 or '84. This would mean an application for a construction permit in 1985 or '86 and — allowing for the 15-16-year licensing process — the unit would not be in commercial operation until after the turn of the century, allowing a year for reaching commercial operation after OL issuance, the staffer said.

NRC believes that by 1985 there will be 113 units (98 Gwe) in commercial operation, including the present 67 licensed to operate. Toward the end of 1986 there are expected to be about 135 reactors (124 Gwe) operating or ready for fuel loading. Only one new CP application is expected to come in during the early to mid-1980s (the only plant currently on order for which a CP has not been sought is Commonwealth Edison's proposed Carroll County-1 and -2). Some 2-8 applications for OLs per year will be tendered to NRC during that period, the panel report says.

NRC expects DOE to apply for a high-level waste repository license by 1987 and NRC will be conducting site-characterization reviews in a variety of media throughout FY-81-86. Four additional away-from-reactor spent fuel storage facilities are expected to be licensed during FY-82-86, meeting a demand of about 5,000 metric tons by about FY-83.

By FY-86 there are expected to be 23 fuel cycle facilities under NRC licensing authority and about 10,500 radioisotope licenses. There will be up to nine licensed sites for low level wastes (including the three currently licensed sites — Barnwell, Beatty and Hanford), and NRC assistance on six other sites will be provided to agreement states, the panel forecasts.

Some 24 licensed uranium mills and about 70 additional licenses for other types of activities, such as solution mining and ore buying, are expected by FY-86. Transportation reviews will average about 55 per year throughout FY-82-86 and 300-400 shipments of radioactive material per year will require a safeguards review and will be monitored in transit, the panel says. About 400 material control and accounting reviews and about 500 physical security reviews for various fuel cycle facilities, power and nonpower reactors will be required each year.

Export and import licenses will average about 1,000 reviews per year throughout FY-82-86. About 15% are designated major cases requiring commission approval and another 15-20% require safeguards reviews, the panel reports.

Feb. 8, 1980

DOE PROPOSES EACH STATE IDENTIFY SITE FOR LOW-LEVEL NUCLEAR WASTE DISPOSAL

A DOE document detailing an approach for states to establish new regional low-level nuclear waste burial grounds recommends that each of the 50 states and the District Columbia be required to identify, characterize and possibly select a site for such burial grounds within its borders within specific time frames to be determined by Congress.

The document, which DOE sent last week to Rep. Mike McCormack, chairman of the House Science and Technology nuclear subcommittee, recommends this process begin as soon as the Nuclear Regulatory Commission establishes site selection criteria and Congress passes legislation giving states financial assistance, if necessary, and the authority to manage wastes on a regional basis.

Six to eight new sites needed. Six to eight new burial grounds will be needed regionally throughout the next decade, according to the DOE document. These sites should be established by regional groups of states or on a state-by-state basis, according to the DOE document, which advocated, however, that all states be involved in looking for suitable sites. The first of the six to eight sites, the document suggests, should be established as soon as possible in the Northeast and Midwest, where most of the waste is now generated, with remaining sites to be established regionally at one to two year intervals throughout the 1980s.

In strongly supporting the concept of regional sites, DOE said that shipping wastes long distances was "undesirable" because of increased costs and risk of accidents. Some eastern utilities are currently forced to ship wastes to burial grounds at Beatty, Nev., or Richland, Wash., because volume restrictions were imposed by South Carolina officials at the only other operating burial ground, at Barnwell, S.C. Legislation would be required for burial grounds established by regional groups of states, DOE officials said, to give the states the authority to refuse to take wastes at the site from outside the region.

DOE will take wastes in an emergency. The DOE document estimated it will take states "at least two years" to establish a burial ground and said that if an immediate need for disposal space emerged before new sites could begin operating, states should find interim storage facilities and take action to minimize waste generation and waste volumes ready for disposal. If interim storage could not be found, the document said, DOE would consider taking commercial wastes on an interim basis at its sites in states where governors would not object after NRC declared a state of emergency.

The document made the following additional recommendations and points:

- Establishment of regional sites should be a state responsibility, and DOE's role should be limited to providing technical planning and assistance.
- States should be allowed to co-locate nuclear waste sites with sites for other types of hazardous waste "where appropriate."
- Technology should be developed and implemented to reduce the volume of waste and provide alternatives to shallow land burial.
- States may need unrestricted federal grants for low level waste management.
- States should "be free" to collect "reasonable" waste disposal charges but should be prohibited from collecting charges for a perpetual care fund from institutions generating wastes with short-lived radioactivity.
- Twenty-four states generate low-level nuclear wastes from commercial power reactors and all 50 states and the District of Columbia generate both institutional and industrial low level nuclear waste.
- Nevada, South Carolina, and Washington, states where the only operating burial grounds are located, received 11%, 75% and 10% of the commercial waste generated in 1978 but facilities in those states generated only 2%, 6% and 1.5% (respectively) of that waste.
- Of the top 10 waste generating states - South Carolina, New York, California, Illinois, North Carolina, Pennsylvania, Florida, Massachusetts, Connecticut and Michigan - only South Carolina has an operating burial ground for disposal of such waste.

DOE comprehensive waste plan due in May. DOE officials said that the siting approach outlined in the document would be included in a comprehensive plan for low-level waste management to be released by the department in May, in response to a recommendation by the Interagency Review Group on waste management and a proposal in the House version of the FY-80 DOE authorization bill pending in Congress. Rep. McCormack asked DOE in October to immediately draw up plans for siting new burial grounds after safety concerns led to the shutdown of all but the Barnwell, S.C., burial ground.

Jan. 18, 1980

S. CAROLINA OFFICIALS SEEK TO RESTRICT DOE USE OF BARNWELL PLANT AS AFR

The South Carolina state legislature within the next several weeks will seek to prevent or delay DOE from establishing an away-from-reactor (AFR) nuclear spent fuel storage facility at Allied-General Nuclear Services' defunct reprocessing plant in Barnwell, S.C., according to state sources. DOE officials recently said they would like to rerack and license the Barnwell site to begin taking AFR spent fuel in 1984-85 (see related story, page 3).

According to state sources, two joint resolutions separately proposed in the legislature — one of which is expected to be approved in some form during the current legislative session — would make DOE use of the Barnwell plant as an AFR contingent on a two-thirds approval by the legislature or on substantial DOE progress in developing a high-level waste repository. Both proposals, said state sources, could restrict DOE actions to use the Barnwell site.

State legislators are showing strong support for the resolutions, state sources said, because they believe both of the proposals would prevent Barnwell from becoming a long-term AFR or the only such plant in the country by requiring DOE to develop a repository for disposal and other AFRs. State officials believe, sources said, that federal inaction on the waste program, in part, has been the cause of the state's having to take an unfair share of low-level waste at the Barnwell burial ground. State officials also cite lack of federal action for delays in solidification and disposal of high-level nuclear waste that has accumulated at DOE's Savannah River plant.

One of the joint resolutions, proposed by 41 state representatives, calls for the President and Congress to prohibit use of Barnwell as an AFR unless it is approved by a two-thirds majority of the South Carolina legislature and the governor. State sources said it would be extremely difficult to get two thirds of the state legislature to approve anything.

Another joint resolution proposed in the state Senate would link AFR storage at Barnwell to development of a disposal facility and is considered almost as restrictive as the House proposal, according to state sources. The Senate resolution urges the South Carolina congressional delegation to seek to amend any federal Barnwell-AFR legislation to guarantee that: 1. DOE will mandate interim spent fuel storage regionally throughout the U.S.; 2. South Carolina officials will be able to participate in all environmental and safety reviews of the Barnwell plant as an AFR; 3. spent fuel will be removed from the AFR for disposal after a 40-year storage period; 4. spent fuel stored at the AFR will be transported after 40 years of storage to an offsite "long-term dry retrievable surface storage facility" if a repository is not available; and 5. no AFR will be established at the Barnwell complex until DOE "obtains agreements from the legislatures and governors of host states that . . . [repository] sites may be explored and developed."

The fifth condition of the resolution is the most likely to delay use of the Barnwell as an AFR, according to state and DOE officials. Sources expect that DOE will have trouble getting states to agree to allow "development" of a high-level waste repository within their borders, given the difficulty DOE has had getting the states to agree to allow first-step exploration of candidate geologic media.

Sources also believe that a soon-to-be-announced presidential nuclear waste policy decision could further hinder DOE in seeking agreements for development of repository sites. In that decision, President Carter will delay DOE selection of repository sites until after DOE has qualified 4-5 potential sites in various geologic media and environments, according to DOE sources. This delay would push DOE site selection to 1984-85, and some sources are concerned that DOE could not obtain agreements from states for development of a site until then. But one DOE official said this week that DOE can sign such agreements with states any time before sites are officially selected.

Oct. 22, 1979

Nuclear Wastes

S.C.'s Riley Pushes A Debate

South Carolina's Gov. Dick Riley is going to fool around with nuclear wastes until he starts a real discussion. Good. Carolinians will be wiser for it.

Events in South Carolina last week suggest that the nation's leaders — in government and the nuclear industry — are likely to be drawn into the debate. The result could be a clear national policy on nuclear wastes, an achievement Gov. Riley could be proud of helping to bring about.

Right now, not even scientists can agree how to manage wastes, how dangerous they are or even how long they must be isolated from people and the environment. But they agree that wastes present a problem requiring special care.

Essentially, that's what the discussion in South Carolina was about: how careful the nuclear industry must be in disposing of wastes, and how much the government must spend to assure that wastes are disposed of properly.

Early last week, Gov. Riley forbade an Illinois firm from sending more low-level nuclear wastes to South Carolina for disposal. He said the company has a history of sloppy waste shipments, and the ban would demonstrate the tough approach he is taking with a nuclear industry previous state officials had courted.

But later in the week, state officials

acknowledged they had stopped full-time inspection of waste shipments to the state's burial site at Chem-Nuclear Systems Inc. near Barnwell. Regular state inspections were begun last April, shortly after the accident at Three Mile Island. They were stopped because there weren't enough inspectors to monitor the site six days a week, from 7 a.m. until 6 p.m.

David Reid, Gov. Riley's energy aide, acknowledged Friday that the less frequent schedule of inspections could be unsettling. But he said Gov. Riley's ban early in the week was aimed at a company which had not lived by the rules.

That isn't the case with Chem-Nuclear, which inspects every shipment it accepts, he said. The state's periodic inspections will ensure that Chem-Nuclear also continues to live by the rules. But right now, officials have no problems with the company. "If we did, we'd shut them down," he said.

But the problem brings home a debate rising nationwide over how much inspection is needed and who should provide it. To that end, Gov. Riley and the governors of Nevada and Washington will meet with experts at the Nuclear Regulatory Commission Nov. 6 to press for federal commitments to work with the three states now handling all the nation's low-level wastes. Let the debate continue.

U.S. NUCLEAR REGULATORY COMMISSION, OFFICE OF PUBLIC AFFAIRS

Aug. 14, 1979

**NRC ISSUES BULLETINS TO LICENSEES
ON PACKAGING OF LOW-LEVEL WASTES**

The Nuclear Regulatory Commission has issued bulletins to all 8,000 of its licensees directing those that generate low-level radioactive wastes to take certain actions to ensure that the wastes will be properly packaged for transport to burial sites in three states.

Governors of the three states with operating low-level waste burial sites--Nevada, South Carolina and Washington--have expressed concern about enforcement of rules governing packaging and transportation of these wastes. The NRC action is in response to those concerns.

Locations and operators of the sites are Barnwell, SC, Chem-Nuclear Systems, Inc.; and Beatty, NV, and Hanford, WA, Nuclear Engineering Company, Inc.

Problems that have occurred include contamination, leaking, improperly loaded and improperly labeled packages. This has led to incidents such as fire and contamination of vehicles.

Out of 43 shipments of low-level wastes to the Barnwell facility, 63 deficiencies were observed by the State of South Carolina during a package inspection program from April 10, 1979 to July 5, 1979. The shipments were from reactor, medical, industrial and military facilities.

The NRC staff warned that Governors of the three states with licensed burial facilities have indicated that, if the situation is not rectified, they may have to initiate actions that would deny use of the three burial sites by violators.

Under the NRC directive, affected NRC licensees must:

- (1) Maintain a current set of NRC, Department of Transportation and State regulations and requirements involving transfer, packaging and transport activities for low-level wastes;
- (2) Designate persons in their organization who are responsible for these activities;
- (3) Provide detailed instructions and operating procedures to all personnel involved in these activities;
- (4) Provide training and periodic retraining to personnel involved in these activities to keep them aware of regulatory and waste burial license requirements and to ensure that the volume of waste is minimized and is processed into acceptable chemical and physical form for shipment to the burial site; and
- (5) Establish a management-controlled audit function for all transfer, packaging and transport activities, with the first audit to be performed within 60 days of the NRC bulletins.

Aug. 23, 1979

Nuclear Energy

**NRC DIRECTS 8,000 LICENSEES
TO BEGIN AUDITS ON WASTE HANDLING**

The Nuclear Regulatory Commission (NRC) directed those of its 8,000 licensees that generate low-level radioactive wastes to take steps to ensure that wastes are packaged properly for transport to burial sites in three states and to begin management-controlled audits on those steps.

The action was taken in response to concerns expressed by governors of the three states where burial sites are operated. The sites are located at Barnwell, S.C.; Beatty, Nev.; and Hanford, Wash.

Governors Robert List of Nevada, Richard Riley of South Carolina, and Dixy Lee Ray of Washington July 10 demanded of then-Transportation Secretary Brock Adams and NRC Chairman Joseph Hendri that the packaging and shipment of waste materials be "drastically improved."

The governors explained that their action was prompted by "serious and repeated disregard for existing rules governing the shipments of commercially generated low-level nuclear wastes and the total lack of corrective measures by the NRC." They said a new plan "must be submitted by the federal agencies no later than August 1, 1979" and must go into effect one month later. Such a plan "must include the following components:"

- ▶ Dispatch of a trained team of inspectors to perform regular site inspections of both the source generators and the collectors of nuclear waste. The inspections must include the opening of containers.

- ▶ Provide detailed instructions and operating procedures to all personnel involved in such activities.

- ▶ Provide training and periodic retraining to personnel involved to keep them aware of regulatory and waste burial license requirements and to ensure that the volume of waste is minimized and is processed into acceptable chemical and physical form for shipment to the burial site.

- ▶ Establish a management-controlled audit function for all transfer, packaging, and transport activities, with the first audit to be performed within 60 days of receipt of the bulletin.

Oct. 11, 1979

Nuclear Energy

**GOVERNOR CLOSES HANFORD, WASHINGTON,
STORAGE FACILITY FOR RADIOACTIVE WASTE**

A privately operated facility for the storage of low-level radioactive waste was closed October 4 by Washington Governor Dixy Lee Ray.

Her action stemmed from the fact that seven out of nine truckloads entering the state in the previous three days were "found to have equipment defects or radiological defects," an aide to the Governor said. Another state official told EUR October 5, "It is really not a health and safety issue so much as a packaging issue and a matter of principle."

In July, Ray, along with the governors of Nevada and South Carolina, demanded of the Nuclear Regulatory Commission and the Department of Transportation that the packaging and transport of waste materials be "drastically improved" (315 EUR 13).

South Carolina receives 80 percent of all U.S. low-level waste, with Washington and Nevada accounting for the other 20 percent. The waste includes used uniforms and supplies, primarily from medical and educational institutions. About 200,000 cubic feet of such waste was stored by Nuclear Engineering Company at Hanford last year.

An aide to Ray told EUR October 5 that NRC Chairman Joseph Hendrie and the governor had spoken. He concurred in her action and said, "the ball is in our court now." Hendrie told Ray that NRC would notify all licensees of the action and would set to work immediately with the Department of Transportation on another review of procedures.

He agreed with Ray's comment that "the NRC staff is too busy with 'what ifs' and testifying to Congress to try to take care of regular routine work."

The governors of the three states earlier agreed that if one state refuses entry, the other two also would refuse to receive the affected material.

NOVEMBER WEEK
Oct. 11, 1979

REGIONAL LOW-LEVEL WASTE BILL DRAFTED; HANFORD CLOSED, BEATTY THREATENED

While one of three U.S. low-level nuclear waste sites was shut down last week and another was being threatened with closing this week, legislation is being readied in Washington to create about a dozen regional facilities to handle the nation's increasing load of low-level waste.

The bill is being drafted by the staff of Rep. Mike McCormack (D-Wash.). Although still in the drafting stage, the bill will aim to make the U.S. regionally self-sufficient in low-level waste disposal, a concept voiced with growing vehemence by Washington Gov. Dixy Lee Ray who last Thursday (Oct. 4) closed the Hanford, Wash., burial ground because of leaking shipments and defective vehicles. Ray, who asked her state's congressional delegation to push for a national solution to the low-level waste problem, has been a strong critic of those states which are blocking disposal within their borders.

As it stands now, the McCormack bill would require states to provide land for disposal facilities on a regional basis, with the National Electric Reliability Council's nine regions possibly serving as a guide, according to sources.

Other features of the bill are likely to include charging DOE with responsibility for perfecting incineration technology to limit generation of waste, giving NRC licensing authority, and creating a structure whereby generators of waste assume the costs of the facilities. The bill will not designate specific sites, sources said.

As for Ray's closing of the Hanford site, the action was taken after seven of nine shipments received over a three-day period were found to have either packaging or vehicular defects. Officials from the federal Department of Transportation and NRC were expected to meet with Ray by the end of this week to convince the governor that the two agencies will increase their scrutiny in inspecting low-level waste shipments.

Ray was criticized by NRC for what she said was her staff's inability to contact anyone at NRC until midnight last Wednesday (Oct. 3) after hours of repeated calls. NRC chairman Joseph Hendrie, meanwhile, told Ray he concurred with her action in closing the Hanford site.

Ray permitted all shipments in transit at the time of the shutdown to complete their journey to Hanford. However, the governors of South Carolina and Nevada, the other states with operating low-level waste facilities, said they would prohibit shipments ordinarily intended for Hanford.

A spokesman for Nuclear Engineering Co., which operates the Hanford and Beatty, Nev. sites, said some 30 shipments regularly received at Hanford each week would therefore be denied any burial space. Continuation of this situation could threaten the operation of some facilities, such as hospitals, which generate low-level waste, the spokesman said.

The picture is further muddled by a temporary restraining order being sought by a newspaper, the Las Vegas Sun, to close Neco's Beatty operation because of alleged mismanagement there and at other facilities Neco has operated. The restraining order, scheduled to be ruled on by a federal District Court judge this week, follows a suit brought by the newspaper to permanently shut down the facility. A source at the newspaper said it is pursuing the action because "our responsibility goes beyond editorializing." Neco denies all charges brought in the suit.

The Beatty site is also being threatened by the state, which closed it for several weeks in July after leaking shipments were discovered. A hearing is scheduled in Carson City, Nev., Nov. 28 by the state Board of Health on continuation of Neco's license to operate the facility. — Rob Laufer

NUCLEONICS WEEK

Oct. 18, 1979

NRC STAFF IS PUSHING UTILITIES TO DEVELOP REGIONAL BURIAL SITES for low-level nuclear waste, suggesting that there could be collective action for both the construction and operation of such facilities. The staff also plans to publish proposed draft criteria for low-level waste disposal in an early notice of rulemaking in the next two months — months earlier than originally expected.

NRC thus is trying to overcome waste-disposal problems which rapidly are assuming crisis proportions. Washington Gov. Dixy Lee Ray recently closed down the Hanford burial ground because of sloppy shipment practices. The Beatty, Nev., site has been threatened with shutdown by officials of that state. And higher disposal fees and volume restrictions have been imposed by South Carolina officials at Barnwell, the only other burial site in the U.S.

The current dilemma, says one source, is viewed by NRC as a potentially serious health and safety problem. The staff, therefore, wants to see new low-level waste burial capacity made available. "We're exploring ways by which NRC can facilitate development of more regional capacity . . . but we have to stop short of being a promoter," says the source, and at this point NRC is just talking to utilities about the idea.

In addition, the staff is trying, with release of the proposed new criteria, to provide state officials with greater assurance of the adequacy of existing sites. The low-level waste disposal criteria, to be promulgated as 10 CFR part 61, were to have been proposed in draft form for comment in mid-1981 and put into final form in early 1982. Those dates still hold, but the staff has decided to come out with an advance notice of rulemaking to give prospective new site owners and operators an idea of what NRC will be expecting.

Oct. 19, 1979

Nuclear Energy

WASHINGTON GOVERNOR MEETS WITH NRC, DOT TO DISCUSS WASTE DISPOSAL SITE SHUTDOWN

SEATTLE, Wash., — (By an Environment Reporter staff correspondent) — Washington Governor Dixy Lee Ray October 16 met with officials from the Nuclear Regulatory Commission and the Department of Transportation to discuss her closure two weeks ago of the nuclear waste disposal site on the Hanford reservation.

Ray shut down the site when state and federal inspectors discovered three out-of-state trucks carrying low-level nuclear wastes to Hanford had defective equipment or leaking containers (Current Developments, October 12, p. 1352).

In discussions with NRC and DOT officials this week on how to get the disposal site reopened, Ray said she would meet again with the agencies November 6 to present a proposal — from the three states that receive commercially generated wastes — to improve safeguards for shipping wastes:

According to Anna Peterson, assistant press secretary to the governor, Governors Ray, Robert List of Nevada, and Richard W. Riley of South Carolina, will suggest to NRC and DOT that all states sending low-level wastes beyond their borders to those three states be required to certify the safety of the waste packaging.

The states would have to share responsibility for the packaging under the state certification program, Peterson October 16 told Environment Reporter.

Very few states now have such certified agreements with the receiving states, she said.

The Hanford disposal site will remain closed until at least the November meeting, according to Peterson. In the meantime, NRC and DOT are expected to develop specific safeguards for shipping of low-level radioactive wastes. The agencies have already agreed to increase inspections to

make sure that shippers are packaging the materials properly at the generating site, Peterson said.

The meeting between Ray and federal officials was basically informational, she said. Also attending were representatives from the Washington State Energy Office; Energy Facility Site Evaluation Council; Department of Social and Health Services, which participated in the inspections leading to the disposal site shutdown; the Washington State Patrol, which also inspected the trucks; and the University of Washington radiology department. The university is the largest generator of low-level waste in the State of Washington but will be able to store its own wastes until November 6, according to Peterson.

State Inspections, Checkpoints

When trucks carrying nuclear works begin rolling toward the Hanford site again, they will have to enter the state at one of two ports of entry, under new rules adopted by the state's Hazardous Materials Advisory Committee.

Captain Larry Hart of the Washington State Patrol said the regulations, which took effect October 10 on an emergency basis, will require shippers of radioactive wastes to enter the state at Spokane in eastern Washington and Kennewick, located in south central Washington near the Hanford Works.

The trucks will be inspected at those points and the drivers will be given inspection records which they must present to the Nuclear Engineering Company, operator of the Hanford disposal site.

Hart said the state patrol is basically concerned about safety of the equipment on the trucks rather than their contents, although inspectors from the patrol will check each load with radioactive monitors.

The patrol already has trained inspectors on site at the ports of entry, he said.

The reason for adopting the rules, which will become permanent within 60 days, is to "direct traffic" — of trucks carrying radioactive loads — into the two ports of entry, Hart said. About 90 to 95 percent of trucks bound for Hanford now pass through those ports, he said.

Hart also said he had received a letter from the state patrol in South Carolina — home of one of the two other such disposal sites in the U.S. — asking for information on Washington's inspection program.

Oct. 22, 1979

DOE WILL SPEED LLW CONTINGENCY PLAN IF COMMERCIAL UNITS ARE SHUT DOWN

DOE would consider quick implementation of a draft contingency plan for accepting commercial low-level wastes (LLW) at its own sites, even before formal adoption of the plan, should state actions restrict shipments to the three operating commercial facilities, agency sources say. DOE has moved up its timetable for considering the draft plan and is being pressured informally by NRC to complete consideration of the contingency plan, in light of actions or threats of actions in the three states with commercially operating low-level waste repositories.

The state of Washington has temporarily shut down the facility at Hanford; Nevada is considering similar action against the Beatty site; and South Carolina is stiffening policies on receipt of material at the Barnwell site, which already bans certain wastes and has limited capacity. The actions result from increasing disquiet about the quality and condition of transported wastes.

"I suspect the draft plan is in good enough shape" that "it could be moved through very quickly," should restrictions on deliveries to the commercial facilities leave the wastes without a place to go, according to a DOE source. The draft, about a year in the making, was to be forwarded last week from DOE's Idaho operations office to headquarters waste management officials for internal review. A normal timetable envisions shipment to NRC for review, then final adoption by DOE, but sources stress it could be put into effect on an emergency basis if NRC determines there is a threat to health and safety and no alternative exists to shipping the waste to a DOE-run site.

NRC asked DOE about a year ago to develop "contingency options which would allow DOE burial sites to accept commercial LLW," a summary of the DOE draft plan states. "NRC could request implementation of the options in the event it determines that public health and safety is endangered and no alternative exists . . . until longer range solutions can be found. . . . These options would provide a short-term response if the three commercial burial sites were to experience operational problems or were closed for other reasons."

The DOE draft contingency plan stakes out a two-phase approach -- phase 1 would center on NRC efforts to find non-DOE alternatives to waste disposal at the commercial sites; phase 2 would be an NRC request for DOE acceptance of the waste if phase 1 alternatives were not available. Under the DOE approach, NRC would be expected to determine first if: 1. waste generators can use on-site storage or central storage facilities if disposal sites are not available; 2. states, individually or collectively, can provide interim storage or disposal alternatives; 3. Environmental Protection Agency disposal technologies, "such as sea disposal," are available; and 4. accelerated NRC licensing can ease the problem. "If this process does not produce adequate solutions," a summary of the DOE draft says, "and NRC finds that public health and safety is jeopardized, NRC, in conjunction with the states, can request that DOE accept the wastes at its sites."

Several factors complicate the situation, DOE and NRC sources say. First, something less than complete shutdown of the three commercial units could force the issue. For example, if the Hanford unit were to stay closed and Beatty were shut down, certain materials, such as liquid scintillation waste, would have no home since they are barred at Barnwell. Also, Barnwell has only limited capacity. Second, while DOE has six waste-receiving sites, three (Oak Ridge, Los Alamos, and Idaho) have "such limited capacity" that they probably couldn't receive commercial waste. And third, the three DOE facilities that could receive waste on an emergency basis are near the three commercial facilities and may be subject to similar pressures. For example, while the DOE sites are not directly subject to state jurisdiction, the governors of those states could restrict transportation to these sites or insist on inspection of all shipments at the state border.

In its summary of the draft contingency plan, DOE said that "to complete the development of options for handling commercial LLW" it also is studying capacities at the sites, potential for expanding disposal space, "other programs on the sites that might be adversely affected by substantial amounts of incoming wastes, and the institutional problems which might arise in transferring and transporting the wastes." Also, DOE is studying "what regulatory and/or legislative procedures it would recommend may be necessary to enable DOE to take the commercial waste." In line with Interagency Review Group recommendations on low-level waste management, "DOE is working with the other involved organizations to determine the number, type, general location and disposal techniques needed for low-level wastes."

STATE HEADLINES
(Council of State Governments)

Nov. 2, 1979

Storage capacity for low-level radioactive waste from hospitals, laboratories, and nuclear-powered generating plants virtually vanished during the week as NEVADA Governor Robert List closed one site and SOUTH CAROLINA Governor Richard Riley restricted that state's site to half-volume receipts. WASHINGTON Governor Dixy Lee Ray had ordered the nation's only other low-level waste site closed earlier.

INSIDE D.O.E.

Oct. 12, 1979

DOE WANTS OTHERS TO ACT FIRST ON LOW-LEVEL NUCLEAR WASTE DUMP SHUTDOWNS

A DOE draft contingency plan states that the department should not accept commercial low-level wastes at its defense facilities in the event of a shutdown of existing commercial dumps unless other bodies, such as state governments, the Environmental Protection Agency and the Nuclear Regulatory Commission, can't solve the problem by other means, including disposal of the waste in the ocean, according to DOE sources.

The sources said the draft contingency plan, prepared by DOE's Idaho operations office, outlines the following steps that should be taken first before NRC asks DOE to accept the wastes:

- Waste generators should determine whether they can store wastes on site or at a central storage facility;
- States should determine "individually or collectively" whether they can provide interim storage or disposal alternatives;
- EPA should determine whether disposal techniques "under its purview, such as sea disposal" can be made available;
- NRC should determine if it can accelerate licensing of any pending low-level burial site applications.

NRC asked DOE in April to develop a contingency plan for accepting the wastes, warning that the Nuclear Engineering Co. (Neco), which operates two of the three remaining commercial low-level disposal sites, might go out of business as the result of a lawsuit brought by an Illinois state agency against the firm (Inside DOE, 7 May, 8). Neco, which operates facilities at Beatty, Nev., and at Hanford, Wash., was sued by the Illinois Dept. of Public Health for allegedly abandoning a low-level dump site at Sheffield, Ill. The third remaining low-level site, a Chem-Nuclear facility at Barnwell, S.C., has had state limits imposed on the amount of waste it can accept, NRC sources pointed out.

The Idaho field office now is examining what regulatory procedures or legislation would be necessary for DOE to accept the commercial waste and is drawing up a number of scenarios for potential commercial site shutdowns and the ability of DOE facilities to accept the waste, according to DOE sources. DOE is studying the capacity for low-level disposal on its sites, the potential for expanding that capacity and the institutional problems in transferring and transporting the waste, the sources said.

ENVIRONMENT REPORT - CURRENT DEVELOPMENTS
(Bureau of National Affairs)

Nov. 9, 1979

Nuclear Energy

**NRC, GOVERNORS SAY ALL STATES
SHOULD BE RESPONSIBLE FOR OWN WASTES**

The Nuclear Regulatory Commission and the governors of Washington, Nevada, and South Carolina November 6 called on all states to assume responsibility for their own low level nuclear wastes, and said that medical facilities should ensure that their radioactive materials are properly packaged and shipped.

Acknowledging the shortage of low level waste disposal capacity in the U.S., NRC Chairman Joseph M. Hendrie said the three sites currently operating get all the wastes, and this poses an "unfair and unreasonable situation for them." On the other hand, 47 other states enjoy the benefits of nuclear medicine and research and therefore should accept responsibility for the waste generated, he said.

The three governors, Dixie Lee Ray of Washington, Robert List of Nevada, and Richard Riley of South Carolina met with Hendrie to discuss disposal problems which have resulted in the recent closing of the Hanford, Wash., site and the Beatty, Nev., site.

The Hanford site was closed October 4 by Ray because of improper packaging and shipping of radioactive materials (Current Developments, October 12, p. 1352). The Beatty site was closed three weeks later after radioactive barrels were found outside the fenced area. In addition to closing the Beatty site, List also ordered the temporary suspension of the operating license of Nuclear Engineering Co.

Barnwell now is the only site open to accept wastes. Overall, it accepts and disposes of about 85 percent of the wastes generated in the U.S. With the other two sites closed, Barnwell has refused to accept any wastes that ordinarily would go to those sites.

'Number One ... Now Only One'

Commenting on Barnwell, Riley said the site has had the "unfortunate classification of being number one for a number of months and now has the classification of being the only one." He said he is going to push for each state to have its own disposal site.

"It makes good sense for each state to be responsible for its own wastes. The technology involved in low level waste disposal is not high technology and could be handled by every state, if necessary. The reason why every state doesn't is political — it's as simple as that," he said. "No state is going to take the opportunity to develop its own site unless it is required to do so."

In an effort to reduce the unfair burden on his state, Riley said, the Chem-Nuclear license has been amended to decrease the monthly volume of low level wastes that are accepted at Barnwell. In two years the total yearly volume will be reduced from 2.4 million cubic feet to 1 million cubic feet. In addition, he said, the state has proceeded to adjust the price for waste from \$0.16 per cubic foot to its current price of \$0.55 per cubic foot, with an eventual adjusted price of \$1 by April, 1981.

Hendrie Promises Federal Assistance

Hendrie told the press conference that he had asked Governor Ray to give serious consideration to opening Hanford while the commission works on getting new sites developed on a regional basis.

He said the Federal Government is committed to assisting states to enforce shipping and packaging regulations, and to train state personnel.

However, in order for the Hanford site to reopen, Ray said a permitting system for generators will have to be developed. Also, state inspections at state borders and onsite will have to be carried out, as well as proper training of state personnel, she said.

List, on the other hand, said he intends to keep the Nevada site closed, and will stand behind the requests that NRC follow-up on its commitments.

"I hope the White House, Congress, and other federal agencies will recognize the seriousness to develop a failsafe policy" for low level waste disposal, he said, adding that such a policy is possible.

Nov. 30, 1979

DOE PLAN STRESSES NEVADA, RICHLAND FOR EMERGENCY NUCLEAR WASTE DISPOSAL

A DOE draft contingency plan emphasizes consideration of DOE sites at Richland, Wash., and the Nevada Test Site (NTS) for DOE storage or disposal of commercial nuclear low-level wastes if states fail to provide interim storage or new disposal sites for the wastes in time to avert a predicted mid-1980 critical shortage of commercial burial ground, DOE sources said this week.

DOE officials, sources said, are convinced that the shortage of commercial low-level nuclear waste burial ground will become critical beginning next summer, threatening the shutdown of some eastern utilities and hospitals, which would have no place to take the low-level wastes they generate.

If states fail to take action to alleviate the problem and the Nuclear Regulatory Commission orders licensees to take wastes to federal sites, DOE's draft plan, expected to be approved by DOE next month and submitted to NRC for review in January, calls for consideration of the following options: 1. storage of wastes at DOE facilities in Richland, Wash., and/or the NTS; 2. burial of wastes at Richland and/or NTS; 3. burial of wastes only at NTS; 4. burial of wastes at Richland and/or NTS with limited burial of some types of wastes at DOE's Savannah River site; 5. storage of wastes at Richland, NTS or Savannah River; and 6. storage of wastes at any of DOE's six storage/disposal sites.

DOE is equipped to store and dispose of low-level nuclear wastes at Idaho National Engineering Laboratory, Oak Ridge National Laboratory and Los Alamos Scientific Laboratory, but DOE sources said that only sites at Richland, NTS and, to some extent, Savannah River have the capacity to handle commercial wastes.

DOE's emphasis on emergency use of its Richland and NTS sites comes at a time when Washington and Nevada governors have already closed or restricted commercial sites in their states to some incoming wastes and do not want those wastes going elsewhere in the state to DOE sites. Nevada officials have warned that the state might sue DOE if it accepts commercial waste at NTS or other DOE sites (Inside DOE, 2 Nov. 1). DOE's proposed policy for implementing the contingency plan, sources said, is for DOE not to overrule a governor who objects to DOE's bringing in commercial out-of-state waste to a DOE site in his state.

The contingency plan proposes more stringent criteria for acceptance of commercial waste and higher storage/disposal fees relative to the commercial burial ground criteria and fees. DOE would apply the more stringent criteria that it uses for its own wastes at its sites, one source said, and this would mean that DOE would not accept any liquid low-level commercial wastes. If DOE received improperly packaged waste, the source said, the draft plan calls for DOE to return it to the generator at his expense for proper packaging. DOE has estimated that \$10/cu. ft. of waste would be a "ballpark figure" for the fee it would charge commercial users for full recovery of storage/disposal costs. This would include \$1-2/cu. ft. of waste for a fund for perpetual care and maintenance of wastes at the DOE site.

DOE sources said states have until next year to find interim storage space or new disposal sites. The recent reopening by Gov. Dixy Lee Ray of the Hanford, Wash., commercial low-level nuclear waste burial ground will postpone a critical shortage of disposal space from December to next summer, DOE officials said. The Hanford site has a capacity of about 95 acres of potential disposal space but DOE officials do not expect the site to relieve the acute shortage for the following reasons: 1. low-level waste generators in the East, where 80% of the waste is generated, will not pay tremendous costs to ship their wastes to Hanford; 2. the Hanford site is not geared to handle large volumes of incoming wastes; 3. the number of nuclear waste shipments in the U.S. would double or triple, DOE sources said, if eastern waste generators used the Hanford site, probably sparking intense public protest; 4. it is not expected that the Beatty, Nev., commercial burial ground will reopen; and 5. South Carolina officials are beginning to restrict volume intake at the only other operating commercial burial ground, at Barnwell, S.C., as the amount of waste generated steadily increases. A critical shortage of disposal space will become evident next summer, the officials said.

DOE is drawing up a plan to help facilitate the establishment of regional sites, at the request of Rep. Mike McCormack, and while the plan is not to be completed until late next month, one source said that it probably would set up procedures whereby DOE would assist states in characterizing potential waste disposal sites. Said one DOE official who expects states to take action and does not expect DOE will have to implement the contingency plan: "We'll probably just be whistling Dixie." — Lynn Stevens

FUR FLIES OVER LOW-LEVEL NUCLEAR WASTE

By Ann MacLachlan

If the low-level nuclear waste burial ground at Hanford, Wash., is not re-opened within days, "it may never be opened," because political pressures on Governor Dixy Lee Ray will be too great. This is the assessment of James McCabe, an attorney who represents the state of Washington in the nation's capital.

Ray closed the burial ground, operated by Nuclear Engineering Co., on October 6 after a series of violations of transportation and packaging regulations by nuclear waste shippers. McCabe claims it was the only reasonable action open to Ray, given public sentiment within the state, a tough election approaching next year, and the failure of the federal government to respond adequately to requests for help with waste inspections.

After Ray and two other governors sent an ultimatum to Washington on low-level burial in July, "we got a response within eight days of all these wonderful things [federal agencies] were going to do," said McCabe. However, most of the things — like spot inspections of packages by NRC experts, or periodic reports on low-level initiatives — have yet to materialize, he added. "We have been horsed around on this so long we're a little gun-shy," he told *The Energy Daily* on Thursday.

The Nuclear Regulatory Commission staff has written Ray to outline what it is prepared to do to encourage reopening of the burial ground. But McCabe said this isn't enough: he wants letters from the Departments of Energy and Transportation as well. And he also feels it's "not asking too much" to get guarantees of federal action from the White House (not yet forthcoming).

According to NRC's William Dircks, director of the office of Nuclear Materials Safety and Safeguards, the federal government is offering Ray "less than five" full-time experts and an unspecified amount of financial assistance to help train state inspectors for the Hanford field. The federal personnel also would fill in with inspection and enforcement duties until the state people could be so qualified. Ray has indicated that if she gets adequate help from the federal government, she will be willing to reopen the Hanford site, at least for medically generated wastes. The problem is not so acute for low-level wastes from nuclear power or fuel cycle facilities, since these usually have some room for on-site storage.

At the moment, the nation's three major commercial low-level burial grounds are pretty much in limbo. The other two active sites — at Beatty, Nev., and Barnwell, S.C. — are not available for new customers; and Beatty is shut down completely pending the outcome of a hearing November 28, before a state appeals panel. A waste treatment company in Texas, however, has agreed to take liquid medical waste.

In the long run, however, it has become clear that a national solution to low-level waste storage must be worked out. Ray and fellow governors from Nevada and South Carolina, testifying before a House subcommittee on Wednesday, stressed that each of the 50 states is responsible for wastes generated within its borders. However, for practical purposes, the more likely outcome will be regional disposal centers, probably including Hanford and possibly Barnwell but not limited to them.

Gaining far less enthusiasm is a proposal by Rep. Mike McCormack (D-Wash.) to have the federal government provide 12 low-level waste burial sites on federal land. This proposal was turned into a study in DOE's 1980 authorization bill, but McCormack has introduced it again as a separate, more detailed bill this week. However, the governors testifying at Wednesday's hearing before McCormack's research subcommittee of the House Science Committee indicated they would rather see state management of radwaste disposal sites. One fear on their part is that a federal low-level waste program would be as successful as the federal high-level waste management program, which has gotten almost nowhere despite years of work.

In a related development, the Department of Energy has stopped shipments of low-level wastes from its research and defense-related facilities to commercial burial grounds. They will now be shipped to existing DOE low-level burial grounds, including Los Alamos, N.M., Idaho Falls, the Nevada Test Site, Hanford, and Savannah River, S.C. DOE had planned to ship about 450,000 cubic feet to commercial sites during 1979 — some 18 percent of the total amount expected at the commercial sites this year. The agency said it hopes the new policy will help make room in the commercial sites for medical and industrial low-level wastes.

NRC and the Federal Emergency Management Agency also are working out procedures in case of an emergency need to ship commercial nuclear waste from the site where it was produced. Federal officials say the use of DOE burial grounds is "at the bottom of the list"; they hope to convince state governments to allow wastes to be held within the state on a short-term basis.

Nov. 2, 1979

STATES STRONGLY OPPOSE DOE TAKING LOW-LEVEL NUCLEAR WASTE AT FEDERAL SITES

State officials strongly opposed the idea of DOE taking low-level nuclear waste on DOE reservations when that possibility was raised last week as a solution to the lack of disposal space, caused in part by the Oct. 24 shutdown of the commercial nuclear waste burial ground at Beatty, Nev.

One governor even threatened to sue DOE for such action, arguing that a DOE takeover of newly-generated wastes would not solve safety problems, which had caused commercial site shutdowns. Shutdown of the Beatty site left only the Barnwell, S.C., burial ground open in the nation for disposal of utility and hospital-generated wastes. And it was expected that South Carolina Governor Richard Riley would announce volume restrictions for the Barnwell site Oct. 31, sources said, that would limit intake at the site by 50% over the next two years.

When it was reported that DOE and other federal officials in a special Oct. 24 meeting were considering taking the commercial wastes at DOE sites, Nevada Governor Robert List sent a telegram to the White House warning President Carter that he would "vigorously oppose such action," sources said. What List meant, one state official told *Inside DOE*, is that Nevada "will go to court" if DOE takes commercial waste into the Nevada Test Site or any other federal site.

Gov. List's and other governors' primary concern with DOE's accepting commercial waste, sources said, is that the action will not eliminate health and safety problems that have led to the commercial site shutdowns and will only result in the shifting of low-level nuclear waste intake from one site to another in the three states with commercial burial grounds. Commercial burial grounds are in Beatty, Nev.; Barnwell, S.C., and Hanford, Wash., and three of the six DOE reservations under consideration for commercial disposal are the Nevada Test Site, Savannah River, S.C., and Hanford, Wash. In the state of Washington, the commercial and federal sites are a mere one mile apart, state officials there said.

One Nevada official raised additional state concerns, saying that the states "would view this action [DOE taking commercial waste] as subverting the states' rights with respect to regulatory authority and with specific regard to the safety, health, and welfare of our [state] citizens."

The states' concerns and warnings, said one federal source, were factors in the decision by DOE attorneys last week that DOE could only accept commercial waste on its sites in the event that NRC declared that a national health and safety emergency existed because of the unavailability of commercial disposal space.

But Gov. List is preparing, sources said, to make it clear at a Nov. 6 meeting between NRC chairman Joseph Hendrie, Dept. of Transportation officials, and Govs. Riley and Dixie Lee Ray (from Washington) that he will still oppose DOE taking the waste in an emergency situation.

List, said a Nevada official, will insist at the Nov. 6 meeting that federal officials declare safe low-level nuclear waste disposal to be a national priority and that they pledge to develop a fail-safe system for disposal. He said that List will propose the formation of a single federal entity responsible for nuclear low-level waste, perhaps a regrouping of NRC, DOT, and other officials responsible for regulation of the waste into one agency or department.

Officials in the state of Washington said that Gov. Dixie Lee Ray will warn NRC at the meeting that her state is considering developing its own regulatory and enforcement authority over commercial nuclear waste if NRC and DOT do not take action to upgrade packaging and shipping to ensure safe disposal.

NRC officials said that they had taken action to upgrade regulation and enforcement of low-level waste and said that they would inform the governors of these actions at the Nov. 6 meeting. NRC, said one key official, has amended its regulations to allow NRC inspections of certain types of waste packaging, which in the past had been inspected only by DOT. Now, says the official, both NRC and DOT will inspect the packaging. NRC also has proposed a reallocation of 11 FY-80 man-years (pending approval of a request for a supplemental appropriation for that amount) for the upgrading of NRC inspection of waste packaging. NRC plans to use the money to send teams monthly to commercial sites to assist states in inspections. NRC also plans to use the money to conduct emergency inspections of any commercial waste generator at the request of a governor.

NOVEMBER NEWS
Dec. 13, 1979

THE SOUTH CAROLINA ATTORNEY GENERAL WAS BEGINNING AN INVESTIGATION this week of allegations made by a former Chem-Nuclear Systems employee that the Barnwell burial site had been careless in the handling of radioactive materials. The employee, Susan Lott, formerly chief accountant for the firm, made her allegations on a television news broadcast. Appearing with her were a former mayor of Blackville, S.C., a town 10 miles from the Barnwell site, and two local farmers who were protesting the unsafe conditions she outlined.

Among the allegations made by Lott was that employees at the burial site — which is the nation's largest low-level waste repository — gave keys to some truckers to enable them to open the gates at night and did not inspect all incoming trucks. One truck — belonging to a common carrier — was alleged to have brought in a leaking contaminated package. The leak was not discovered for several days. During this time the truck had been carrying common nonradioactive cargo, Lott asserted. Also, materials that had been declared unsafe and were to be buried at the site — such as watches — were taken by employees and are currently in local homes. One employee, Lott said, built an addition to his house using lumber from the Chem-Nuclear site. Lott was employed at the site from 1974-8.

The Barnwell site has just been examined by NRC for a one-foot fault (NW, 1 Nov, 9). The inspection revealed that there is indeed a fault in the soil zone, according to an NRC source. However, the fault would not have a significant effect on migration, he noted, as it is clay-filled. Therefore, it is much less permeable than the surrounding material. NRC did suggest to South Carolina and Chem-Nuclear that a geological consultant knowledgeable in the area also be engaged to do a report on the site. A South Carolina official confirmed that a geologist had visited the Barnwell site and that his findings had concurred with those of NRC.

STATE GOVERNMENT NEWS

Dec. 1979

Atomic Waste Dump to Reopen

Washington Governor Dixy Lee Ray in mid-November announced she would reopen the Hanford low-level atomic waste dump.

Governor Ray made the announcement after meeting with Nuclear Regulatory Commission (NRC) Chairman Joseph Hendrie on the need for improving federal enforcement of packaging and transportation standards for low-level radioactive wastes.

The action would ease problems hospitals, medical laboratories, and nuclear power stations were having in disposing of low-level radioactive wastes.

Their problems began when two of the nation's three atomic waste dumps—in Washington and Nevada—closed October 4 and 23, respectively.

Nevada Governor Robert List said the dump at Beatty will remain closed due to poor operating practices there. A hearing was set for revoking the dump's license.

South Carolina Governor Richard Riley announced the site at Barnwell would start phasing down the total amount of waste it will accept.

The governors of the three states have emphasized that their states should not have to be repositories for all the nation's radioactive wastes.

Dec. 13, 1979

PENNSYLVANIA WILL UNDERTAKE A SURVEY FOR POTENTIAL LOW-LEVEL WASTE SITES in the state.

A source in the state Department of Environmental Resources said a disposal site is necessary to replace "undependable" facilities in Nevada, Washington and South Carolina, states which have signaled their reluctance to accept waste from out of their borders.

The Pennsylvania survey, the source said, is only a preliminary step, with the bureau pressing for concerted action by northeastern states to start handling their own low-level waste. The source noted that it could be a matter of years for Pennsylvania to select a final site out of the candidate sites identified.

"Right now the northeastern states produce about 50% of all radioactive wastes in the country, including 50% of the institutional wastes and 50% of all the nation's reactor waste," the source said. If other northeastern states are reluctant to accept their responsibility, he said, Pennsylvania would probably act on its own and limit its disposal site to commonwealth waste only. "But the best solution would be one where the states joined in a cooperative venture," he said.

STATE HEADLINES (Council of State Governments)

Dec. 14, 1979

Low-level radioactive waste dumping grounds in WASHINGTON and NEVADA were reopened in the past two weeks after being closed by the governors who complained of improper packaging and shipping by some electric generating stations and commercial outlets. In SOUTH CAROLINA, the state has approved a new license for the Barnwell low-level waste site but placed graduated reduction limits on the site's intake reducing by 12,000 cubic feet the amounts of material permitted in the site every three months until a level of 100,000 cubic feet per month is attained.

APPENDIX D: List of Counties in the State Economic Areas of South Carolina

List of Counties in each State Economic Area
of the State of South Carolina

SEA 1 Oconee
Pickens

SEA 2 Anderson
Greenwood
Laurens
Spartanburg

SEA 3 Cherokee
Chester
Lancaster
Union
York

SEA 4 Abbeville
Edgefield
Fairfield
McCormick
Newberry
Saluda

SEA 5 Chesterfield
Kershaw

SEA 6 Allendale
Bamberg
Barnwell
Calhoun
Clarendon
Darlington
Darlington
Hampton
Lee
Marlboro
Orangeburg
Sumter

SEA 7 Dillon
Florence
Horry
Marion
Williamsburg

SEA 8 Beaufort
Berkeley
Colleton
Dorchester
Georgetown
Jasper

SEA A Lexington
Richland

SEA B Aiken

SEA C Charleston

SEA D Greenville

APPENDIX E: Waste Transportation and Disposal Act

(R499, H3350)

An Act To Amend Chapter 7 Of Title 13, Code Of Laws Of South Carolina, 1976, Relating To Nuclear Energy, As Follows: By Adding Article 2 So As To Provide For Control Of The Transportation Of Radioactive Waste Into And Within The State, To Provide For Bonding Of Persons Transporting Such Waste And For Other Protective Safeguards, To Provide For Regulatory And Emergency Authority Of The Department Of Health And Environmental Control, To Provide For Certain Inspections And Reports, To Provide For Methods Of Enforcement Including The Service Of Legal Process, To Provide For Assessment Of Fines, Penalties and Fees And For Their Credit To The General Fund; By Adding Section 13-7-85, Relating Primarily To Article 1, So As To Authorize The Department Of Health And Environmental Control To Hold Public Hearings, Subpoena Witnesses, Make Findings And Establish, Assess And Pay Over Civil Penalties; By Amending Section 13-7-70, Relating To Certain Rules And Regulations Of The Department Of Health And Environmental Control And To Certain Agreements With Federal Agencies, So As To Make The Section Applicable To The Transportation Of Radioactive Waste Regulated By Article 2.

Be it enacted by the General Assembly of the State of South Carolina :

South Carolina Radioactive Waste Transportation and Disposal Act

SECTION 1. Chapter 7, of Title 13 of the 1976 Code is amended by adding:

"Article 2

Control of Transportation and Disposal of Radioactive Waste

Section 13-7-110. This act shall be cited as the South Carolina Radioactive Waste Transportation and Disposal Act.

Section 13-7-120. Definitions as used in this article:

A. 'Carrier' means any person transporting radioactive wastes into or within the State for storage, disposal or delivery.

B. 'Department' means the Department of Health and Environmental Control, including personnel authorized to act on behalf of the Department.

C. 'Disposal facility' means any facility located within the State, which accepts radioactive waste for storage or disposal.

D. 'Emergency' means any condition existing outside the bounds of nuclear operating sites owned or licensed by a federal agency.

and any condition existing within or outside of the jurisdictional confines of a facility licensed by the Department arising out of the handling or the transportation of radioactive waste, as hereinabove defined, which is endangering or could reasonably be expected to endanger the health and safety of the public, or to contaminate the environment.

E. 'Generation' means the act or process of producing radioactive wastes.

F. 'Manifest' means the document used for identifying the quantity, composition, origin, and destination of radioactive waste during its transport to a disposal facility.

G. 'Operator' means every person who drives or is in actual physical control of a vehicle transporting radioactive waste.

H. 'Permit' means an authorization issued by the Department to any person involved in the generation of radioactive waste, to transport such radioactive wastes or offer such waste for transport.

I. 'Person' means any individual, public or private corporation, political subdivision, government agency, municipality, industry, partnership or any other entity whatsoever.

J. 'Radioactive waste' means any and all equipment or materials which are radioactive or have radioactive contamination and which are required pursuant to any governing laws, regulations or licenses to be disposed of as radioactive waste and which is further defined as follows:

(1) 'High-level waste' which is defined as either irradiated nuclear reactor fuel or the portion of the material generated in the reprocessing of such irradiated fuel that contains virtually all of the fission products and most of the actinides not separated out during reprocessing.

(2) 'Transuranic waste' which is defined as waste containing more than ten nanocuries of transuranic activity per gram of material.

(3) 'Low-level radioactive waste' which is defined as all radioactive waste which contains less than ten nanocuries of transuranic activity per gram or which is free of any transuranic contaminants.

K. 'Shipper' means any person, whether a resident of South Carolina or a non-resident (1) who transfers radioactive waste to a carrier for transportation into or within the State; (2) who transports his own radioactive waste into or within the State; or (3) who transfers radioactive waste to another person if such wastes are transported into or within the State.

L. 'Transport' means the movement of radioactive wastes into or within South Carolina.

Section 13-7-130. This article applies to any shipper, carrier or other person who transports radioactive waste into or within this State, to any person involved in the generation of radioactive waste within this State, and to any shipper whose radioactive waste is transported into or within the State or is delivered, stored or disposed of within this State.

Section 13-7-140. A. Before any radioactive wastes may be transported into or within the State, the shipper shall:

1. Deposit and maintain with the Department a cash or corporate surety bond satisfactory to the Department in form and amount or provide evidence of liability insurance sufficient, to protect the State and the public at large from possible radiological injury or damage to any person or property due to packaging, transportation, disposal, storage or delivery of radioactive wastes.

In establishing the amount of such bond or insurance, the Department shall consider all relevant factors including the nature and quantity of radioactive waste involved; *provided*, that any insurance carried pursuant to Section 2210 of Title 42 of the United States Code and Part 140 of Title 10 of the Code of Federal Regulations shall be sufficient to meet the requirements of this section.

2. Comply fully with all applicable laws and administrative rules and regulations, both state and federal, regarding the packaging, transportation, storage, disposal and delivery of such wastes.

3. Certify to the Department that it will hold the State of South Carolina harmless for all claims, actions or proceedings in law or equity arising out of radiological injury or damage to persons or property occurring during the transportation of its radioactive waste into or within the State including all costs of defending the same; *provided*, however, that nothing contained herein shall be construed as a waiver of the state's sovereign immunity.

4. Provide to the Department for each separate shipment of such wastes a shipping manifest which shall be signed by an authorized agent or officer of the responsible person as defined herein.

5. Provide to the Department for each separate shipment of such wastes a certification, in form satisfactory to the Department, which shall certify that the foregoing requirements have been complied with, and which may include other certifications which the Department may find necessary to accomplish and enforce its responsibilities.

6. Provide such other information as the Department may deem necessary for the protection of the health and safety of the public and the environment.

7. Purchase a permit authorizing the transport of radioactive wastes into or within the State.

B. The Department shall issue such permit to any shipper who shall certify that he will comply with provisions 1 through 6 of subsection A, and provided further that such permit shall not, in itself, be construed as authorizing a shipper to dispose of radioactive waste within the State. No additional permit shall be issued to any shipper whose permit is under suspension or revocation.

C. No permit shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any permit to any person, unless the Department shall, after securing full information, find the transfer is in accordance with the provisions of this act and shall give consent in writing.

Section 13-7-145. A. Any shipper who is not a resident of South Carolina and who is not registered with the Secretary of State for purposes of doing business within South Carolina, shall be subject to service of process for purposes of administering and enforcing this act by leaving copy of the Summons or any other legal paper in the hands of the Secretary of State or in his office, and such service shall be deemed sufficient service and shall have like force and effect in all respects as service upon citizens of this State found within its limits if notice of such service and a copy of the paper served are forthwith sent by certified mail to the shipper and the shipper's return receipt and an affidavit of compliance therewith are filed in the cause and submitted to the administrative agency or court from which such process or other paper issued.

Such service may also be made by delivery of a copy thereof to any such shipper outside the State, and proof of such delivery may be made by the affidavit of the person delivering such copy. Such affidavit shall be filed in the cause and submitted to the administrative agency or court from which the process or other paper issued.

B. Any carrier who is not a resident of South Carolina and who is not registered with the Secretary of State for purposes of doing business within South Carolina, shall be subject to service of process for purposes of administering and enforcing this act by leaving copy of the Summons or any other legal paper in the hands of the Secretary of State or in his office, and such service shall be deemed

sufficient service and shall have like force and effect in all respects as service upon citizens of this State found within its limits if notice of such service and a copy of the paper served are forthwith sent by certified mail to the carrier and the carrier's return receipt and an affidavit of compliance therewith are filed in the cause and submitted to the administrative agency or court from which such process or other paper issued.

Such service may also be made by delivery of a copy thereof to any such carrier outside the State, and proof of such delivery may be made by the affidavit of the person delivering such copy. Such affidavit shall be filed in the cause and submitted to the administrative agency or court from which the process or other paper issued.

Section 13-7-150. A. After acceptance of and departure with a shipment of radioactive waste, a carrier shall immediately notify the Department of any variance, occurring after departure, from the shipper's notification of primary route and estimated date of arrival as provided in Section 13-7-160 (A) and (B).

B. The carrier shall provide to the Department a certification in form satisfactory to the Department, which shall accompany each shipment of waste materials shipped into or within the state, stating:

(1) That the shipment is properly placarded for transport and that all shipping papers required by law and administrative rules and regulations have been properly executed.

(2) That the transport vehicle has been inspected and meets the applicable requirements of the federal government and the State of South Carolina, and that all safety and operational components are in good and operative condition.

(3) That said carrier has received a copy of the shipper certification of compliance and the shipping manifest as set forth in Section 13-7-140.

(4) That said carrier shall comply fully with all applicable laws and administrative rules and regulations, both state and federal, regarding the transportation of such wastes.

C. Any shipment of such wastes to a disposal facility located within this State must be accompanied by the certification required in paragraph B above.

D. Each carrier shall provide, as deemed necessary by the Department, evidence of successful completion by its operators of operator training requirements as may be prescribed by the United States Department of Transportation for all operators transporting radioactive waste into or within this State.

Section 13-7-160. A. The Department shall issue interim regulations as needed for the implementation of this article immediately upon the effective date of this act, the provisions of Act 176 of 1977 notwithstanding; *provided*, that the regulations at a minimum shall require that the shipper state the estimated date of arrival at the disposal facility, identify the primary route within the State, give at least seventy-two hours written notice to the Department prior to any transportation of radioactive waste into or within this State, and establish a schedule of fees for permits, which fees shall be assessed annually.

B. Final regulations shall be promulgated by the Department within one hundred twenty days from the effective date of the article and shall be subject to the procedures set forth in Act 176 of 1977; provided that the regulations at a minimum shall include, but not be limited to, provisions for the use of signs designating radioactive material cargo; for the packing, marking, loading and handling of radioactive materials and the precautions necessary to determine whether the material which is offered for transport is in proper condition, requiring the shippers to state the estimated date of arrival at the disposal facility, to identify the primary route within the State to give at least seventy-two hours written notice to the Department prior to any transportation of radioactive waste into or within this State, and establishing a schedule of fees for permits, which fees shall be assessed annually.

In preparing its regulations, the Department of Health and Environmental Control is authorized to distinguish as to the radioactive isotope and its curie strength so as to protect the general public.

C. Rules and regulations adopted by the Department pursuant to this section may be enforced, within their respective jurisdiction, by any authorized representative of the Department, the State Department of Highways and Public Transportation and the Public Service Commission, according to mutual understandings between such bodies of their respective responsibilities and authority.

D. The Department, in its discretion, may for any shipment allow a notification period shorter than the 72 hours required in paragraphs A and B of this section, if the Department determines that such notification is satisfactory to carry out the purposes of this article. In exercising its discretion, the Department shall consider all relevant factors including the nature and quantity of the radioactive waste involved.

E. The Department may exempt certain shipments of seventy-five cubic feet or less of radioactive waste from the advance notice provisions of this section dependent on the radioactive isotopes and curie strength in the shipment. If such is done the shipper must provide, nevertheless, the required certification pursuant to section 13-7-140 (A) (5).

Section 13-7-170. A. Owners and operators of disposal facilities shall permanently record, and report to the Department within twenty-four hours after discovery, any and all conditions in violation of the requirements of this act discovered as a result of inspections required by any license under which the facility is operated.

B. No owner or operator of a disposal facility located within this State shall accept radioactive waste for disposal unless the shipper of such waste has a valid permit issued pursuant to Section 13-7-140 (A) of this article.

Section 13-7-180. A. Notwithstanding any other provision of law, any person violating the provisions of this article, except as provided below for radiological violations, shall be assessed a civil penalty of up to one thousand dollars for each such violation; *provided*, that should the Department determine that a series of such violations has occurred the Department shall suspend or revoke such person's permit for any time period determined to be proper, such period to be in the discretion of the Department but in any event, not to exceed twelve months.

In the case of a radiological violation, defined as any radiation level in excess of limits set forth in all applicable laws, rules and regulations, any shipper or carrier shall be assessed a civil penalty of not less than one thousand nor more than five thousand dollars, in the discretion of the Department, and such person, if a shipper, shall lose his permit for not less than thirty days, and until such further time as the shipper demonstrates to the Department's satisfaction that adequate measures have been taken to insure that such violations will not reoccur.

If a second radiological violation occurs within a period of twelve months the shipper or carrier shall be assessed a civil penalty of not less than five thousand nor more than twenty-five thousand dollars, in the discretion of the Department, and such person if a shipper shall have its permit revoked for a period in the discretion of the Department of up to one year and until such further time as the shipper has shown to the Department's satisfaction that adequate

measures have been taken to insure that such violations will not reoccur.

B. Any person to whom an order issued under this article is directed, shall comply therewith immediately, but on application to the Department, within twenty days after the date of the order, shall be afforded a hearing within thirty days of such application. Any hearings held pursuant to this section shall be held pursuant to the procedures set forth in Act 176 of 1977, except that where the provisions of this article are in conflict with the provisions of Act 176 of 1977, this article shall control.

C. Any fines or penalties set forth in this article are in addition to any others provided by statutes, rules or regulations.

D. In assessing a fine, penalty, or suspending or revoking a permit, the Department shall consider but not be limited to, the following factors:

1. The degree of harm to the public health or safety which has resulted or might result from such violations;
2. The degree of exceedence of a radiation level as set forth in applicable law and regulation;
3. The duration of the violation; and
4. The prior record of the violator with regard to law and regulation governing the transportation of radioactive waste.

Section 13-7-190. A. The monies obtained from the levying of fines, penalties or fees under this article shall accrue to the general fund of the State.

B. The funds received from the purchase of permits shall be sufficient to administer and enforce the permitting provisions of this article.

Section 13-7-200. Whenever the Department finds that an emergency, as hereinabove defined, exists requiring immediate action to protect the public health, and safety the Department may, without notice or hearing, issue an order reciting the existence of such emergency and requiring that such action be taken as is necessary to meet the emergency. Notwithstanding any other provision of law, such order shall be effective immediately.

Any person to whom such order is directed shall comply therewith immediately, but on application to the Department shall be afforded a hearing within thirty days. On the basis of such hearing, the emergency order shall be continued, modified or revoked within thirty days after such hearing."

Department authorized to hold public hearings, etc.

SECTION 2. The 1976 Code is amended in Title 13, Chapter 7, Article 1 by adding:

"Section 13-7-85. A. The Department is authorized to hold public hearings, compel attendance of witnesses, make findings of fact and determinations and to assess civil penalties. The Department by rule or regulation shall fix a schedule of reasonable fines and civil penalties relating to violations of the provisions of this article or any rule or regulation, license or license condition, permit or permit condition, temporary or permanent order, or final determination of the department and any person violating any of the provisions of this article, or any rule or regulation, license or license condition, permit or permit condition, temporary or permanent order, or final determination of the department shall be subject to said schedule of fines and civil penalties; *provided*, that the maximum penalty for any violation shall not exceed twenty-five thousand dollars.

Provided, that the provisions of Act 176 of 1977 notwithstanding, the Department shall issue an interim schedule of reasonable fines and civil penalties which shall remain in force and effect until such time as the Department issues final rules and regulations pursuant to the provisions of Act 176 of 1977.

Each day of noncompliance with any rule or regulation, license or license condition, permit or permit condition, temporary or permanent order, as final determination of the Department shall constitute a separate violation.

B. In assessing a fine or penalty, or suspending or revoking a permit, the Department shall consider, but not be limited to, the following factors:

1. The degree of harm to the public health or safety which has resulted or might result from such violations;
2. The degree of exceedence of a radiation level as set forth in applicable law and regulation;
3. The duration of the violation; and
4. Any prior violations of statutes, rules, orders, regulations, license or license condition, permit or permit condition.

C. Any person to whom an order issued under this article is directed, shall comply therewith immediately, but on application to the Department, within twenty days after the date of the order, shall be afforded a hearing within thirty days of such application. Any hearings held pursuant to this section shall be held pursuant to the pro-

cedures set forth in Act 176 of 1977, except that where the provisions of this article are in conflict with the provisions of Act 176 of 1977, this article shall control.

D. The monies obtained from the levying of fines, penalties or fees under this article shall accrue to the general fund of the State."

Applicability

SECTION 3. The 1976 Code is amended by adding at the end of subsection (1) of Section 13-7-70 the following:

"Nothing in this section shall be deemed applicable to the transportation of radioactive waste which is regulated by Article 2 of this chapter."

Severability clause

SECTION 4. The General Assembly hereby declares that each of the sections and provisions of this act are severable, and in the event that any one or more of such sections are declared unconstitutional or invalid, the remaining sections and provisions of this act shall remain in effect.

Time effective

SECTION 5. This act shall take effect upon approval by the Governor.

In the Senate House the 21st day of May

In the Year of Our Lord One Thousand Nine Hundred and Eighty.

NANCY STEVENSON,
President of the Senate.

REX L. CARTER,
Speaker of the House of Representatives.

Approved the 26th day of May, 1980.

RICHARD W. RILEY,
Governor.

APPENDIX F: Regulations for Radioactive Materials

RHA 3.11 SECURITY AND FIRE PROTECTION OF STORED RADIOACTIVE MATERIAL.

- 3.11.1 Radioactive material shall be secured against unauthorized removal from places of storage and shall be provided with reasonable protection against loss, leakage, or dispersion by the effects of fire or by water, hose streams or by other means used to fight fire.
- 3.11.2 Sources of Radiation in an unrestricted area and not in storage shall be tended under the constant surveillance and immediate control of the licensee.

RHA 3.12 WASTE DISPOSAL. GENERAL REQUIREMENT.

- 3.12.1 Except as provided in 3.12.2, no licensee shall dispose of any radioactive material except:
 - 3.12.1.1 By transfer to an authorized recipient as provided in RHA 2.17.
 - 3.12.1.2 As authorized pursuant to RHA 3.5, RHA 3.13.

3.12.2 Any person may apply to the Department for approval of proposed procedures to dispose of radioactive material in a manner not otherwise authorized in this Part. Each application shall include a description of the radioactive material, including the quantities and kinds of radioactive material and the levels of radioactivity involved, and the proposed manner and conditions of disposal. The application, where appropriate, should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures. The Department will not approve any application for a license to receive radioactive material from other persons for disposal on land not owned by a state or the federal government.

RHA 3.13 DISPOSAL BY RELEASE INTO SANITARY SEWER SYSTEMS. No licensee shall discharge radioactive material into a sanitary sewer system unless:

3.13.1 It is readily soluble or dispersible in water; and

3.13.2 The quantity of any radioactive material released into the system by the licensee in any one day does not exceed the larger of:

3.13.2.1 The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the licensee, will result in an average concentration not greater than the limits specified in RHA 3.21, Appendix A, Table I, Column 2; or

3.13.2.2 Ten times the quantity of such material specified in RHA 3.22, Appendix B; and

3.13.3 The quantity of any radioactive material released in any month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in RHA 3.21, Appendix A, Table I, Column 2; and

- 3.13.4 The gross quantity of radioactive material released into the sewer system by the licensee does not exceed one curie per year.
- 3.13.5 This regulation does not authorize disposal by septic tank and/or cesspool type sewage systems.
- 3.13.6 Excreta, blood and blood plasma from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this regulation (RHA 3.13), provided that, the licensee provides for appropriate radiological monitoring whenever any waste line in the licensee's installation which may carry such excreta, blood or blood plasma is opened.

RHA 3.14 PROCEDURES FOR OPENING PACKAGES.

- 3.14.1 Each licensee shall establish and maintain procedures for safely opening packages in which licensed material is received, and shall assure that such procedures are followed and due consideration is given to special instructions for the type of package being opened. Such procedures shall include sufficient surveys and tests of the external surfaces of the package to insure that leakage has not occurred.
- 3.14.2 Results of package surveys and tests shall be recorded and maintained for inspection by the Department.

RHA 3.15 TREATMENT OR DISPOSAL BY INCINERATION. No licensee shall dispose of radioactive material by incineration or prepare it by incineration for disposal except as specifically approved by the Department.

RHA 3.16 RECORDS.

- 3.16.1 Each licensee shall maintain accurate and complete written records showing:
 - 3.16.1.1 The results of each required survey and leak test.
 - 3.16.1.2 Each receipt, transfer, and disposal of radioactive material.
 - 3.16.1.3 Radiation exposures of all individuals for whom personnel monitoring is required under RHA 3.6. Exposure records shall be kept on Department Form SC-RHA-40 or a clear and legible record containing all the information required on said form and shall be for periods of time not exceeding one calendar quarter.

**APPENDIX G: Interim Regulations for the Transportation of Radioactive Waste
Into or Within South Carolina**

South Carolina Department of Health
And Environmental Control

INTERIM REGULATIONS FOR THE TRANSPORTATION
OF RADIOACTIVE WASTE INTO OR
WITHIN SOUTH CAROLINA

Approved by the South Carolina
Board of Health and Environmental Control

May 26, 1980

Promulgated pursuant to Act No. 499 of 1980, The South Carolina
Radioactive Waste Transportation and Disposal Act, Amending Art.
13-7-10 et seq. of the 1976 Code of Laws.

1. SCOPE

- 1.1 These regulations shall apply to all persons who ship or transport radioactive waste as herein defined into or within the State of South Carolina, the provisions of S. C. Regulation 61-63 of the 1976 Code of Laws, paragraph RHA 2.22 notwithstanding.
- 1.2 These regulations shall be effective until the effective date of such final regulations as may be promulgated by the Department.
- 1.3 All persons subject to the provisions of this regulation shall comply with applicable provisions of 49 CFR Parts 171 - 179, 49 CFR Parts 386 - 399, 10 CFR Part 71, and S. C. Regulation 61-63 of the 1976 Code of Laws insofar as they relate to the packaging of radioactive material, marking and labeling of packages, loading and storage of packages, placarding of the transportation vehicles, and monitoring and reporting requirements.

2. DEFINITIONS

- 2.1 "Department" means the Department of Health and Environmental Control, including personnel authorized to act on behalf of the Department.
- 2.2 "Disposal facility" means any facility located within the State which accepts radioactive waste for storage or disposal.
- 2.3 "Generation" means the act or process of producing radioactive wastes.
- 2.4 "Radioactive waste" means any and all equipment or materials which are radioactive or have radioactive contamination and which are required pursuant to any governing laws, regulations,

or licenses to be disposed of as radioactive waste and which is further defined as follows:

- 2.4.1 "High-level waste" is defined as either irradiated nuclear reactor fuel or the portion of the material generated in the reprocessing of such irradiated fuel that contains virtually all of the fission products and most of the actinides not separated out during reprocessing.
- 2.4.2 "Transuranic waste" which is defined as waste containing more than ten nanocuries of transuranic activity per gram of material.
- 2.4.3 "Low-level radioactive waste" which is defined as all radioactive waste which contains less than ten nanocuries of transuranic activity per gram or which is free of any transuranic contaminants.
- 2.5 "Person" means any individual, public or private corporation, political subdivision, government agency, municipality, industry, partnership or any other legal entity whatsoever.
- 2.6 "Transport" means the movement of radioactive wastes into or within South Carolina.
- 2.7 "Operator" means every person who drives or is in actual physical control of a vehicle transporting radioactive waste.

- 2.8 "Manifest" means the document used for identifying waste during its transport to a disposal facility.
- 2.9 "Permit" means an authorization issued by the Department to any person involved in the generation of radioactive wastes, to transport such radioactive wastes or offer such waste for transport.
- 2.10 "Carrier" means any person transporting radioactive wastes into or within the State for storage, disposal, or delivery.
- 2.11 "Shipper" means any person, whether a resident of South Carolina or a non-resident:
 - 2.11.1 who transfers radioactive waste to a carrier for transportation into or within the State; or
 - 2.11.2 who transports his own radioactive waste into or within the State;
 - or
 - 2.11.3 who transfers radioactive waste to another person if such wastes are transported into or within the State.
- 2.12 "Radiological violation" means radioactive contamination or the emission of radiation in excess of applicable limits.

3. BONDS AND PERMITS

- 3.1 Any shipper who transports radioactive waste into or within the state after July 1, 1980, must first:
 - 3.1.1 Provide to the Department satisfactory evidence of financial ability to protect the state and the public at large from possible radiological injury or damage due to packaging, transportation, disposal, storage,

or delivery of radioactive waste.

- 3.1.2 Purchase a permit from the Department. Application for a permit must be submitted in writing together with the necessary fee to:

Bureau of Radiological Health
S. C. Department of Health and Environmental
Control
2600 Bull Street
Columbia, South Carolina 29201

The application must include:

- 3.1.2.1 the company name, address, and location(s) from which the waste will be shipped;
- 3.1.2.2 the name, title, address and phone of that individual in corporate management who is responsible for radioactive waste shipments and disposal;
- 3.1.2.3 a statement that the company has current copies of the disposal site radioactive materials license, the disposal site waste acceptance criteria, and 49 CFR Parts 171 - 179.
- 3.1.2.4 a certificate that the shipper will hold the State of South Carolina harmless for all claims, actions, or proceedings in law or equity arising out of radiological injury or damage to persons or property occurring during the transportation of its radioactive waste into or within the state including all costs of defending the same; provided, however, that nothing contained herein shall be construed as a waiver of the state's sovereign immunity.

3.1.3 The permit fee for any shipper who will ship a total of 75 cubic feet or less of radioactive waste consisting of 100 curies or less total activity for disposal within the State between the date of issuance of the permit and December 31, 1980, is \$50. The fee for any shipper who will ship more than 75 cubic feet or more than 100 curies between the date of issuance and December 31, 1980, is \$500. The fee for any shipper who does not consign radioactive waste for storage or disposal within the state between the date of issuance and December 31, 1980, is \$50.

3.2 The fee for the permit so purchased will not be refunded. Any surety bond will be returned to any shipper who notifies the Department in writing of his intention to cease shipments of radioactive waste into or within the State after the last such shipment is accepted safely at its destination.

4. ROUTES, PRIOR NOTIFICATION, AND CERTIFICATION

4.1 Before a shipment of radioactive waste may be transported into or within the State, the shipper shall comply with the following provisions:

4.1.1 Give written notice to the Department at least 72 hours before the expected date of the shipment except as provided in paragraph 4.1.2. In the case of shipments consigned for disposal, this requirement may be satisfied by such other report required by rule, regulation, or policy, which contains the same information and which is received by the

Department at least 72 hours before the estimated time of shipment. Such notice shall consist of at least the following information:

4.1.1.1 the estimated date of arrival if the destination is within the State, or the estimated date of shipment if the destination is outside the State;

4.1.1.2 the route to be followed within the State;

4.1.2 For shipments consisting of 75 cubic feet or less and containing 1 curie of radioactive material or less and which may be consigned as non-exclusive use shipments according to applicable U. S. Department of Transportation regulations, the requirement for prior notification contained in paragraph 4.1.1 is waived. Nevertheless, such shipments must comply with all other laws, regulations, and rules.

4.2 The carrier and all drivers shall be provided with a copy of the prior notification required by paragraph 4.1 and instructed to comply with the routes and schedule contained therein.

4.3 Each manifest used to describe a radioactive waste shipment shall include a certification properly executed by a representative of the shipper which shall include at a minimum the statement that the shipment has been inspected within 48 hours of the time of departure and that no items of non-compliance with applicable laws, rules, or regulations were found.

4.4 Each shipper shall provide to the Department for each shipment, a copy of the Radioactive Waste Prior Notification and Manifest Form with the consignee acknowledgment properly executed.

5. CARRIER'S CERTIFICATION

5.1 Each carrier who transports radioactive waste into or within the State after July 1, 1980, shall provide the following certificate:

Certification is hereby made to the S. C. Department of Health and Environmental Control that:

- 1) the shipper has provided the carrier with a copy of the shipment manifest, the certificate of compliance, and the routing instructions;
- 2) the shipment of radioactive waste has been properly placarded for transport according to applicable U. S. Department of Transportation regulations;
- 3) all shipping papers originated or reproduced by the carrier have been properly executed;
- 4) the transport vehicle has been inspected according to applicable DOT regulations and within the prescribed intervals and that all safety and operational components are in good working order;

- 5) all drivers who will operate the vehicle within the State are qualified to transport hazardous materials as specified by applicable U. S. Department of Transportation regulations.

_____ Signature	_____ Typed or printed name and title
_____ Company name and Phone	_____ Date

- 5.2 This certificate shall be typed or mechanically reproduced.
Legible mechanical reproduction of this page is acceptable.

- 5.3 The certificate shall:

5.3.1 be signed by a principal, officer, partner, or employee of the carrier or his agent; and

5.3.2 be legibly signed manually, by typewriter, or by other mechanical means.

6. PENALTIES

- 6.1 Whenever the Department finds that violations of the provisions of this regulation have occurred, it may impose penalties as follows:

6.1.1 Any person who commits a radiological violation shall:

6.1.1.1 be fined not less than one thousand nor more than five thousand dollars; and

6.1.1.2 if such person is a shipper, have his permit suspended for a period of not less than thirty days and until such time as he demonstrates to the Department's satisfaction that adequate