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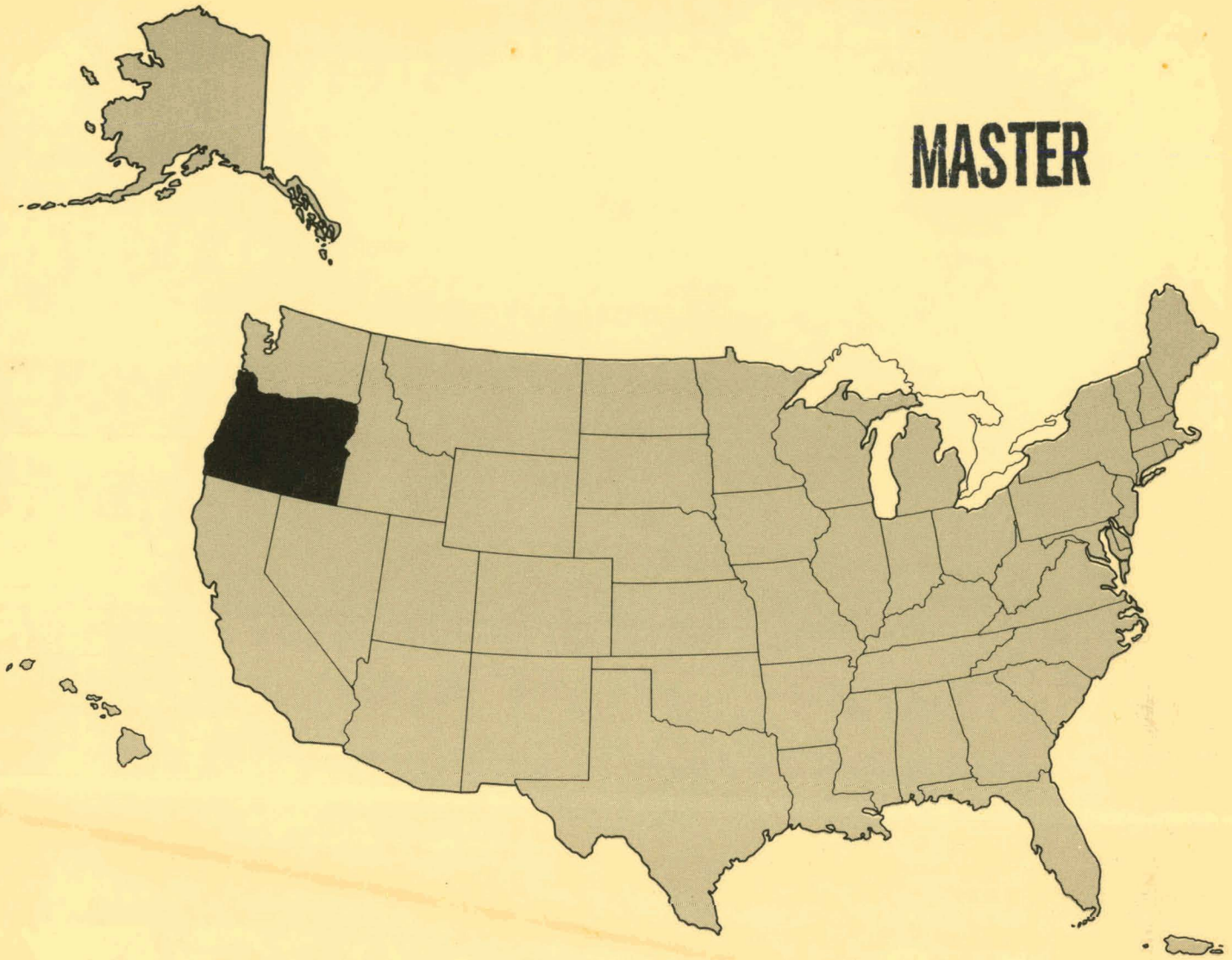

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Oregon State Briefing Book for Low-Level Radioactive Waste Management

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OREGON STATE BRIEFING BOOK FOR LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

Prepared for

EG&G Idaho, Inc.
under
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Prepared by

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MN ONLY

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1. INTRODUCTION

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

Of six commercial low-level radioactive waste disposal sites that have operated within the United States (see Table 1-1), only three are currently accepting additional wastes. Of these three, two sites have been closed intermittently because of various irregularities in disposal and shipping operations.[1] Table 1-2 presents the total waste volumes that have been disposed of at commercial sites during the period 1962 through 1979. In 1979, approximately 79 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 occur, the current disposal sites could be filled by the mid-1990s. However, recent proposed limitations of yearly burial quantities to be accepted by disposal sites located in South Carolina and Washington State will reduce the 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 a Washington State initiative will restrict use of the Richland commercial disposal site after July 1, 1981. Therefore, it is possible that by the mid-1980s there would be more waste volume generated per year than could be buried.[1]

Section 2 of this Briefing Book presents an overview of past and present low-level radioactive waste management practices within the State of Oregon. 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

TABLE 1-1

COMMERCIAL LOW-LEVEL RADIOACTIVE
WASTE DISPOSAL SITES(1)

Location	Year first licensed	Site operator	Licensing authority	Year closed
Maxey Flats, Ky.	1962	Nuclear Engineering Company	State	1977
Beatty, Nev.	1962	Nuclear Engineering Company	State	Open
Sheffield, Ill.	1967	Nuclear Engineering Company	NRC	1978
Richland, Wash.	1965	Nuclear Engineering Company	State and NRC	Open
Barnwell, S.C.	1971	Chem-Nuclear Systems, Inc.	State and NRC	Open
West Valley, N.Y.	1963	Nuclear Fuel Services	State and NRC	1975

TABLE 1-2

TOTAL U.S. WASTE VOLUMES BURIED AT COMMERCIAL BURIAL SITES (CUBIC METERS) (1)

Year	Burial Site						National annual total
	Kentucky	Nevada	South Carolina	Illinois	New York	Washington	
1962	-	1,861	-	-	-	-	1,861
1963	2,206	3,512	-	-	522	-	6,240
1964	3,872	2,836	-	-	6,388	-	13,096
1965	5,751	1,988	-	-	4,717	668	13,124
1966	5,556	3,533	-	-	4,697	2,402	16,188
1967	7,820	3,206	-	2,527	4,946	870	19,369
1968	8,177	3,576	-	2,713	4,505	669	19,640
1969	10,353	4,282	-	2,012	4,274	438	21,359
1970	12,520	4,131	-	2,825	5,096	423	24,995
1971	13,171	3,584	1,171	4,430	6,362	584	29,302
1972	15,577	4,301	3,757	5,956	7,054	654	37,299
1973	10.072	4,076	15,839	8,524	7,497	1,033	47,041
1974	8,897	4,103	18,244	12,373	8,574	1,411	53,602
1975	17,109	4,943	18,072	14,116	1,889*	1,500	57,629
1976	13,783	3,864	40,227	13,480	*	2,867	74,221
1977	423**	4,742	46,563	17,643	*	2,718	72,089
1978	**	8,827	61,566	102***	*	7,422	77,917
1979 (2)	**	6,491	63,433	***	*	9,980	79,914
Total	135,287	73,856	268,882	86,701	66,521	33,639	664,886

*Receipt and burial of wastes were suspended by Nuclear Fuel Services on 3/11/75.
**Receipt and burial of wastes were suspended on 12/27/77.
***Receipt and burial of wastes were suspended on 4/8/78.

of Oregon. Section 4 presents an overview of Oregon's state government and identifies the government institutions and agencies with statutory or other responsibilities affecting the generation, handling, and disposal of radioactive wastes within the state. The identities and attitudes of state officials and other organizations impinging on this issue are presented in the text and, where possible, in available representative print media. 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 for that information dealing with wastes shipped to commercial disposal facilities.

REFERENCE

1. William F. Holcomb, Inventory (1962-1978) and Projections (to 2000) of Shallow Land Burial of Radioactive Wastes at Commercial Sites: An Update, Nuclear Safety, Vol. 21, No. 3, May-June 1980.

2. NUS Corporation, The 1979 State-by-State Assessment of Low-Level Radioactive Wastes Shipped to Commercial Burial Grounds, NUS 3440, Revision 1, November 1980.

2. OVERVIEW OF LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

Historically, the generation of low-level radioactive waste and the requisite disposal practices of licensees have received little focus from regulatory agencies, interest groups, and the facilities themselves. These wastes, including their creation and environmental impact, were judged to be less than paramount in light of the waste volumes and activities produced by irradiated reactor fuel and other high-level sources. Although commercial nuclear power reactors contribute a significant portion of low-level radioactive waste, other major categories of waste generators include medical, educational, and industrial facilities.

The State of Oregon is an Agreement State whereby all radioactive material licenses and waste disposal practices are under the conditions and regulations established by the state government. The specific controls and operational criteria follow, at minimum, those instituted by the federal government.

The only operating commercial nuclear reactor within the State of Oregon is the Trojan unit, located 30 miles northwest of Portland. Two additional reactors, Pebble Springs 1 and 2, are scheduled to become operational in 1988 and 1990, respectively. No federal nuclear facilities exist within the State of Oregon.

Prior to the late 1960s and early 1970s, low-level radioactive waste disposal practices typically consisted of onsite storage. In accordance with existing federal regulations, wastes were generally stored in above-ground buildings or buried in shallow trenches. Present trends in waste disposal include onsite storage and eventual release to sewer systems and combination with common refuse after appropriate decay to exempt concentrations. Exempt concentrations, at minimum, follow parameters outlined in the Code of Federal Regulations, Section 10, Part 20.

The use of radioisotopes in medical diagnostic and therapeutic applications has increased as a result of relatively recent new applications and techniques in the medical field. Due to the short half-life of nuclides normally used for these purposes, the decay and release disposal method is frequently practiced. Other major facilities often select this mode of low-level radioactive waste disposal, if

this option is feasible. As the availability of commercial repositories become limited and economically prohibitive parameters impact the shipment of low-level radioactive waste, onsite decay is practiced with increased incidence.

The economics of waste shipment to distant repositories is dictating an efficient management program with regard to volumes generated by each facility. Trends by generator facilities appear to be channeled towards volume reduction. Evaluations are ongoing by numerous facilities to effectively reduce the volume and subsequently the number of requisite annual shipments of waste. These methods include the application of compaction, liquid evaporation, and waste solidification and incineration.

A total of 185 radioactive material licenses are in effect in Oregon. Information on disposal practices was solicited from each license holder by a written questionnaire (see Section 5.0). Appendix A presents the name and address of each license holder, the degree of response to the questionnaire, the type of facility, and whether they ship waste to a commercial disposal site. The degree of response was classified as follows:

N indicates that no response to the written questionnaire was received.

1 indicates the licensee did respond and provided all appropriate information.

2 indicates the licensee did respond but provided only information on type of facility, disposal method, and quantity of waste.

3 indicates the licensee did respond but provided only information on type of facility and disposal method.

The type of facility was classified as either Medical, Educational, Industrial, Power Reactor, or Governmental according to Part 1 of the survey form shown in Figure 5-4. It should be noted that the Medical classification includes both medical education facilties and governmental medical facilities, that the Educational classification excludes medical education facilities, and that the Governmental classification excludes both medical and educational facilities. A service

unit, such as a laboratory, was classified according to the type of facility to which it provides the service.

Of the 185 radioactive material users, contact was made with 91, of which 17 indicated they ship waste to commercial disposal facilities. Table 2-1 presents a breakdown of license holders by type of facility, response to questionnaire (telephone or written), and number of facilities using commercial disposal facilities. The "percent of all respondents" was calculated as the number of respondents shipping waste divided by the total number of respondents times 100. The "percent of facility respondents" was calculated as the number of respondents shipping waste divided by the total number of respondents in a facility classification times 100.

Table 2-2 presents the waste disposal practices employed, including disposal method other than shipment to commercial disposal facilities. In this table, the total of "number using" exceeds the total number of respondents due to use of several disposal practices by some facilities. It is believed that many facilities reported only the major disposal method used rather than all methods used and the data should be viewed with this qualification in mind. The "percent of all respondents" value was calculated as the number of respondents in a "type of facility" classification reporting use of a method divided by the total number of respondents times 100.

Table 2-3 presents the source of the radioactivity which eventually requires use of some disposal method.

TABLE 2-1

USE OF COMMERCIAL LOW-LEVEL WASTE FACILITIES

Type of facility	Number of licensees	Number of respondents	Percent response	Respondents using a commercial facility		
				Number	Percent of all respondents	Percent of facility respondents
Medical	53	21	39.6	8	8.8	38.1
Educational	16	12	75.0	5	5.5	41.7
Industrial	86	42	48.8	1	1.1	2.4
Power Reactor	1	1	100.0	1	1.1	100.0
Governmental	28	15	53.6	2	2.2	13.3
Unknown	1	-	-	-	-	-
TOTAL	185	91	49.2	17	18.7	-

TABLE 2-2

DISPOSAL PRACTICES USED FOR LOW-LEVEL RADIOACTIVE WASTES

Type of Facility	Number of respondents	Ship to Commercial Repository		Release to Sewer		Combine with Refuse		Vent to Atomsphere		Return to Vendor		Distribute in Product Form		No Waste Generated	
		Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents	Number* using	Percent of all respon-dents
Medical	21	8	8.8	3	3.3	8	8.8	1	1.1	4	4.4	0	0.0	4	4.4
Educational	12	5	5.5	3	3.3	2	2.2	1	1.1	3	3.3	0	0.0	2	2.2
Industrial	42	1	1.1	1	1.1	0	0.0	0	0.0	23	25.3	3	3.3	15	16.5
Power Reactor	1	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Governmental	15	2	2.2	1	1.1	1	1.1	0	0.0	8	8.8	0	0.0	4	4.4
TOTAL	91	17	18.7	8	8.8	11	12.1	2	2.2	38	41.8	3	3.3	25	27.5

*The total of "number using" exceeds the total number of respondents due to use of several practices at each facility

TABLE 2-3

SOURCES OF RADIOACTIVITY REQUIRING DISPOSAL

Type of facility	Number of respondents	Nuclear reactor		Sealed sources		Unsealed radioactive material		Neutron generator	
		Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents	Number of sources*	Percent of all respondents
Medical	17	0	0.0	0	0.0	17	25.8	0	0.0
Educational	10	0	0.0	3	4.5	7	10.6	1	1.5
Industrial	27	0	0.0	22	33.3	5	7.6	0	0.0
Power Reactor	1	1	1.5	0	0.0	0	0.0	0	0.0
Governmental	11	0	0.0	8	12.1	3	4.5	0	0.0
TOTAL	66	1	1.5	33	50.0	32	48.5	1	1.5

*The total of "number of sources" exceeds the total number of respondents due to facilities generating waste from several sources

3. DEMOGRAPHY

This section 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 of Oregon, to assist with an assessment of the state as a potential producer of radioactive wastes. It also identifies those institutions, including hospitals, colleges, and universities that are major users of radionuclides that may ultimately be radioactive wastes.

3.1 LOCATION

Oregon is located in the nation's Pacific Northwest region. It is bounded on the north by Washington, on the east by Idaho, on the south by Nevada and California, and on the west by the Pacific Ocean. The state is physically separated from much of Washington by the Columbia River.

3.2 POPULATION

Population trends offer a broad-gauge measure of isotope utilization in medicine, educational and research activities, and industry. A trend revealing an increase in a state's population may imply increasing isotope use and in turn, waste generation.

Oregon ranks as the twenty-ninth most populous state in the nation and had a population density of approximately 24 persons per square mile in 1975.[1,2] The state's population increased 14.0 percent between 1970 and 1977 from 2,091,533 persons to 2,385,000 persons. In 1978, Oregon's population totaled 2,444,000 persons, representing an annual increase of 2.5 percent. During both time periods, natural increases and migration were responsible for the population growth. Between 1970 and 1977, there were 232,591 births as compared to 141,603 deaths. This gain in population was accompanied by a net migration of 9.5 percent during this 7-year period, an inmigration of approximately 198,000 persons. In 1977, the birth rate was 15.8 births per 1,000 (approximately 37,683 births) and the death rate was 8.6 deaths per 1,000 (approximately 20,511 deaths). In 1978, the state's birth and death rates were 15.9 per 1,000 and 8.6 per 1,000, respectively.[3,4,5,6]

(The 1978 figure represents a provisional sample of all deaths in Oregon. A final figure is currently unavailable.)

Oregon's major population centers are the Standard Metropolitan Statistical Areas (SMSA) of Eugene, Portland, and Salem, which comprised 59.4 percent of the state's population in 1978. Of the three SMSAs, Portland is the largest with a 1978 population of 968,600 persons. Between 1970 and 1977, Eugene, Portland, and Salem populations increased by 17.2, 8.5, and 17.4 percent, respectively.[3,4] Figures 3-1 and 3-2 depict the location of Oregon's counties and SMSAs; Table 3-1 lists the 1970, 1977, and 1978 population of the SMSAs; and Figure 3-3 presents the state's 1975 population density.

Population projections for Oregon forecast a total population of 2,576,900 persons by 1980. The projected population of 3,076,700 persons in 1990 will represent a 19.4 percent increase over the 1980 population. It is estimated that between 1990 and the year 2000, the population will increase 14.8 percent and reach 3,532,600 persons by 2000.[8]

3.3 ECONOMY

3.3.1 Major Business Sectors

Oregon's economy has traditionally been built upon its natural resources. Lumber, agriculture/food processing, fishing, and tourism and recreation are the state's primary industries. Currently, however, the manufacturing field is growing and increasing its contribution to the state's economy. In 1978, the manufacturing sector employed 218,100 workers, a 26.6 percent increase over the 1970 manufacturing employment total of 172,300 persons. In addition to manufacturing, retail trade, services, and state and local government are the main sector's of Oregon's economy. In conjunction with the manufacturing sector, they employed a total of 741,900 workers in 1978--71.4 percent of the total number of person's employed in Oregon during that year.[9,10,11] Table 3-2 inventories the major economic activities of each county in the state.

FIGURE 3-1
COUNTIES OF THE STATE OF OREGON (7)

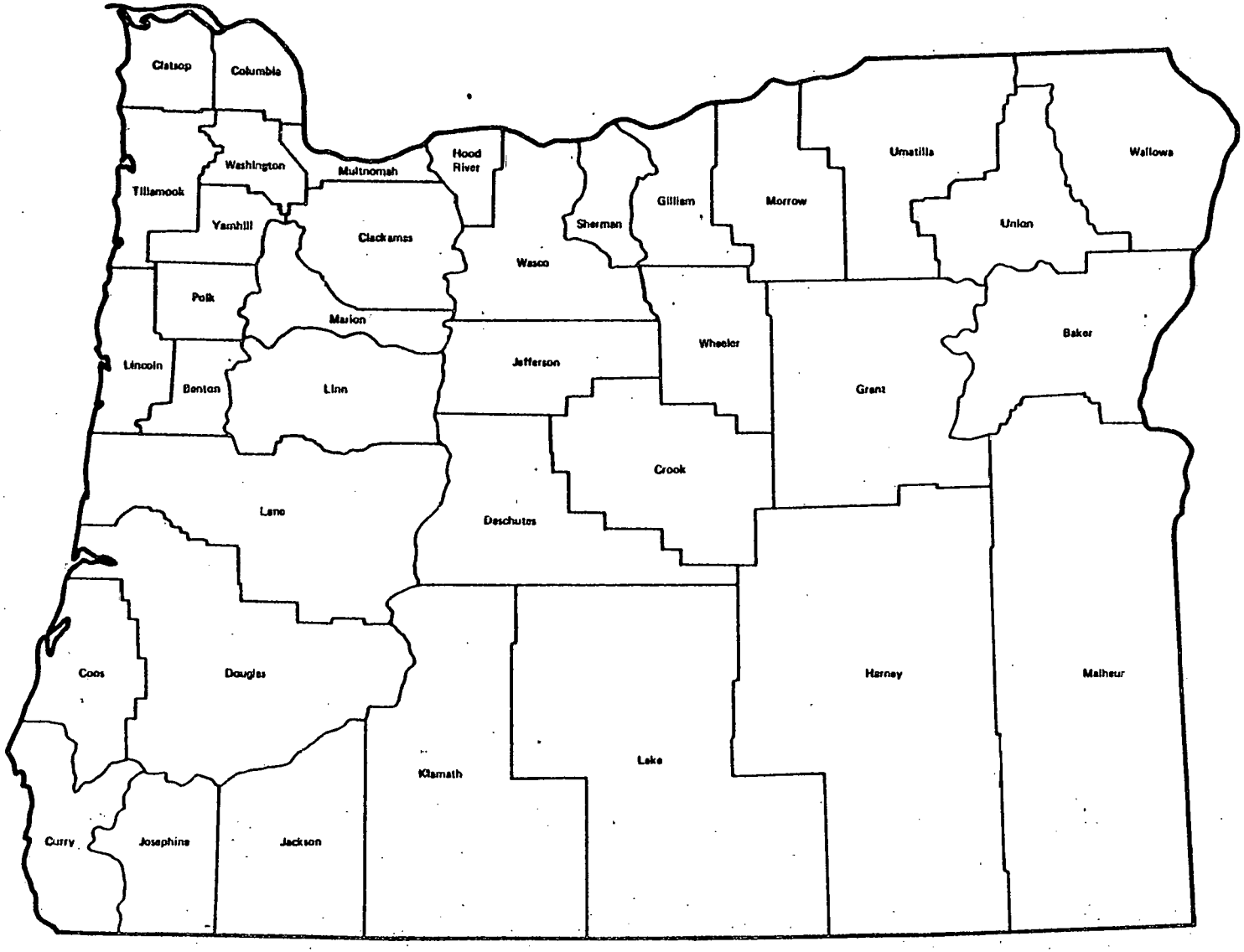


FIGURE 3-2
STANDARD METROPOLITAN STATISTICAL AREAS IN OREGON [7]

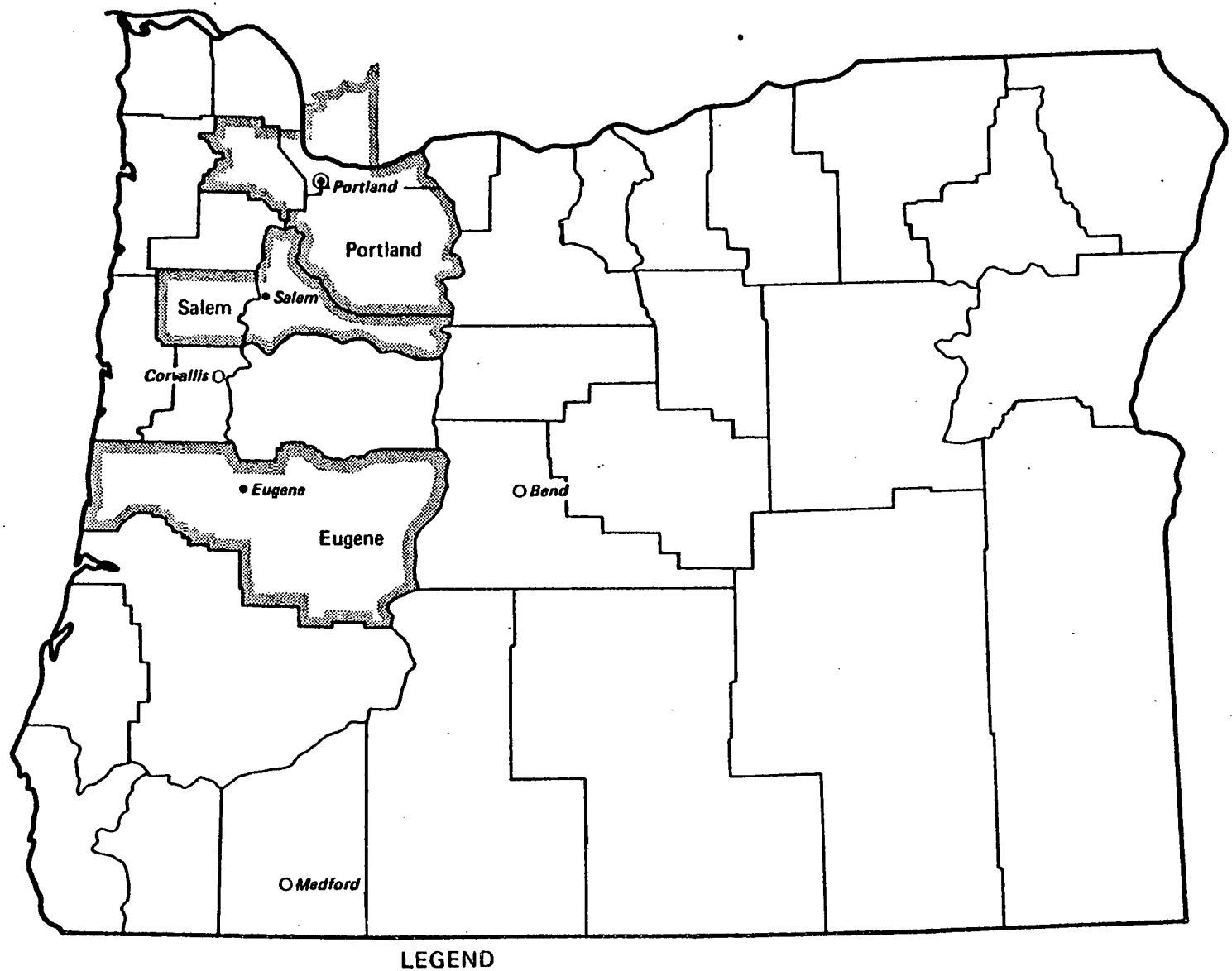


TABLE 3-1

STANDARD METROPOLITAN STATISTICAL AREAS

IN THE STATE OF OREGON(3,4)

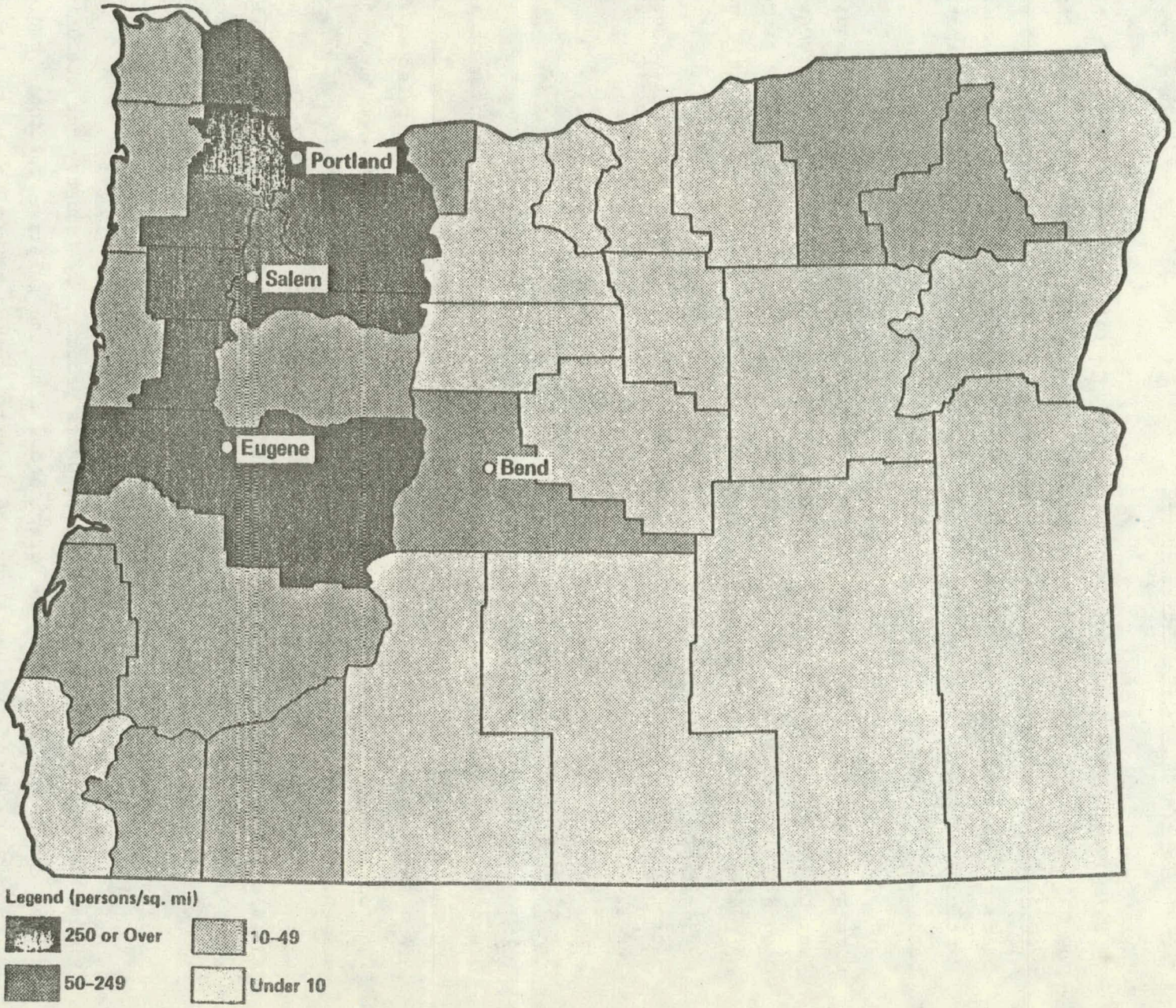
	POPULATION		
SMSA	1970	1977	1978
Eugene	213,358	250,100	257,700
Portland (Oregon portion)	878,676	953,200	968,600
Salem	186,658	219,200	225,900
State Total	2,091,533	2,385,000	2,444,000

TABLE 3-2

MAJOR ECONOMIC ACTIVITIES
IN OREGON BY COUNTY(8)

Counties	Major Economic Activities
Linn, Jefferson, Yamhill, Lane, Douglas, Josephine, Jackson, Columbia, Klamath	Forestry
Deschutes, Crook, Wheeler	Forestry, Agriculture
Coos, Curry, Lincoln, Tillamock, Clatsop	Forestry, Fisheries
Lake, Harney, Malheur, Grant, Baker	Agriculture
Wallowa	Tourism
Hood River, Wasco, Sherman, Gilliam, Morrow, Umatilla, Union	Agriculture, Tourism
Washington, Multnomah, Clackamas	Manufacturing
Polk, Marion	Government
Benton	Government, University, Manufacturing

FIGURE 3-3
POPULATION DENSITY BY COUNTY: OREGON, 1975 (2)



3.3.2 Employment and Per Capita Income

In 1978, there were 1,192,000 persons in Oregon's civilian labor force, of which 709,000 were male and 483,000 were female. This represented a total labor force participation rate of 65.7 percent, which was above the 1978 national rate of 63.2 percent. In addition, the state's male (79.4 percent) and female (52.5 percent) participation rates were above the 1978 national male and female participation rates of 77.9 percent and 50.0 percent, respectively.[1]

During the same year, per capita income in Oregon was $7,839, approximately equivalent to the 1978 U.S. average of $7,810; and there were roughly 204,000 persons in Oregon living below the poverty level in 1975. This figure represented 8.9 percent of Oregon's total 1975 population compared with 11.4 percent of the 1975 U.S. population.[1] Tables 3-3, 3-4, and 3-5 present an overview of Oregon's and the nation's labor force, per capita income and person's living below the poverty level.

3.3.3 Gross State Product

Oregon's gross state product (GSP) by industry has been estimated by first obtaining the gross national product (GNP) and U.S. employee compensation, shown in Table 3.6. The ratio of these two measures was then computed and multiplied by the figures for employee compensation for the state. Table 3-7 presents both employee compensation and the estimated Oregon GSP by industry for the years 1976, 1977, and 1978. During this period, the state's GSP rose from approximately $17.5 million to $23.6 million, remaining at 1.1 percent of the 1976 and 1978 GNP of $1.6 trillion and $2.0 trillion, respectively.[12,13,14] During the same 3-year period, personal income in Oregon rose from $11.4 million (1.1 percent of U.S. income) to $15.4 million (1.2 percent of U.S. income) in current dollars.[15]

Figure 3-4 represents the percentage of gross product, by industry for the United States and Oregon in 1978. The graph shows that the relative portions of gross product represented by several of the industries were approximately the same in Oregon as they were in the nation. The output associated with construction, durable goods, wholesale and retail trade, and state and local government, however,

TABLE 3-3

U.S. AND OREGON LABOR FORCES (THOUSANDS), 1976, 1978(1)

	1976			1978		
	Total	Male	Female	Total	Male	Female
U.S.	94,773	56,359	38,414	100,420	58,542	41,878
Oregon	1,069	640	429	1,192	709	483
Percent of U.S.	1.13	1.14	1.12	1.19	1.21	1.15

TABLE 3-4

PER CAPITA INCOME (CURRENT DOLLARS) IN THE U.S. AND OREGON FOR SELECTED YEARS(1)

Year	U.S.	Oregon	Rank	Percent of U.S.
1960	2,201	2,195	18	100
1970	3,893	3,677	24	94
1975	5,861	5,769	24	98
1978	7,810	7,839	19	100

TABLE 3-5

PERSONS BELOW THE POVERTY LEVEL (THOUSANDS) IN THE U.S. AND OREGON, 1969, 1975(1)

	U.S.		Oregon	
Year	Number	Percent	Number	Percent
1969	27,125	13.7	235	11.5
1975	23,991	11.4	204	8.9

TABLE 3-6

GROSS NATIONAL PRODUCT, U.S. EMPLOYEE COMPENSATION AND RATIO OF PRODUCT TO COMPENSATION (BILLIONS OF DOLLARS) BY INDUSTRY(12,13,14)

Industry	1976			1977			1978		
	Product	Compensation	Ratio	Product	Compensation	Ratio	Product	Compensation	Ratio
1. Farms	46.4	18.682	2.4837	49.2	19.759	2.4900	59.5	27.880	2.1341
2. Agricultural services, forestry & fisheries	5.0	3.919	1.2758	5.9	4.568	1.2916	7.1	5.426	1.3085
3. Mining	42.5	15.756	2.6974	48.2	17.556	2.7455	55.1	20.552	2.6810
4. Construction	74.5	61.301	1.2153	83.5	68.886	1.2121	95.3	79.777	1.1946
5. Nondurable goods	166.5	100.031	1.6645	181.9	110.347	1.6484	196.5	121.450	1.6179
6. Durable goods	236.7	171.593	1.3794	274.1	196.235	1.3968	312.6	223.969	1.3957
7. Transportation	62.6	43.494	1.4393	70.4	49.560	1.4205	81.4	56.013	1.4532
8. Communication	45.2	21.701	2.0829	49.5	24.318	2.0355	55.9	27.953	1.9999
9. Electric, gas, sanitary services	43.3	13.280	3.2605	48.4	14.852	3.2588	53.5	16.682	3.2070
10. Wholesale and retail trade	296.7	177.385	1.6726	323.1	193.985	1.6656	360.5	217.952	1.6540

TABLE 3-6 (concluded)

GROSS NATIONAL PRODUCT, U.S. EMPLOYEE COMPENSATION AND RATIO OF PRODUCT TO COMPENSATION (BILLIONS OF DOLLARS) BY INDUSTRY(12,13,14)

Industry	1976			1977			1978		
	Product	Compensation	Ratio	Product	Compensation	Ratio	Product	Compensation	Ratio
11. FIRE*	235.2	57.308	4.1041	267.8	66.548	4.0242	298.7	76.165	3.9217
12. Services	207.4	173.153	1.1978	234.8	194.692	1.2060	268.7	221.939	1.2107
13. Federal Gov.	57.6	63.425	0.9087	59.0	67.148	0.8790	62.4	72.097	0.8656
14. State and Local Gov.	127.9	123.092	1.0392	138.1	133.026	1.0380	149.9	149.9	1.0380
TOTAL	1,647.6	1,044.120		1,833.9	1,161.480		2,057.1	1,312.219	

*Finance, Insurance, Real Estate

TABLE 3-7

EMPLOYEE COMPENSATION AND ESTIMATED GROSS STATE PRODUCT (MILLIONS OF DOLLARS) BY INDUSTRY FOR OREGON(13,14)

Industry	1976		1977		1978	
	Compensation	GSP	Compensation	GSP	Compensation	GSP
1. Farms	239.8	595.6	135.4	337.1	309.8	661.1
2. Agricultural services	71.0	90.6	94.0	121.4	121.0	158.3
3. Mining	24.0	64.7	31.0	85.1	44.0	118.0
4. Construction	719.0	873.8	897.0	1,087.3	1,089.0	1,300.9
5. Nondurable goods	684.0	1,138.5	781.0	1,287.4	848.0	1,372.0
6. Durable goods	2,174.0	2,998.8	2,608.0	3,642.9	3,101.0	4,328.1
7. Transportation	532.0	765.7	621.0	882.1	702.0	1,020.1
8. Communication	220.0	458.2	256.0	521.1	304.0	608.0
9. Electricity, gas, san. serv.	137.0	446.7	159.0	518.1	179.0	574.1
10. Wholesale and retail trade	2,192.0	3,666.3	2,508.0	4,177.3	2,911.0	4,814.8
11. FIRE*	561.0	2,302.4	723.0	2,909.5	869.0	3,408.0
12. Services	1,739.0	2,082.9	2,038.0	2,457.8	2,362.0	2,859.7
13. Federal Government	460.0	418.0	508.0	446.5	567.0	490.8
14. State and Local Government	1,540.0	1,600.4	1,659.0	1,722.0	1,825.0	1,894.4
TOTAL	11,292.8	17,502.6	13,018.4	20,195.6	15,231.8	23,608.2
Percent of U.S.	1.1	1.1	1.1	1.1	1.2	1.1

*Finance, Insurance, Real Estate

represented a slightly larger percentage of Oregon's GSP than the nation's GNP. Additionally, mining represented 2.68 percent of the nation's output and only 0.5 percent of the state's, nondurable goods represented 9.55 pecent of the U.S. output and 5.81 percent of Oregon's output, and both the state's services and federal government sectors produced outputs approximately 1.0 percent below the nation's services and federal government sectors.[12,13,14]

3.4 AGRICULTURE

The principal crops produced in Oregon in 1978 were grain, forage, and miscellaneous field crops (6,138,000 tons); seed crops (152,000 tons); tree fruit and nuts (296,000 tons); berries (41,000 tons); and vegetables (852,000 tons). Of these, only the berry and tree fruit and nut totals represent a decrease in production over the 1976 production figures. The value of all crops produced in 1978 was estimated at $762,000,000, which is 12.0 percent more than the 1977 production value and 6.0 percent more than the 1976 value.[16-22]

In addition to crop production, the state's principal livestock production in 1978 included cattle and calves (477,225,000 pounds); hogs (32,970,000 pounds); sheep and lambs (24,442,000 pounds); turkeys (1,300,000 pounds); and chickens (2,800,000 pounds). All livestock groups declined in production from 1976 to 1978, but as a whole, production decreased less than 1.0 percent on an average annual basis. The value of all livestock produced was approximately $338,165,000 in 1976, $338,529,000 in 1977, and $323,768,000 in 1978.[16-22] (The 1978 figure, however, does not include the value for milk production.) Table 3-8 presents an inventory of Oregon's principal crops and the state's rank in the nation's agriculture.

3.5 SCHOOLS AND HOSPITALS

Several institutions in Oregon are potential sources of radioactive wastes through the use of radionuclides. Colleges and unversities are such potential sources; Oregon has 153 universities and colleges with a total enrollment of approximately 146,168 students in 1977 and 146,349 students the following year.[24,25] In 1977, 24 institutions had enrollments of fewer than 2,500 students; 7 had student populations numbering between 2,500 and 4,999; 2 had between 5,000 and 9,999 students; and 5 had enrollments of 10,000 or more students.[25]

FIGURE 3-4
PERCENT OF GROSS PRODUCT BY INDUSTRY:
UNITED STATES AND OREGON, 1978[12,13,14]

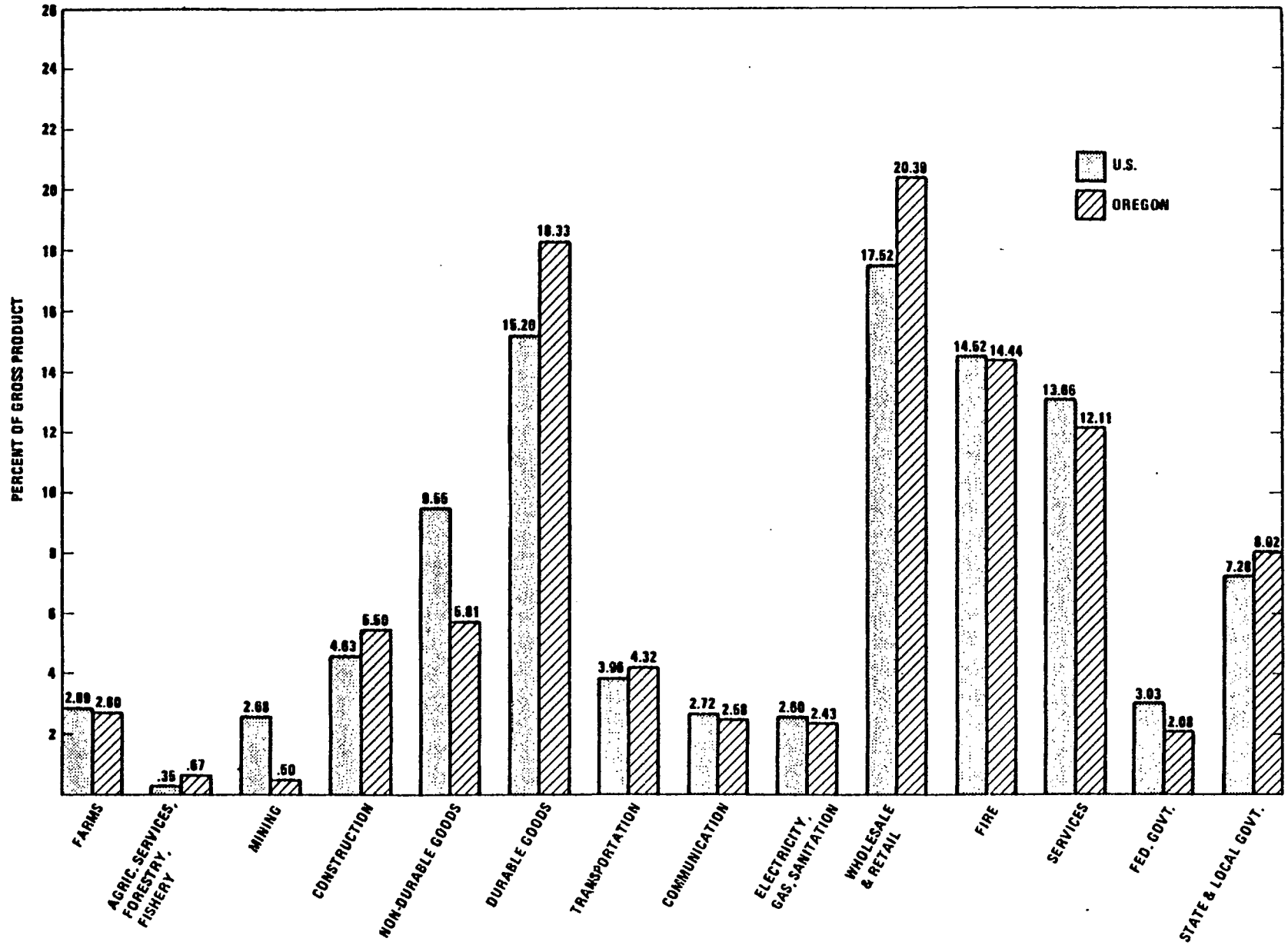


TABLE 3-8

OREGON'S RANK IN THE NATION'S AGRICULTURE, 1979(23)

Commodity	Rank Among States	Production as a Percent of U.S. Totals
Crops:		
Prunes and Plums	2	4.0
Snap Beans	2	19.0
Strawberries	2	7.0
Sweet Cherries	2	21.0
Pears	3	24.0
Sweet Corn	3	10.0
Green Peas	4	7.0
Potatoes	4	7.0
Carrots	5	3.0
Cranberries	5	4.0
Tart Cherries	6	2.0
Apples	9	2.0
Barley	11	2.0
Cucumbers	13	2.0
Peaches	15	0.5
Wheat (white, spring durum)	15	3.0
Oats	18	0.8
Dairy Products:		
Butter	13	1.4
Cheese (excluding cottage cheese	19	0.9

In addition, Oregon had 87 hospitals with a total of 11,568 beds in 1978. Approximately 72 of these institutions had fewer than 250 beds, 10 had between 250 and 499 beds, and another 5 had 500 or more beds.[26] In 1974, Oregon had 88 hospitals with a total of 12,088 beds, and in 1976, there were 88 hospitals in Oregon with a total of 12,076 beds. The American Hospital Association explains the decrease in the number of hospitals, a national trend since 1967, as the result of the loss of specialty hospitals, predominantly from the closing of tuberculosis hospitals and the removal of hospital beds from psychiatric hospitals.[27,28]

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4. GOVERNMENTAL AND PUBLIC ASPECTS

This section presents an overview of Oregon's state government and identifies the government institutions and agencies with statutory or other responsibilities affecting the generation, handling, and disposal of radioactive wastes within the state. The identities and attitudes of state officials and other organizations impinging on this issue are presented in the text, and where possible, in available representative print media.

4.1 MAJOR POLITICAL PARTIES

The Republican Party has a larger following in Oregon than the Democratic Party has significant following in the major cities such as Portland, Eugene, and Salem, with the Republican Party having significant members in the rural areas of the state. Currently, the Democrats hold 78 percent of the 30 seats in the Oregon Senate and 57 percent of the 60 seats in the Oregon House of Representatives. Both of Oregon's United States Senators and one Congressional Representative belong to the Republican Party and the other three United States Congressional Representatives belong to the Democratic Party.[1]

4.2 CONGRESSIONAL REPRESENTATIVES

Oregon's two Congressional Senators are Mark O. Hatfield (Republican) and Bob Packwood (Republican).[1] Senator Packwood is in favor of having electrical generation capacity based on a mixture of fossil fuel and nuclear energy. As such, he does not support a moritorium on the construciton of nuclear generating facilities. In contrast, however, Senator Packwood feels that the need for additional nuclear-fuled plants may be reduced by increases in conservation and reliance on solar energy. As the ranking minority member and the exofficio member of all subcommittees of the Committee on Commerce, Science and Transportation, the Senator may become involved in issues concerning the regulation of interstate carriers and highway safety.[2,3]

Senator Hatfield has supported legislation for a 2-year moratorium on the construction permits for nuclear electric generating facilities by the Nuclear

Regulatory Commission. In addition, the Senator Hatfield may become involved in issues concerning nuclear waste because he is the ranking minority member of the Committee on Energy and Natural Resources. This committee is responsible for all proposed legislation, messages, and petitions concerning energy policy, energy regulation, energy research and development, and the nomilitary development of nuclear energy.[3,4]

Oregon is also represented in the United States Congress by four Representatives, who are presented in Table 4-1 in conjunction with Oregon's Senators.[1] The table also indicates the congressional committees the Senators and Representative serve on and their length of service in Congress. Additionaly, the location of Oregon's congressional districts is indicated in Figure 4-1.

4.3 STATE GOVERNMENT

The Oregon government is divided into three branches, as required by the Oregon Constitution (adopted in 1857). The specific branches are the executive, legislative, and judicial.[1]

4.3.1 Executive Branch

The executive branch of government, which administers state agencies and enforces state laws, is headed by six independently elected officials. The Governor, Secretary of State, and Treasurer, in addition to their individual duties, jointly form the Land Borad. While the Governor acts as chairman of the board, the three officials have equal responsibility. The Attorney General, Superintendent of Public Instruction, and Labor Commissioner are provided by statute to carry out the special duties of their respective divisions.[1]

Governor

The present Governor, Victor G. Ateyeh (Republican), took office in January 1979. The Governor advises and recommends a budget to the State Assembly, coordinates the activities of state agencies, and serves as

TABLE 4-1

OREGON MEMBERS OF THE UNITED STATES CONGRESS (3,5)

State Delegate	District	Political Affiliation	Beginning of Present Service	Congressional Committees
Senators:				
Mark O. Hatfield	Entire State	Republican	1976	Committee on Appropriations, Chairman - Exofficio member of all Subcommittees - Subcommittee on Energy and Water Development, Chairman - Subcommittee on Foreign Operations - Subcommittee on Labor, Health and Human Services Education - Subcommittee on the Legislative Branch Committee on Energy and Natural Resources, Ranking Minority Member - Subcommittee on Energy Conservation and Supply - Subcommittee on Water and Power - Subcommittee on Public Lands and Reserved Water Committee on Rules and Administration, Ranking Minority Member Joint Committee on Printing Joint Committee on the Library
Bob Packwood	Entire State	Republican	1969	Committee on Commerce, Science and Transportation, Chairman - Ex officio member of all subcommittees - Subcommittee on Business, Trade, and Tourism

TABLE 4-1 (continued)

OREGON MEMBERS OF THE UNITED STATES CONGRESS (3,5)

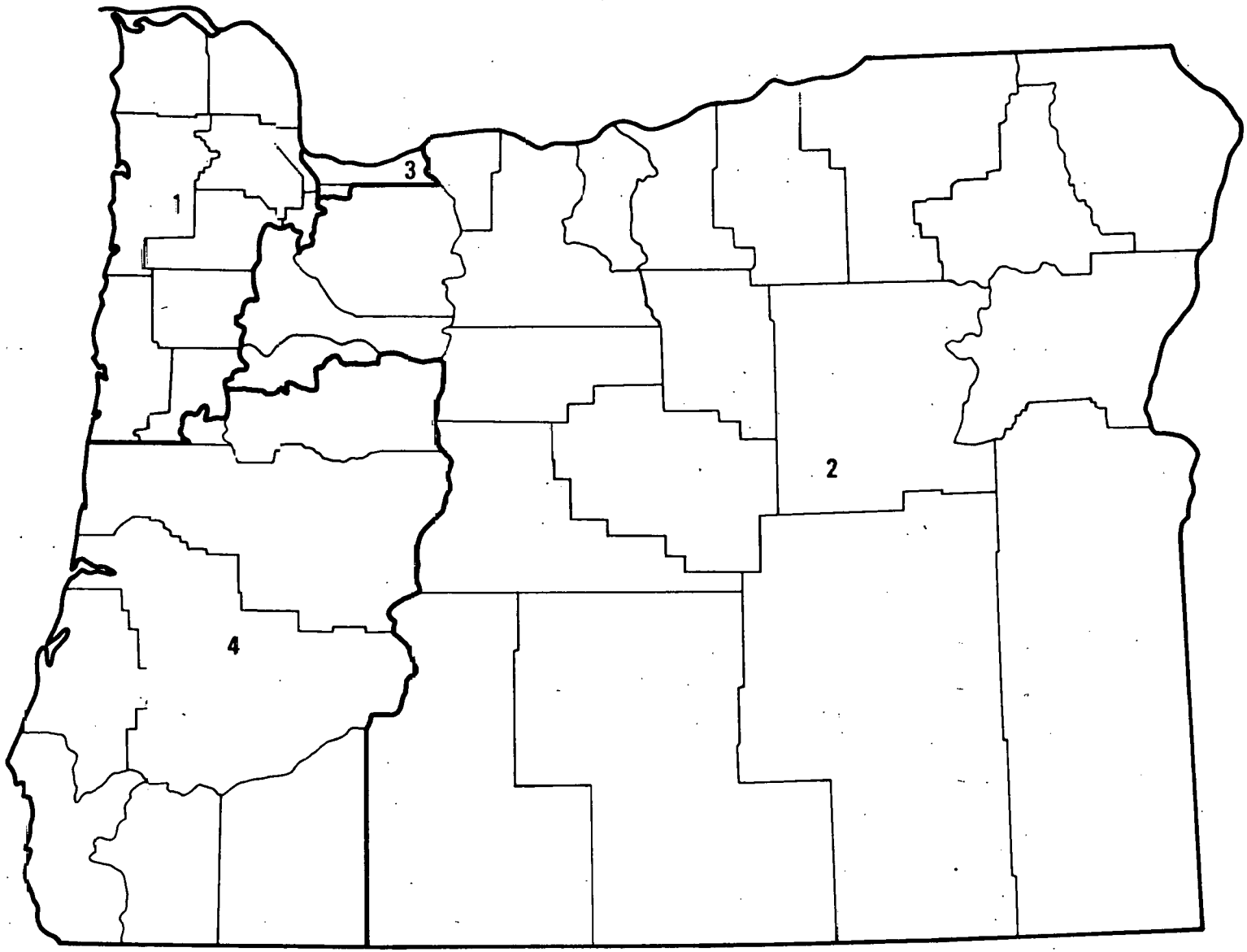
State Delegate	District	Political Affiliation	Beginning of Present Service	Congressional Committees
Bob Packwood (con't)				Committee on Finance - Subcommittee on Taxation and Debt, Chairman - Subcommittee on Savings, Pensions, and Investment Policy - Subcommittee on Health Select Committee on Small Business Joint Committee on Taxation
Representatives:				
Les AuCoin	First	Democrat	1975	Committee on Appropriations - Subcommittee on the Interior - Subcommittee on Transportation
Denny Smith	Second	Republican	1981	Committee on Veteran's Affairs - Subcommittee on Education, Training, and Employment - Subcommittee on Compensation, Pension, and Insurance Committee on Interior and Insular Affairs - Subcommittee on Insular Affairs - Subcommittee on Energy and the Environment

TABLE 4-1 (continued)

OREGON MEMBERS OF THE UNITED STATES CONGRESS (3,5)

State Delegate	District	Political Affiliation	Beginning of Present Service	Congressional Committees
Ron Wyden	Third	Democrat	1981	Committee on Energy and Commerce - Subcommittee on Energy Conservation and Power - Subcommittee on Health and the Environment - Subcommittee on Investigation and Oversight Committee of Small Business - Subcommittee on Export Opportunities and Special Small Business Problems
Jim Weaver	Fourth	Democrat	1975	Committee on Agriculture - Subcommittee on Forests, Family Farms, and Energy, Chairman - Subcommittee on Wheat, Soybeans, and Feed Grains Committee on Interior and Insular Affairs - Subcommittee on Energy and The Environment - Subcommittee on Public Lands and National Parks - Subcommittee on Water and Power Resources

FIGURE 4-1
OREGON CONGRESSIONAL DISTRICTS(1)



Commander-In-Chief of the state military forces. He may call special sessions of the Oregon Legislature and may veto legislation or individual items or appropriation bills.(1)

In 1979, Governor Atiyeh was aginst shutting down the Trojan nuclear generating facility; nevertheless, he delayed licensing Pebble Springs for six months because of the nuclear accident at Three Mile Island. In addition, the Three Mile Island incident prompted Governor Atiyeh to establish the Emergency Response System for the Trojan Power Plant. The system establishes open communicaton channels between the Governor and the Radiation Control Section of the Department of Human Resources, the Department of Energy, state emergency services and county emergency operations in every Oregon county and several Washington counties. In the event of an accident at the Trojan facility, only Governor Ateyeh would make the decisions, direct the emergency operations and issue press releases. Governor Atiyeh established the system to prevent confusing and conflicting directives and information during an accident and to prevent needless evacuation in the event of a false alarm.(6)

Lieutenant Governor

According to the Oregon Constitution, Oregon does not have a Lieutenant Governor. Should a vacancy occur in the Office of the Governor the order of gubernatorial succession is: Secretary of State, State Treasurer, President of the Senate, and Speaker of the House.(1)

Secretary of State

The present Secretary of State is Norma Paulus (Republican), who was elected in 1976. The Secretary of State is the auditor of public accounts and chief election officer for Oregon, keeps a record of official acts of the Legislative Assembly and executive department, and is custodian of the Great Seal of the State of Oregon. As a member of the State Land Board, the Secretary of State shares responsibility with the Governor and State Treasurer for supervising the administration of state-owned lands. The secretary also sits on the Public Contact Review Board.(1)

Attorney General

The Attorney General of the State of Oregon is James A. Redden (Democrat), elected in 1976. The Attorney General acts as the state's legal advisor. He has full charge and control of all legal business of all state departments, boards and commissions, and state officers which require the services of legal counsel. In addition, he consults with and advises the district attorneys in Oregon's 36 counties in criminal matters, investigates criminal matters upon the request of the Governor, and handles criminal cases on appeal to Oregon's appellate courts.[1]

Other Elected Officials

Other major elected state officials include Clay Myers, the State Treasurer; Verne A. Duncan, Superintendent of Public Instruction; and Mary Wendy Roberts, Labor Commissioner.[1]

State Agencies

The Oregon Department of Human Resources, Health Division, Radiation Control Section is authorized to review the regulations and standards concerning the handling, disposal, and control of all radiation sources within Oregon. They are also responsible for licensing the nuclear facilities and for monitoring the disposal and transportation of nuclear waste in the state. The Department of Energy is responsible for siting and regulating the location, construction, and operation of all nuclear installations in Oregon, in addition to electric power generating facilities, pipelines, transmission lines, and solar collecting facilities.[1,6,7]

In addition to these agencies, other state agencies in Oregon, such as the Department of Agriculture, the Intergovernmental Relations Divison of the Executive Department or the Department of Energy, may become involved in the nuclear energy or radioactive waste disposal issue because of interest or jurisdiction in the areas of land-use planning and environmental management or protection. Figure 4-2 inventories Oregon's state agencies.

FIGURE 4-2
LIST OF STATE AGENCIES (8)

OREGON

ADJUTANT GENERAL
Richard A. Miller, Adjutant General and Chief of Staff to the Governor
Military Department
2150 Fairgrounds Rd., N.E.
Salem OR 97303
(503) 378-3981

ADMINISTRATION
Laurence R. Sprecher, Director
Executive Department
240 Cottage St., S.E.
Salem OR 97310
(503) 378-3104

AERONAUTICS
Paul E. Burket, Administrator
Aeronautics Division
Department of Transportation
3040 25th St., S.E.
Salem OR 97310
(503) 378-4880

AGING
Marvin M. Janzen, Administrator
Office of Elderly Affairs
Department of Human Resources
772 Commercial St., S.E.
Salem OR 97310
(503) 378-4728

AGRICULTURE
Leonard Kunzman, Director
Department of Agriculture
Agriculture Bldg.
635 Capitol St., N.E.
Salem OR 97310
(503) 378-4152

AIR POLLUTION CONTROL
E. Jack Weathersbee, Administrator
Air Quality Control Division
Department of Environmental Quality
Yeon Bldg.
522 S.W. 5th Ave.
P.O. Box 1760
Portland OR 97207
(503) 229-5397

ALCOHOLISM
Richard R. Runyon, Assistant Administrator
Programs for Alcohol and Drug Problems
Mental Health Division
Department of Human Resources
2575 Bittern St., N.E.
Salem OR 97310
(503) 378-2163

ARCHIVES AND RECORDS
James D. Porter, State Archivist
Archives Division
Office of the Secretary of State
1005 Broadway, N.E.
Salem OR 97310
(503) 378-4241

ARTS AND HUMANITIES
Peter Hero, Executive Director
Oregon Arts Commission
835 Summer St., N.E.
Salem OR 97301
(503) 378-3625

ATTORNEY GENERAL
James A. Redden, Attorney General
Department of Justice
100 State Office Bldg.
Salem OR 97310
(503) 378-6002

AUDIT
George Renner, Supervisor
Audits Division
Office of the Secretary of State
112A Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-3329

BANKING
John B. Olin, Superintendent of Banks
Department of Commerce
280 Court St., N.E.
Salem OR 97310
(503) 378-4140

BUDGET
Robert W. Smith, Administrator
Budget and Management Division
Executive Department
240 Cottage St., S.E.
Salem OR 97310
(503) 378-3103

CHILD WELFARE
J. N. Peet, Administrator
Children's Services Division
Department of Human Resources
198 Commercial St., S.E.
Salem OR 97310
(503) 378-4374

CIVIL DEFENSE
Harvey L. Latham, Administrator
Emergency Services Division
Executive Department
43 State Capitol
Salem OR 97310
(503) 378-4124

CLERK OF THE HOUSE
Winton J. Hunt, Chief Clerk
House of Representatives
H271 State Capitol
Salem OR 97310
(503) 378-8880

COMMERCE
Cornelius C. Bateson, Director
Department of Commerce
428 Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-4100

COMMUNITY AFFAIRS
Donald L. Jones, Administrator
Intergovernmental Relations Division
Executive Department
306 State Library Bldg.
Summer and Court Sts.
Salem OR 97310
(503) 378-5978

CONFLICT OF INTEREST
Michael K. Friel, Executive Director
Oregon Government Ethics Commission
102 Public Service Bldg.
Capitol Mall
Salem OR 97310
(503) 378-5105

CONSUMER AFFAIRS
Caroline Wilkins, Administrator
Consumer Services Division
Department of Commerce
104 Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-4320

CORRECTIONS
Robert J. Watson, Administrator
Corrections Division
Department of Human Resources
2575 Center St., N.E.
Salem OR 97310
(503) 378-2467

COURT ADMINISTRATION
Loren D. Hicks, State Court Administrator
Supreme Court
Supreme Court Bldg.
1147 State St.
Salem OR 97310
(503) 378-6046

DATA PROCESSING
Gerald C. Schmitz, Administrator
Data Systems Division
Executive Department
625 Trade St., S.E.
Salem OR 97310
(503) 378-3161

DRUG ABUSE
Richard R. Runyon, Assistant Administrator
Programs for Alcohol and Drug Problems
Mental Health Division
Department of Human Resources
2575 Bittern St., N.E.
Salem OR 97310
(503) 378-2163

ECONOMIC DEVELOPMENT
Daniel L. Goldy, Director
Department of Economic Development
Loyalty Bldg., 9th Fl.
317 S.W. Alder St.
Portland OR 97204
(503) 229-5535

ECONOMIC OPPORTUNITY
Ellen Schneider, Program Manager
State Community Services Program
Department of Human Resources
772 Commercial St., S.E.
Salem OR 97310
(503) 378-4729

EDUCATION (higher)
Roy E. Lieuallen, Chancellor
Oregon State System of Higher Education
P.O. Box 3175
Eugene OR 97403
(503) 686-4153

EDUCATION (primary, secondary, and vocational)
Verne A. Duncan, Superintendent of Public Instruction
Department of Education
942 Lancaster Dr., N.E.
Salem OR 97310
(503) 378-3573

EMPLOYMENT SECURITY
Raymond P. Thorne, Administrator
Employment Division
Department of Human Resources
405 Employment Bldg.
875 Union St., N.E.
Salem OR 97311
(503) 378-3211

ENERGY
Fred Miller, Director
Department of Energy
111 Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-4128

ENVIRONMENTAL AFFAIRS
William H. Young, Director
Department of Environmental Quality
Yeon Bldg.
522 S.W. 5th Ave.
P.O. Box 1760
Portland OR 97207
(503) 229-5696

FEDERAL-STATE RELATIONS
Donald L. Jones, Administrator
Intergovernmental Relations Division
Executive Department
306 State Library Bldg.
Summer and Court Sts.
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(503) 378-5978

FINANCE
Laurence R. Sprecher, Director
Executive Department
240 Cottage St., S.E.
Salem OR 97310
(503) 378-3104

FISH AND GAME
John R. Donaldson, Director
Department of Fish and Wildlife
506 S.W. Mill St.
P.O. Box 3503
Portland OR 97208
(503) 229-5551

FOOD AND DRUGS
Joe Gray, Administrator
Division of Food and Dairy
Department of Agriculture
Agriculture Bldg.
635 Capitol St., N.E.
Salem OR 97310
(503) 378-3790

FORESTRY
J. E. Schroeder, State Forester
Forestry Department
2600 State St.
Salem OR 97310
(503) 378-2511

GENERAL SERVICES
Corinne Hayen, Director
Department of General Services
General Services Bldg.
1225 Ferry St., S.E.
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(503) 378-4658

GEOLOGY
Donald A. Hull, State Geologist
Department of Geology and Mineral Industries
1069 State Office Bldg.
1400 S.W. 5th Ave.
Portland OR 97201
(503) 229-5580

HANDICAPPED
Fred M. Tolleson, Coordinator
Governor's Committee on Employment of the Handicapped
Office of the Governor
208 Employment Bldg.
875 Union St., N.E.
Salem OR 97310
(503) 378-4545

HEALTH
Kristine M. Gebbie, Administrator
Health Division
Department of Human Resources
930 State Office Bldg.
1400 S.W. 5th Ave.
P.O. Box 231
Portland OR 97201
(503) 229-5032

HIGHWAY SAFETY
Gil W. Bellamy, Administrator
Traffic Safety Commission
895 Summer St., N.E.
Salem OR 97310
(503) 378-3669

HIGHWAYS
H. S. Coulter, State Highway Engineer
Highway Division
Department of Transportation
Transportation Bldg.
Capitol Mall
Salem OR 97310
(503) 378-6891

HISTORIC PRESERVATION
David G. Talbot, State Parks Superintendent
State Parks and Recreation Branch
Department of Transportation
Vick Bldg.
525 Trade St., S.E.
Salem OR 97310
(503) 378-5019

HOUSING
M. Gregg Smith, Administrator
Housing Division
Department of Commerce
Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-4343

HUMAN RIGHTS
Malcolm H. Cross, Administrator
Civil Rights Division
Bureau of Labor
State Office Bldg.
1400 S.W. 5th Ave.
Portland OR 97201
(503) 229-6076

INSURANCE
W. W. Fritz, Insurance Commissioner
Insurance Division
Department of Commerce
Commerce Bldg.
158 12th St., N.E.
Salem OR 97310
(503) 378-4474

JUVENILE DELINQUENCY
Richard S. Peterson, General Superintendent
Juvenile Corrections Services
Children's Services Division
Department of Human Resources
2450 Strong Rd., S.E.
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(503) 378-5341

LABOR
Bill Stevenson, Commissioner
Bureau of Labor
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LAW ENFORCEMENT PLANNING
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Law Enforcement Council
State Planning Agency
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Salem OR 97310
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LEGISLATIVE RESEARCH
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Legislative Counsel Committee
S101 State Capitol
Salem OR 97310
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LIBRARY SERVICES
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LICENSING (occupational and professional)
Cornelius C. Bateson, Director
Department of Commerce
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Capitol Mall
Salem OR 97310
(503) 378-4100

LIQUOR CONTROL
C. Dean Smith, Administrator
Oregon Liquor Control Commission
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Portland OR 97222
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MASS TRANSIT
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Department of Transportation
304 Transportation Bldg.
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MENTAL HEALTH
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Salem OR 97310
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MENTAL RETARDATION
David A. Isom, Assistant Administrator
Mental Health Division
Department of Human Resources
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Salem OR 97310
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MINING
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MOTOR VEHICLES
Harold L. Grover, Administrator
Motor Vehicles Division
Department of Transportation
1905 Lana Ave., N.E.
Salem OR 97314
(503) 378-6997

NATURAL RESOURCES
Janet McLennan, Administrative Assistant to the Governor for Natural Resources
Office of the Governor
160 State Capitol
Salem OR 97310
(503) 378-3109

NUCLEAR ENERGY
Fred Miller, Director
Department of Energy
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Capitol Mall
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OCCUPATIONAL SAFETY AND HEALTH
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Accident Prevention Division
Workers' Compensation Department
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Capitol Mall
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OIL AND GAS
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Department of Geology and Mineral Industries
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1400 S.W. 5th Ave.
Portland OR 97201
(503) 229-5580

OMBUDSMAN
Phil McLaurin, Ombudsman
Office of the Governor
160 State Capitol
Salem OR 97310
(503) 378-4582 or 1-800-452-7813

PARKS
David G. Talbot, State Parks Superintendent
State Parks and Recreation Branch
Department of Transportation
Vick Bldg.
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(503) 378-5019

PERSONNEL
Richard J. Burke, Administrator
Personnel Division
Executive Department
100 Public Service Bldg.
Capitol Mall
Salem OR 97310
(503) 378-3140

PLANNING
Donald L. Jones, Administrator
Intergovernmental Relations Division
Executive Department
306 State Library Bldg.
Summer and Court Sts.
Salem OR 97310
(503) 378-5978

POLICE
Robert R. Fisher, Superintendent
Department of State Police
107 Public Service Bldg.
Capitol Mall
Salem OR 97310
(503) 378-3720

PRINTING AND PUBLISHING
John R. Chamberlain, State Printer
Printing Division
Department of General Services
General Services Bldg.
1225 Ferry St., S.E.
Salem OR 97310
(503) 378-3564

PROBATION AND PAROLE
Nancy Peck Farrar, Executive Director
Board of Parole
2575 Center St., N.E.
Salem OR 97310
(503) 378-2334

PUBLIC DEFENDER
Gary D. Babcock, Public Defender
Office of the Public Defender
Mill Creek Office Park
555 13th St., N.E.
Salem OR 97310
(503) 378-3349

PUBLIC UTILITIES
Charles Davis, Commissioner
Public Utility Commissioner
Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-6611

PURCHASING
Lee E. Moore, Administrator
Purchasing Division
Department of General Services
General Services Bldg.
1225 Ferry St., S.E.
Salem OR 97310
(503) 378-4643

RAILROADS
David Astle, Assistant Commissioner
Rail–Air–Marine Program
Public Utility Commissioner
Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-6351

RETIREMENT
James L. McGoffin, Director
Public Employees Retirement Board
200 Terminal Plz.
1221 S.W. Yamhill St.
Portland OR 97205
(503) 229-6028

SECRETARY OF STATE
Norma Paulus, Secretary of State
Office of the Secretary of State
136 State Capitol
Salem OR 97310
(503) 378-4139

SECRETARY OF THE SENATE
Maribel Cadmus, Secretary of the Senate
State Capitol
Salem OR 97310
(503) 378-8168

SECURITIES
Andrew Ositis, Assistant Commissioner
Securities Section
Corporation Division
Department of Commerce
Commerce Bldg.
158 12th St., N.E.
Salem OR 97310
(503) 378-4387

SOCIAL SERVICES
Richard A. Davis, Director
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318 Public Service Bldg.
Capitol Mall
Salem OR 97310
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SOLID WASTE MANAGEMENT
Ernest A. Schmidt, Administrator
Solid Waste Division
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Yeon Bldg.
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Portland OR 97207
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Summer and Court Sts.
Salem OR 97310
(503) 378-5978

TAXATION AND REVENUE
John J. Lobdell, Director
Department of Revenue
204 State Office Bldg.
Salem OR 97310
(503) 378-3363

TOURISM
Victor B. Fryer, Manager
Travel Information Section
Department of Transportation
Transportation Bldg.
Capitol Mall
Salem OR 97310
(503) 378-6309

TRANSPORTATION
Robert A. Burco, Director of Transportation
Department of Transportation
135 Transportation Bldg.
Capitol Mall
Salem OR 97310
(503) 378-6388

TREASURER
Clay Myers, State Treasurer
Treasury Department
157 State Capitol
Salem OR 97310
(503) 378-4329

VETERANS' AFFAIRS
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Department of Veterans' Affairs
200 General Services Bldg.
1225 Ferry St., S.E.
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VITAL RECORDS/STATISTICS
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Health Division
Department of Human Resources
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WATER POLLUTION CONTROL
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WELFARE
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Adult and Family Services Division
Department of Human Resources
417 Public Service Bldg.
Capitol Mall
Salem OR 97310
(503) 378-3680

WORKMEN'S COMPENSATION
Roy G. Green, Director
Workers' Compensation Department
700 Labor and Industries Bldg.
Capitol Mall
Salem OR 97310
(503) 378-3304

4.3.2 Legislative Branch

Oregon's legislative power is vested in the Oregon Legislative Assembly, which is composed of the Oregon Senate and the House of Representatives. The state is divided into 30 legislative districts according to a 1952 reapportionment. Each district elects one senator and two representatives. As such the senate consists of 30 members and the house consists of 60 members. The senators and the representatives are each elected every 2 years.[1] Figures 4-3 and 4-4 delineate the state legislative districts.

The Legislative Assembly convenes the second Monday in January each odd numbered year. The Oregon Constitution does not limit the length of sessions, but recent sessions have lasted approximately 6 months. Special sessions of the legislature may be called by the Governor or by a majority of each house.[1]

The primary functions of the legislature are to enact laws, and finance state government. The Legislative Assembly also confirms various gubernatorial appointments and reviews the administrative rules of certain agencies. Most of the work in either house in the assembly is done in committee. The committees hear testimony on a measure, then amend the measure if necessary and return it to the house of origin for debate. The committee also has the authority to kill a measure, ending its consideration.[1]

In 1979, the Legislative Assembly introduced legislation dealing with nuclear power and low-level radioactive waste--House Bill 2570, sponsored by Representative Rick Bauman and 19 other legislative members. The bill calls for the Department of Energy to conduct a study of Three Mile Island, including the quantity of radioactive waste generated and its long-term storage. Additionally, the bill declares that the findings should be made a part of the site certificate proceedings of the Energy Facility Siting Council. Senate Bill 394, introduced by Senator Ted Hallock, was passed by the Legislature and approved by Governor Atiyeh in 1979. This law governs the transportation and disposal of radioactive waste produced in the state and prohibits the establishment, operation, and licensing of radioactive waste disposal facilities in the State of Oregon.[7] This bill is presented in Appendix B.

FIGURE 4-3
OREGON SENATORIAL DISTRICTS (1)

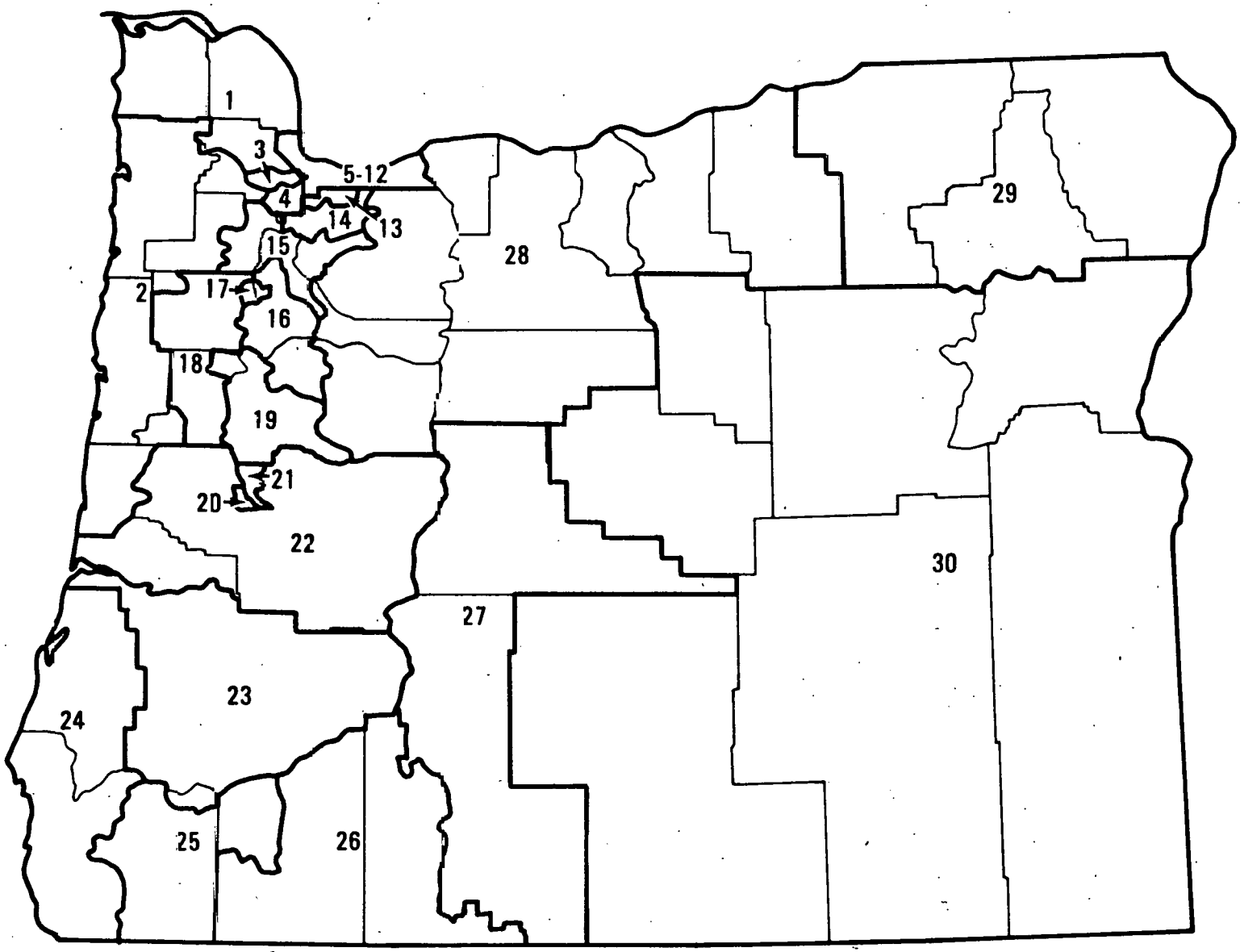
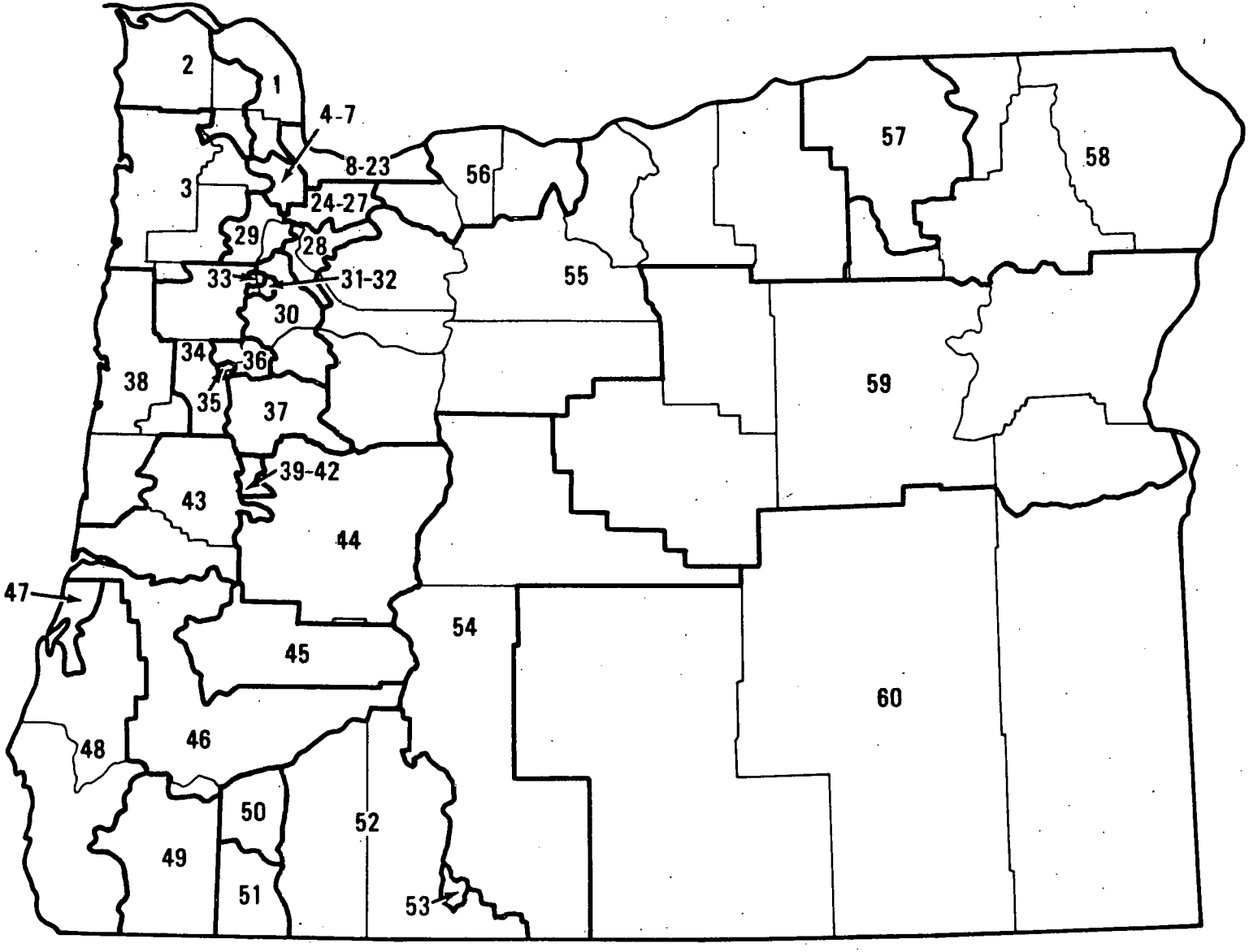


FIGURE 4-4
OREGON REPRESENTATIVE DISTRICTS (1)



4.3.3 Judicial Branch

The judicial branch consists of one supreme court, one court of appeals, one tax court, circuit courts, and district courts. Seven justices comprise the Supreme Court of Oregon and this court has general administrative authority over all other courts in the state. The supreme court justices are elected by nonpartisan state-wide ballot for a 6-year term.(1)

The Court of Appeals of Oregon is comprised of 10 judges, serving 6-year terms. The court has exclusive jurisdiction over all appeals, both civil and criminal, from the circuit and district courts. Additionally, the court of appeals is responsible for the review of state administrative agency orders, Corrections Division disciplinary actions and Board of Parole orders.(1)

The Oregon Tax Court has exclusive authority over tax questions relating to income, inheritance, gift, real property, personal property, timber and cigarette taxation, and local budget levy. Court is usually held in the county where the taxpayer resides or where the property is located. The judge serves a 6-year term and is elected on a state-wide, nonpartisan judicial ballot.(1)

The circuit courts are the state trial courts of general jurisdiction. There are 75 circuit judges serving the 36 Oregon counties, which are grouped in 20 geographical areas called judicial districts. Circuit court judges are elected for a term of 6 years.(1)

The district courts are trial courts with jurisdiction limited to $3,000 in civil cases and to some misdemeanor criminal cases, including traffic offenses. District courts may also conduct preliminary hearings on felony matters and each has a small claims department which handles disputes concerning the recovery of money or damages up to $500. The district court's geographical jurisdiction is by county. There are 51 district judges sitting in 24 of Oregon's 36 counties and judges are elected on a nonpartisan ballot in the individual county. District court judges may be assigned by the supreme court to serve other district courts or to serve temporarily as circuit judges.(1)

4.3.4 Statutory Regulations

The State of Oregon has a specific regulation concerning radioactive waste storage and one concerning the transportation of radioactive material.[9,10] These regulations, part of the Energy Facility Siting Council's Rules on radioactive waste materials, restrict the temporary storage of radioactive material and outline the procedure for transporting radioactive material in Oregon. In addition, Oregon statute 469.525, as amended by House Bill 394, states that "no waste disposal facility for any radioactive material shall be established, operated or licensed within the state of Oregon."[11] Both House Bill 394 and Oregon's regulations on radioactive materials are presented in Appendix B.

4.4 FEDERAL ACTIVITIES IN THE STATE OF OREGON

Currently, there is no ongoing, proposed, or pilot federal project or program within the state with respect to radioactive waste disposal.[7]

4.5 INTEREST GROUPS

Many interest groups concerned with nuclear issues and radioactive waste have offices in Oregon. In addition, there are many groups generally concerned with the environment who may become actively involved in nuclear energy and waste management issues if they view the issues as detrimental to their environmental interests. Following is a list of some of the major energy and environmental organizations located in Oregon and their specific areas of concern.[12,13,14]

American Society of Civil Engineers, Pacific Northwest Council: Professional group concerned with the nuclear energy field.

Clatstop County Environmental Council: Founded to preserve and protect the environment of Clatstop County.

Conservation of Urban and Rural Environment (CURE): Concerned with preserving the viable environment of Central Oregon; actively lobbies the Oregon Legislature on bills affecting the environment.

Eugene Future Power Committee, Inc.: Originally formed to fight local public utilities' plans to construct a nuclear power plant. The Committee monitors local, state, and national nuclear developments and studies alternative power sources and energy conservation options.

Friends of the Earth, Portland Group: Committed to the "preservation, restoration and rational use of the earth." Some of their interests concern the issues of nuclear power safety, strip mining, energy conservation, and water pollution.

Oregon Association of Conservation Districts: Concerned with wise land-use planning and involved in legislative action concerning environmental issues.

Oregon Environmental Council: Concerned with general environmental issues and is involved in public education and legislation concerning these issues.

Oregon Environmental Foundation: The foundation is the educational and research arm of the Oregon Environmental Council.

Oregon Environmental Health Association: A group of professionals interested in radiological health, air and water pollution control, solid-waste management, community planning, and industrial hygiene.

Sierra Club, Pacific Northwest Chapter: The Sierra Club's Energy Committee advocates a moratorium on the further construction of nuclear plants. In general, the club is concerned with the natural environment and protecting it from the adverse impacts of man and his society.

Trojan Decommissioning Alliance: Concerned with nuclear power safety and actively opposes the existence of the Trojan nuclear facility.

4.6 PRINTED MEDIA

The 21 articles presented in Appendix C represent a 2-week search of 2 major newspapers in the state and are related to the broad subject of nuclear power. Although the issues reviewed did not produce more than two articles specifically related to low-level radioactive waste, the articles are intended to present a

general indication of the coverage of radiation issues by printed media in the State of Oregon.

In addition to the articles in Appendix C, the Oregon Journal has printed approximately 24 editorials on nuclear wastes and nuclear energy, which may further indicate the media's coverage of these issues in the state.[15] During the same time the Oregon Statesman printed one editorial on the topic of nuclear energy. Neither newspaper however, has recently conducted any polls or surveys concerning nuclear energy or radioactive waste issues.[16,17]

REFERENCES

1. Oregon Blue Book, 1979-1980. Office of Secretary of the State, State of Oregon, Salem, Oregon, 1979.

2. Personal communication with Bruce Hagman, member of Senator Bob Packwood's staff, November 30, 1979.

3. Charles B. Brownson, 1980 Congressional Staff Directory. Mt. Vernon, Virginia, 1980.

4. Personal communication with Jeff Booth, Member of Senator Mark Hatfield's staff, November 11, 1979.

5. 1979 Congressional Directory, 96th Congress, 1st Session. U.S. Government Printing Office, Washington, D.C., 1979.

6. Personal communication with Dr. Perrit, Oregon Department of Human Resources, Radiation Control Section, August 19, 1980.

7. Personal communication with David Wagstaff, Oregon Department of Human Resources, Radiation Control Section, August 12, 1980.

8. The National Directory of State Agencies, 1978-1979. Information Resource Press, Washington, D.C., 1978.

9. Oregon Administrative Rules, Energy Facility Siting Council, Chapter 345, Division 50, Radioactive Waste Materials, Rule 345-50-006 through 345-50-035.

10. Oregon Administrative Rules, Energy Facility Siting Council, Chapter 345, Division 60, Transportation of Radioactive Material, Rule 345-60-001 through 345-60-007.

11. Enrolled Senate Bill 394, Oregon Legislative Assembly, 1979.

12. Thaddeus C. Tryna and Sally R. Osberg, Environmental Protection Directory. Marques Academic Press, Chicago, Illinois, 1975.

13. Onyx Group, Inc., Environment U.S.A., A Guide to Agencies, People, and Resources. R.P. Bowker Co., New York, N.Y., 1974.

14. Center for California Public Affairs, Directory of Consumer Protection and Environmental Agencies. Academic Press, Orange, New Jersey, 1973.

15. Personal communication with Sue Montgomery, The Oregon Journal, August 26, 1980.

16. Personal communication with Martha Vargine, Oregon Statesman, August 24, 1980.

17. Personal communication with Barbara Hitton, Oregon State Library, September 2, 1980.

5. SURVEY METHODOLOGY

A direct mail survey was conducted during September 1979 of all Radioactive Material License holders in the State of Oregon. Names of license holders were obtained from the Oregon Department of Human Resources. The questionnaire used is presented in Figure 5-1. This "free form" questionnaire was developed to solicit basic information necessary to generally characterize the low-level radioactive waste management practices. Questions asked were limited to those which have a direct bearing on the overall characterization of practices within the state, rather than on a detailed characterization of each facility.

Each questionnaire was sent with a transmittal letter (see Figure 5-2), general instructions (see Figure 5-3), and a return envelope. Responses were first evaluated to determine the information presented in Appendix A, List of Radioactive Material Licensees. If a response was not received, classification of "type of facility" was determined from the licensee name, if possible; if not, they were classified as "unknown." The responses received were then transposed onto a "fixed form" survey form (see Figure 5-4) which was developed based on analysis of the "free form" responses given in Figure 5-1. The information provided by the licensees was then tabulated in the formats presented in Sections 2 and 6 of this briefing book.

FIGURE 5-1

NUS RADIOACTIVE WASTE SURVEY

FACILITY NAME:

STREET ADDRESS:

CITY/STATE/ZIP:

TELEPHONE NO:

PERSON CONTACTED/TITLE:

TYPE OF FACILITY:

☐ ACADEMIC ☐ MEDICAL ☐ INDUSTRIAL

☐ OTHER DESCRIBE _____

SIZE OF FACILITY:

_____ STUDENTS _____ BEDS _____ EMPLOYEES

PROCESS(ES) WHICH GENERATE WASTE:

IS WASTE TREATED BEFORE PACKAGING? HOW?

HOW IS WASTE PACKAGED?

WHAT IS PRINCIPAL CHEMICAL & PHYSICAL COMPOSITION OF WASTE?

HOW MANY WASTE SHIPMENTS DID YOU MAKE IN:

1978 –

1977 –

1976 –

DO YOU EXPECT INCREASE OR DECREASE IN WASTE VOLUME?

PLEASE QUANTIFY WASTE DISPOSED OF IN CALENDAR YEARS 1978, 1977, 1976 ON REVERSE SIDE OF FORM. IF MORE SPACE WILL BE REQUIRED THAN IS AVAILABLE ON FORM, PLEASE PROVIDE IN SAME FORMAT ON BLANK SHEET OF PAPER.

FIGURE 5-1 (Concluded)

YEAR	ISOTOPE	ACTIVITY (CURIES)	VOLUME DISPOSED/METHOD

ADDITIONAL COMMENTS:

FIGURE 5-2

TRANSMITTAL LETTER

NUS CORPORATION
4 RESEARCH PLACE
ROCKVILLE, MARYLAND 20850
301 948-7010

September 11, 1979
BDG-PE-275

St. Judith's Hospital
600 Beauregard Avenue
Danville, Illinois 61832

Attn: Dr. J. M. Wilson

Subject: Survey of Low Level Radioactive Waste Disposal

Dear Dr. Wilson:

Maintaining free access to proper low level radioactive waste disposal sites is becoming more difficult as individual state and local jurisdictions seek to impose control upon or eliminate such activity.

NUS Corporation is conducting a survey of nuclear material licensees for EG&G Idaho and the Department of Energy to ascertain the volume and nature of waste they generate. At the present time there is not an available data base for the long range projections necessary for proper planning of future low level waste disposal facilities.

Completion of the attached survey form will enable NUS to generate such a data base for the U.S. Government. Your cooperation will assist both your organization and other users of radioactive materials in maintaining continued access to appropriate waste disposal facilities.

If you have any questions on the attached survey form or its use, please feel free to contact me at 301/948-7010.

Sincerely,

Bruce D. Guilbeault
Project Manager

BDG:dg

Enclosure

FIGURE 5-3

GENERAL INSTRUCTIONS

1. The enclosed Radioactive Waste Survey from us is self-explanatory. The following instructions provide general guidelines. If you have any specific concerns, please call Bruce Guilbeault or Don Hill on

   301-948-7010

2. If possible, all quantitative data should be taken directly from shipment records. If this is not practical, please estimate answers as accurately as possible.

3. Please explain or specify answers (where requested) as completely as possible. If additional space is needed, please use the "Additional Comments" section on the last page of this questionnaire.

4. When you have completed this questionnaire, please return it in the enclosed stamped, self-addressed envelope.

5. If your facility does not dispose of Radioactive Materials by use of the commercial radioactive material disposal sites, please fill out the survey form with the amount of material received in each year and where these Radioactive Materials received were disposed (e.g. Isotopes used in patient treatment residues decayed to background, disposed in trash, or shipped out in finished products.)

THANK YOU VERY MUCH FOR YOUR CO-OPERATION

FIGURE 5-4

FORM USED FOR TABULATION

LICENSEE NAME _____

NAME OF FACILITY _____

STREET ADDRESS _____

CITY/STATE/ZIP _____

TELEPHONE NO. _____

PERSON SUPPLYING INFORMATION _____

TITLE _____

PART I - TYPE OF FACILITY

(CHECK THE ONE CATEGORY WHICH IS MOST APPLICABLE)

MEDICAL

- ☐ HOSPITAL
- ☐ PHARMACEUTICAL MANUFACTURER
- ☐ MEDICAL RESEARCH/EDUCATION
- ☐ OTHER (SPECIFY) _____

EDUCATIONAL

- ☐ UNIVERSITY
- ☐ HIGH SCHOOL
- ☐ OTHER (SPECIFY) _____

INDUSTRIAL

- ☐ INCORPORATES RADIOACTIVITY INTO PRODUCTS
- ☐ USES RADIOACTIVITY IN PROCESS CONTROL
- ☐ COMMERCIAL POWER REACTOR
- ☐ OTHER (SPECIFY) _____

GOVERNMENTAL (NON-MEDICAL OR EDUCATIONAL)

- ☐ FEDERAL
- ☐ MILITARY
- ☐ STATE
- ☐ LOCAL

PART II - DISPOSAL METHOD

CHECK EACH DISPOSAL METHOD WHICH YOU DO EMPLOY

- ☐ SHIP TO COMMERCIAL REPOSITORY
- ☐ RELEASE TO SEWER
- ☐ COMBINE WITH COMMON REFUSE
- ☐ VENT TO ATMOSPHERE
- ☐ BURY ON-SITE
- ☐ RETURN TO VENDOR
- ☐ DISTRIBUTE IN PRODUCT FORM
- ☐ NO WASTE GENERATED
- ☐ OTHER (SPECIFY) _____

FIGURE 5-4 (Continued)

PART III - SOURCE OF RADIOACTIVE WASTE

(CHECK EACH SOURCE OF YOUR POTENTIAL RADIOACTIVE WASTE AND, IF YOU SHIP, INDICATE THE PERCENTAGE OF YOUR TOTAL SHIPPED WASTE VOLUME ORIGINATING FROM EACH SOURCE CATEGORY)

SOURCE OF RADIOACTIVITY	PERCENT OF WASTE VOLUME SHIPPED
☐ NUCLEAR REACTOR	_____
☐ NEUTRON GENERATOR	_____
☐ CYCLOTRON OR SYNCHROTRON	_____
☐ SEALED SOURCE	_____
☐ UNSEALED RADIOACTIVE MATERIAL	_____
☐ NATURAL ORES OR MILL TAILINGS	_____
☐ OTHER (SPECIFY)_____	_____
	100%

IF YOU DO NOT SHIP RADIOACTIVE WASTES, YOU HAVE COMPLETED THE QUESTIONNAIRE. THANK YOU. IF YOU DO SHIP, PLEASE CONTINUE WITH THE FOLLOWING QUESTIONS.

PART IV - PHYSICAL FORM OF SHIPPED WASTES

(CHECK EACH FORM OF WASTE WHICH YOU SHIP AND INDICATE THE PERCENTAGE OF YOUR TOTAL SHIPPED WASTE VOLUME REPRESENTING EACH FORM)

	PERCENT OF WASTE VOLUME SHIPPED
☐ DRY SOLIDS, TRASH, IRRADIATED COMPONENTS	_____
☐ SOLIDIFIED OR ABSORBED LIQUIDS, SOLID SLUDGES, SPENT RESINS, FILTER SLUDGES OR EVAPORATOR BOTTOMS	_____
☐ ANIMAL CARCASSES OR OTHER BIOLOGICAL WASTE	_____
☐ SEALED SOURCES	_____
☐ OTHER (SPECIFY)_____	_____
	100%

DOES WASTE CONTAIN ANY MATERIAL WHICH IS POTENTIALLY:

YES	NO	
☐	☐	COMBUSTIBLE
☐	☐	EXPLOSIVE
☐	☐	CHEMICALLY TOXIC

WHAT SHIPPING CONTAINERS DO YOU USE?

- ☐ 55 GALLON STEEL DRUMS
- ☐ 30 GALLON STEEL DRUMS
- ☐ OTHER (SPECIFY)_____

WHAT ON-SITE PROCESSING OF WASTE DO YOU EMPLOY?

- ☐ NONE
- ☐ MECHANICAL COMPACTION
- ☐ INCINERATION
- ☐ SOLIDIFICATION OR EVAPORATION OF LIQUIDS
- ☐ ABSORPTION OF LIQUIDS
- ☐ OTHER (SPECIFY)_____

FIGURE 5-4 (Concluded)

PART V - WASTE QUANTITY

INDICATE TOTAL YEARLY VOLUME (IN CUBIC FEET) OF WASTE SHIPPED TO A COMMERCIAL DISPOSAL FACILITY.

	CUBIC FEET SHIPPED
ACTUAL SHIPPED IN 1977	_____
ACTUAL SHIPPED IN 1978	_____
ACTUAL SHIPPED IN 1979	_____

INDICATE TOTAL YEARLY VOLUME (IN CUBIC FEET) OF WASTE PROJECTED TO BE GENERATED WHICH WILL BE SHIPPED.

	CUBIC FEET GENERATED
ESTIMATED GENERATION IN 1980	_____
ESTIMATED GENERATION IN 1985	_____
ESTIMATED GENERATION in 1990	_____

INDICATE THE QUANTITY OF RADIOACTIVITY (IN CURIES) SHIPPED TO A COMMERCIAL FACILITY IN THE YEARS 1977, 1978 AND 1979.

	QUANTITY SHIPPED (CURIES) IN:		
ISOTOPE	1977	1978	1979

6.0 USE OF COMMERCIAL LOW-LEVEL WASTE DISPOSAL FACILITIES

In the State of Oregon, a total of 185 potential shippers of low-level radioactive waste were identified. These potential shippers were sent, by direct, mail questionnaires concerning their waste management practices. The respondent was identified as either a medical, educational, industrial, power reactor, or governmental type facility. All but one of the potential shippers identified for the State of Oregon were able to be grouped into one of these classifications of facilities. Section 2.0 presents the number of respondents using various disposal methods and the source of radioactivity used at facilities. Table 2-1 indicates that 18.7 percent (17 facilities) of the respondents use commercial low-level waste facilities. The following subsections present a summary of the characteristics and quantity of wastes disposed of by these 17 facilities.

6.1 RESPONSE TO SURVEY

Table 6-1 presents, by facility type, the number of potential shippers surveyed, the total number and percentage of responses obtained, and a breakdown of responses by degree of response. If a facility provided at least the facility type and method of disposal, the answers were considered a response. If no information was obtained, the type of facility was determined by the facility name, if possible. If not, the type of facility was tabulated as "unknown." The responses were further categorized by degree of response into three groups. Group 1 responses were responses in which all appropriate information requested was provided (see Figure 5-1). Group 2 responses provided only information on the type of facility, disposal method, and quantity of waste. Group 3 responses included only information on the type of facility and the disposal method.

Forty-nine percent of all potential shippers identified provided some degree of response. The percent of response between type of facility ranged from 39.6 percent for medical facilities to 75.0 percent for educational facilities. Of the respondents, 64.1 percent provided all requested information.

It should be noted that of the 94 potential shippers (out of 185) which did not provide any information, many of these may in fact be shippers. A decline to answer the questionnaire can be reasonably assumed to indicate that they in fact do

ship wastes, since the only response and effort required if they do not ship wastes was to return the form. Accordingly, there is a high potential that the percent response to the survey from shippers may be as low as 15 percent (17 shipper respondents out of a total of 112 shippers or nonrespondents) rather than the 49 percent response from all potential shippers.

6.2 SOURCES OF SHIPPED WASTE

6.2.1 Distribution by Type of Facilities Shipping Wastes

Table 6-2 presents the distribution of numbers of facilities shipping wastes by major type of facility and by subgroup within each major type. In terms of number of facilities shipping wastes, medical facilities account for over 47 percent of all shippers, with educational facilities comprising 29 percent of all shippers.

6.2.2 Origin of Radioactivity Resulting in Shipped Wastes

The origin of radioactivity resulting in shipped waste was grouped into three categories: nuclear reactor operation, purchased as sealed sources, and purchased as unsealed radioactivity. Table 6-3 presents the distribution of number of facilities shipping wastes according to type of facility and origin of radioactivity. It should be noted that more than one origin may be appropriate for a given facility. Therefore, the total number of origins presented in Table 6-3 is greater than the total number of shippers of low-level waste. Over 88 percent of the facilities shipping waste obtain the radioactivity as unsealed radioactive material.

6.3 VOLUME OF SHIPPED WASTE

Volumes of low-level wastes shipped to commercial disposal facilities were provided by 14 facilities of the 17 respondents that indicated they shipped wastes. These 14 facilities represent 12.5 percent of the 112 potential shippers within the state (17 respondents and 95 non-respondents). Table 6-4 presents volumes of shipped wastes for the years 1976, 1977, and 1978 for each type of facility.

The one operating power reactor within Oregon (Trojan station) generated the majority of waste volume, accounting for about 44 percent of all shipped waste in 1976, 61 percent in 1977, and 72 percent in 1978. This reactor started operating in May 1976. Thus, the 1978 data are most representative of current shipments.

Table 6-5 shows the number of facilities that expect to increase, decrease, or not change the volume of shipped waste. These data indicate that a small increase with time might be expected, continuing the trend shown in the 1976, 1977, and 1978 data.

Two additional power reactors (Pebble Springs 1 and 2) are scheduled to become operational in 1988 and 1990, respectively. Their operation would approximately triple the total waste volume generated within Oregon.

6.4 ACTIVITY OF SHIPPED WASTE

Table 6-6 presents quantity of activity in the waste shipped for the years 1976, 1977, and 1978 for each type of facility. As with the volumes shipped, power reactors accounted for the vast majority of activity shipped, being as high as 99.2 percent in 1978. However, in 1977, the University of Oregon disposed of 2,200 curies of Cobalt-60, which is expected to be an infrequent occurrence. This one shipment represents 96.4 percent of the total activity disposed of from Oregon in 1977. Table 6-7 presents the distribution by radionuclides of activity shipped.

6.5 PHYSICAL CHARACTERISTICS OF SHIPPED WASTE

Onsite processing of low-level waste may be performed to either reduce the volume of the waste (compaction, incineration) or to remove free liquid (solidification, evaporation, absorption). Table 6-8 shows the number of facilities using these methods. Only one of the 11 respondents indicated they used mechanical compaction or incineration for volume reduction. Over half of the facilities use absorption to handle free liquids.

Table 6-9 presents the type of shipping container used onsite to package waste for transport to disposal facilities. Most facilities use either 55-gallon or 30-

gallon steel drums. However, about 29 percent of the facilities (shown under "other" column) use simply cardboard boxes for small volumes of waste which are packaged in drums by the transporter.

Shipped waste was categorized as either dry, moist, biological, sealed, or other. Table 6-10 presents the number of facilities shipping waste in any of these categories.

TABLE 6-1

RESPONSE TO DIRECT MAIL SURVEY

Type of facility	Number of licensees	Number of respondents	Percent response	Degree of Response								
				Group 1			Group 2			Group 3		
				Number	Percent of licensees	Percent of respondents	Number	Percent of licensees	Percent of respondents	Number	Percent of licensees	Percent of respondents
Medical	53	21	39.6	14	7.6	15.4	6	3.2	6.6	1	0.5	1.1
Educational	16	12	75.0	8	4.3	8.8	2	1.1	2.2	2	1.1	2.2
Industrial	86	42	48.8	27	14.6	29.7	15	8.1	16.5	0	0.0	0.0
Power Reactor	1	1	100.0	1	0.5	1.1	0	0.0	0.0	0	0.0	0.0
Governmental	28	15	53.6	9	4.9	9.9	5	2.7	5.5	1	0.5	1.1
Unknown	1	-	-	-	-	-	-	-	-	-	-	-
TOTAL	185	91	49.2	59	31.9	64.1	28	15.1	30.8	4	2.2	44

TABLE 6-2

TYPE OF FACILITIES SHIPPING LOW-LEVEL WASTE

Type of Facility		Number of facilities shipping	Percent of all shippers	Percent of facilities type
Facility	Subgroup			
Medical	Hospital	3	17.6	37.5
	Pharmaceutical	0	0.0	0.0
	Research/Education	1	5.0	12.5
	Other	4	23.5	50.0
	Total	8	47.1	100.0
Educational	University	5	29.4	100.0
	High School	0	0.0	0.0
	Other	0	0.0	0.0
	Total	5	29.4	100.0
Industrial	Product Use	0	0.0	0.0
	Process Control	1	5.9	100.0
	Other	0	0.0	0.0
	Total	1	5.9	100.0
Power Reactor	Total	1	5.9	100.0
Governmental	Federal	1	5.9	50.0
	Military	0	0.0	0.0
	State	0	0.0	0.0
	Local	1	5.9	50.0
	Total	2	11.8	100.0
TOTAL		17	100.0	100.0

TABLE 6-3

ORIGIN OF RADIOACTIVITY RESULTING IN SHIPPED WASTES

Type of facility	Number of respon-dents	Nuclear reactor		Sealed sources		Unsealed radioactive material	
		Number of sources*	Percent of all shippers	Number of sources*	Percent of all shippers	Number of sources*	Percent of all shippers
Medical	8	0	0.0	0	0.0	8	47.1
Educational	5	0	0.0	0	0.0	5	29.4
Industrial	1	0	0.0	1	5.9	0	0.0
Power Reactor	1	0	0.0	0	0.0	0	0.0
Governmental	2	1	5.9	0	0.0	2	11.8
TOTAL	17	1	5.9	1	5.9	15	88.2

*The total of "number of sources" exceeds the total number of respondents due due to facilities generating waste from several sources.

TABLE 6-4

VOLUME OF SHIPPED WASTE

Type of Facility	Number of respondents	Volume Shipped					
		1976		1977		1978	
		Cubic meters	Percent of total	Cubic meters	Percent of total	Cubic meters	Percent of total
Medical	7	46.3	47.7	54.6	32.8	59.2	18.9
Educational	4	1.3	1.4	0.9	0.5	20.5	6.6
Industrial	1	0	0.0	0	0.0	1.0	0.3
Power Reactor	1	43.7	45.1	101.4	60.9	225.9	72.3
Governmental	1	5.6	5.8	9.6	5.7	6.0	1.9
TOTAL	14	96.9	100.0	166.5	100.0	312.5	100.0

TABLE 6-5

PROJECTED CHANGE IN VOLUME OF SHIPPED WASTE

Type of Facility	Number of respon-dents	Projected Change in Volume					
		Increase		No Change		Decrease	
		Number of facilities	Percent of total respon-dents	Number of facilities	Percent of total respon-dents	Number of facilities	Percent of total respon-dents
Medical	8	4	28.6	2	14.3	2	14.3
Educational	4	4	28.6	0	0.0	0	0.0
Industrial	1	0	0.0	1	7.1	0	0.0
Power Reactor	0	-	-	-	-	-	-
Governmental	1	0	0.0	1	7.1	0	0.0
TOTAL	14	8	57.2	4	28.5	2	14.3

TABLE 6-6

ACTIVITY OF SHIPPED WASTE

Type of Facility	Number of respon-dents	Activity Shipped					
		1976		1977		1978	
		Curies	Percent of total	Curies	Percent of total	Curies	Percent of total
Medical	7	5.0E-1	6.9	5.5E-1	0.0	5.7E-1	0.1
Educational	4	4.7E-1	6.5	2.2E+3	96.4	1.2E+0	0.3
Industrial	1	0.0	0.0	0.0	0.0	1.25E-3	0.0
Power Reactor	1	6.2E+0	86.6	8.4E+1	3.6	4.5E+2	99.2
Governmental	1	8.8E-4	0.0	2.3E-3	0.0	2.0E+0	.4
TOTAL	14	7.2E+0	100.0	2.3E+3	100.0	4.5E+2	100.0

Table 6-7

RADIONUCLIDES IN SHIPPED WASTES

Isotope	Activity (curies)																	
	Total			Medical			Educational			Industrial			Power Reactors			Governmental		
	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978	1976	1977	1978
H-3	2.3E-1	6.2E-1	2.4E-1	1.0E-2	1.0E-2	1.0E-2	2.2E-1	4.1E-1	4.0E-1	0.0	0.0	2.5E-4	0.0	0.0	0.0	6.0E-4	0.0	2.0E+0
C-14	1.4E-2	1.2E-2	3.1E-2	5.0E-5	5.0E-5	5.0E-5	1.3E-2	9.6E-3	3.1E-2	0.0	0.0	0.0	0.0	0.0	0.0	2.8E-4	2.3E-3	6.8E-4
Na-22	3.5E-4	4.0E-5	1.1E-5	0.0	0.0	0.0	3.5E-4	4.0E-5	1.1E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P-32	3.3E-3	3.0E-4	1.9E-1	0.0	0.0	0.0	3.3E-3	3.0E-4	1.9E-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
S-35	3.1E-2	3.8E-2	5.8E-2	0.0	0.0	0.0	3.1E-2	3.8E-2	5.8E-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl-36	9.5E-4	1.0E-4	5.5E-4	0.0	0.0	0.0	9.5E-4	1.0E-4	5.5E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ca-45	1.8E-4	0.0	5.0E-6	0.0	0.0	0.0	1.8E-4	0.0	5.0E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ga-67	5.0E-5	5.0E-5	5.0E-5	5.0E-5	5.0E-5	5.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cr-51	2.2E-2	4.0E-5	6.0E-2	3.0E-5	3.0E-5	3.0E-5	2.2E-2	1.0E-5	6.0E-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mn-54	0.0	0.0	6.0E+1	0.0	0.0	0.0	0.0	0.0	1.0E-6	0.0	0.0	0.0	0.0	0.0	6.0E+0	0.0	0.0	0.0
Fe-59	0.0	0.0	2.1E-4	0.0	0.0	0.0	0.0	0.0	2.1E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Co-57	8.0E-5	2.0E-4	3.2E-5	6.0E-5	1.4E-4	2.2E-5	2.0E-5	6.0E-5	1.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Co-58	6.0E+0	7.9E+1	3.9E+2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0E+0	7.9E+1	3.9E+2	0.0	0.0	0.0
Co-60	2.0E-1	2.2E+3	5.3E+1	0.0	0.0	0.0	0.0	2.2E+3	0.0	0.0	0.0	0.0	2.0E-1	4.9E+0	5.3E+1	0.0	0.0	0.0
Zn-65	0.0	0.0	1.0E-5	0.0	0.0	0.0	0.0	0.0	1.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Se-75	1.5E-3	1.0E-3	2.1E-4	0.0	0.0	0.0	1.5E-3	1.0E-3	2.1E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Br-82	0.0	0.0	1.5E-2	0.0	0.0	0.0	0.0	0.0	1.5E-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kr-85	0.0	0.0	1.5E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5E-4	0.0	0.0	0.0	0.0	0.0	0.0
Rb-86	0.0	9.0E-3	4.0E-3	0.0	0.0	0.0	0.0	9.0E-3	4.0E-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sr-85	2.0E-4	1.3E-3	2.5E-3	0.0	0.0	0.0	2.0E-4	1.3E-3	2.5E-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tc-99m	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	1.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD-109	0.0	0.0	1.8E-3	0.0	0.0	0.0	0.0	0.0	1.8E-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I-125	4.0E-1	4.8E-1	5.5E-1	3.1E-1	3.3E-1	3.5E-1	1.0E-1	1.5E-1	2.0E-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I-131	5.7E-3	4.1E-4	2.1E-4	2.0E-4	2.0E-4	2.0E-4	5.5E-3	2.1E-4	1.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cs-137	0.0	0.0	8.6E-4	0.0	0.0	0.0	0.0	0.0	1.0E-5	0.0	0.0	8.5E-4	0.0	0.0	0.0	0.0	0.0	0.0
Ce-141	1.7E-4	4.2E-4	4.7E-4	0.0	0.0	0.0	1.7E-4	4.2E-4	4.7E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yb-169	5.0E-5	5.0E-5	5.0E-5	5.0E-5	5.0E-5	5.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ir-192	0.0	0.0	7.7E-2	0.0	0.0	0.0	0.0	0.0	7.7E-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Au-195	2.0E-4	0.0	0.0	0.0	0.0	0.0	2.0E-4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Po-214	0.0	0.0	1.5E-6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5E-6
Ra-226	0.0	0.0	1.0E-1	0.0	0.0	1.0E-1	0.0	0.0	2.0E-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixtures	1.8E-1	2.1E-1	3.1E-1	1.8E-1	2.1E-1	3.1E-1	0.0	0.0	2.0E-1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	7.2E+0	2.3E+1	4.5E+2	5.0E-1	5.5E-1	5.7E-1	4.7E-1	2.2E+1	1.2E+0	0.0	0.0	1.3E+0	6.2E+0	8.8E+1	4.5E+2	8.8E-4	2.3E-2	2.0E+0

TABLE 6-8

ONSITE PROCESSING OF SHIPPED WASTE

Type of Facility	Number of respondents	None		Mechanical Compaction		Solidification/ Evaporation		Absorption	
		Number* using	Percent of total respon-dents	Number* using	Percent of total respon-dents	Number* using	Percent of total respon-dents	Number* using	Percent of total respon-dents
Medical	4	1	9.1	0	0.0	0	0.0	3	27.3
Educational	5	0	0.0	0	0.0	2	18.2	3	27.2
Industrial	0	0	0.0	0	0.0	0	0.0	0	0.0
Power Reactor	1	0	0.0	1	9.1	1	9.1	0	0.0
Governmental	1	0	0.0	0	0.0	0	0.0	1	9.1
TOTAL	11	1	9.1	1	9.1	3	27.3	7	63.6

*The total of "number using" exceeds the total number of respondents due to the use of several practices at each facility.

TABLE 6-9

SHIPPING CONTAINER USED

Type of Facility	Number of respon-dents	55-gal. drums		30-gal. drums		Others	
		Number* using	Percent of total respon-dents	Number* using	Percent of total respon-dents	Number* using	Percent of total respon-dents
Medical	6	4	28.6	2	14.3	1	7.1
Educational	5	4	28.6	1	7.1	2	14.3
Industrial	1	0	0.0	0	0.0	1	7.1
Power Reactor	1	1	7.1	0	0.0	0	0.0
Governmental	1	1	7.1	0	0.0	0	0.0
TOTAL	14	10	71.4	3	21.4	4	28.6

*The total of "number using" exceeds the total number of respondents due to several types of containers being used at some facilities.

TABLE 6-10

PHYSICAL FORM OF SHIPPED WASTE

Type of facility	Number of respondents	Dry		Moist/potential free liquid		Biological waste		Sealed sources	
		Number of facilities	Percert of total respon-dents	Number of facilities	Percent of total respon-dents	Number of facilities	Percent of total respon-dents	Number of facilities	Percent of total respon-dents
Medical	8	7	41.2	3	17.6	0	0.0	0	0.0
Educational	5	4	23.5	5	29.4	1	5.9	0	0.0
Industrial	1	0	0.0	0	0.0	0	0.0	1	5.9
Power Reactor	1	1	5.9	1	5.9	0	0.0	0	0.0
Governmental	2	1	5.9	1	5.9	0	0.0	0	0.0
TOTAL	17	13	76.5	10	58.8	1	5.9	1	5.9

*The total of "number of facilities" exceeds the total number of respondents due to waste being in several forms at some facilities.

APPENDIX A

RADIOACTIVE MATERIAL LICENSEES IN THE STATE OF OREGON

EXPLANATION OF LIST OF LICENSEES

Column 1: Name and address as provided by the Idaho Department of Health and Welfare

Column 2: N indicates questionnaire was not delivered as evidenced by package being returned by postal service

Y indicates questionnaire was mailed and not returned by the Postal Service

Column 3: N indicates that no response to the written questionnaire was received

1 indicates the licensee did respond and provided all appropriate information

2 indicates the licensee did respond but provided only information on type of facility, disposal method, and quantity of waste

3 indicates the licensee did respond but provided only information on type of facility and disposal method

Column 4:
M = Medical
E = Educational
I = Industrial
P = Power Reactor
G = Governmental
U = Unknown

Column 5: Y indicates the licensee ships wastes to a commercial disposal site

N indicates the licensee does not ship wastes

- indicates information not available

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Acme Trading & Supply Company Attn: Alan H. Selker 4927 N.W. Front Avenue Portland, OR 97210	Y	N	I	-	
Albany General Hospital Attn: R. Delano 1046 W. 6th Street Albany, OR 97321	Y	N	M	-	
American Red Cross Blood Services Attn: F. Peetoom, M.D. 4200 S.W. Corbett, P.O. Box 70 Portland, OR 97207	Y	1	M	Y	
Anderson-Perry & Associates, Inc. Attn: Howard L. Perry P.O. Box 1107 La Grande, OR 97850	Y	1	I	N	No waste.
Ash Grove Cement Company Attn: W. A. Kistler P.O. Box 03007 Portland, OR 97203	Y	N	I	-	
Babler Bros., Inc. Attn: Curtis Boardman 4617 S.E. Milwaukee Avenue Portland, OR 97202	Y	N	I	-	
Bay Area Hospital Attn: J. B. Shininger, M.D. 1775 Thompson Road Coos Bay, OR 97420	Y	N	M	-	
Bear Creek Valley San Auth. Attn: Melvin D. Freeman 3915 S. Pacific Highway Medford, OR 97501	Y	N	G	-	
Bend Research Inc. Attn: R. W. Baker 64550 Research Road Bend, OR 97701	Y	1	I	N	
Bend-Willamette Corporation Attn: Wanda Marling, Business Mgr. P.O. Box 1265 Bend, OR 97701	Y	1	I	N	No waste.
Bingham Willamette Company Attn: Olaf Rove 2800 N.W. Front Avenue Portland, OR 97210	Y	1	I	N	
Boise Cascade Corporation Attn: Homer Brock St. Helens Division St. Helens, OR 97051	Y	1	I	N	No waste.
Boise-Cascade/Paper Group Attn: David Ward P.O. Box 14201 Salem, OR 97309	Y	1	I	N	No waste.
John D. Boyett, M.D. 9450 S.W. Barnes Road Portland, OR 97225	Y	N	M	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Brooks-Scanlon, Inc. Attn: David Miller P.O. Box 1111 Bend, OR 97701	Y	1	I	N	No waste.
Ian A. Brown, M.D., P.C. Grant Building Suite A 9370 S.W. Greenburg Road Portland, OR 97223	Y	N	M	-	
Carlson Testing, Inc. Attn: Douglas Leach P.O. Box 23814 Tigard, OR 97223	Y	N	I	-	
Cascade Construction Company, Inc. Attn: Brian J. Klaiber P.O. Box 4267 Portland, OR 97208	Y	N	I	-	
Cascade Steel Rolling Mills Attn: Bill Brantly 3200 N. Highway McMinnville, OR 97128	Y	1	I	N	No waste.
Century Testing Laboratories Attn: Dave Newton P.O.Box 1174 Bend, OR 97701	Y	N	I	-	
Century West Engineering Attn: Rainse E. Anderson P.O. Box 1174 Bend, OR 97701	Y	1	I	N	
Champion Building Products Attn: Don Judd 4780 Dee Highway Hood River, OR 97031	Y	N	I	-	
Chinook Research Labs, Inc. Attn: Russell Korvola P.O. Box 1392 Corvallis, OR 97330	Y	N	I	-	
James S. Christian 14820 N.W. Ridgetop Court Beaverton,OR 97005	Y	N	U	-	
Wastewater Treatment Plant 408 N.E. Waverly Drive Albany, OR 97321	Y	1	G	N	No waste.
City of Corvallis Eng. Division Attn: A. Gordon Wyatt 501 S.W. Madison Avenue Corvallis, OR 97330	Y	1	G	N	
City of Grants Pass Attn: Harry W. Chester 101 N.W. A Street Grants Pass, OR 97526	Y	1	G	N	
City of Gresham Attn: Stan Van Der Zanden 150 W. Powell Gresham, OR 97030	Y	N	G	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
City of Hillsboro Eng. Dept. Attn: Gilbert Rodriguez 205 S.E. Second Avenue Hillsboro, OR 97123	Y	N	G	-	
City of Medford Attn: Don Walker City Hall Medford, OR 97501	Y	N	G	-	
Water Bureau Water Quality Control Laboratory 10991 SE Lusted Road Portland, OR 97055	Y	3	G	Y	
Water Pollution Control Laboratory 5001 N. Col. Blvd. Portland, OR 97203	Y	1	G	N	No waste.
City of Salem, Dept. Public Works Attn: John A. Hinsley Civic Center - 555 Liberty Salem, OR 97301	Y	1	G	N	No waste.
City of Portland Dept. Public Works Attn: Cowles Mallory 400 S.W. 6th #310 Portland, OR 97204	Y	N	G	-	
Columbia Helicopters, Inc. Attn: Steve Martin P.O. Box 3500 Portland, OR 97208	Y	1	I	N	No waste.
Columbia Laboratories, Inc. Attn: Colin Campbell, PhD P.O. Box 40 Corbett, OR 97019	Y	N	M	-	
Columbia Memorial Hospital Attn: E. W. Blomquist 2111 Exchange Street Astoria, OR 97103	Y	N	M	-	
J. C. Compton Company Attn: Emerson B. Page P.O. Box 86 McMinnville, OR 97128	Y	N	I	-	
Corvallis Clinic Attn: David Kliewer, M.D. 3680 N.W. Samaritan Drive Corvallis, OR 97330	Y	1	M	N	
Crown Zellerbach Attn: S. Sandifer West Linn Division West Linn, OR 97068	Y	N	I	-	
Crown ZellerbachCorporation Attn: W. Carlson Wauna Division Clatskanie, OR 97016	Y	1	I	N	
Crown Zellerbach Flex Pkg. Attn: Douglas Meyers P.O. Box 17128 Portland, OR 97217	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Dames & Moore Attn: Randolph S. Jarigese 1220 S.W. Morrison Portland, OR 97205	Y	N	I	-	
Gilmore Steel Direct Reduction Division Attn: R. Brener 14141 N. Rivergate Blvd. Portland, OR 97203	Y	1	I	N	No waste.
Douglas County Dept. Public Works Attn: James F. Gosson Room 103, Justice Hall Roseburg, OR 97470	Y	1	G	N	No waste.
Douglas Community Hospital Attn: Victor J. Vlk, M.D. 738 W. Harvard Blvd. Roseburg, OR 97470	Y	N	M	-	
Duraflake Company Attn: Ray Barr P.O. Box 428 Albany, OR 97321	Y	1	I	N	
Dwyer Memorial Hospital Attn: Stuart Rosenthal, M.D. 10150 S.E. 32nd Avenue Milwaukie, OR 97222	Y	N	M	-	
Eastern Oregon State College Attn: Gerald E. Young Lagrande, OR 97850	Y	1	E	N	
Eastmoreland General Hospital Attn: Roger Zumwalt, Admin. 2900 S.E. Steele Street Portland, OR 97202	Y	N	M	-	
Emanuel Hospital Attn: N.A. Pickering, M.D. 2801 N. Gantenbein Avenue Portland, OR 97227	Y	N	M	-	
ESCO Corporation Attn: Larry Buzan 2141 N.W. 25th Avenue Portland, OR 97210	Y	N	I	-	
Eugene Hospital-Clinic Attn: F. L. Benoit, M.D. 1162 Willamette Street Eugene, OR 97401	Y	N	M	-	
Evans Products Company, Glass Plant Attn: Mike Long 1551 S.E. Crystal Lake Drive Corvallis, OR 97330	Y	1	I	N	
Mathews B. Fish, M.D. P.O. Box 369 Eugene, OR 97401	Y	1	M	N	Same as Sacred Heart General Hospital.
Flightcraft, Inc. Attn: Alan F. Roberts 7505 N.E. Airport Way Portland, OR 97218	Y	1	I	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Forest Fiber Products Company Attn: Earl E. Meyer P.O. Box 68 Forest Grove, OR 97116	Y	1	I	N	No waste.
V. H. Gehling, M.D. 1100 Southgate Pendleton, OR 97801	Y	N	M	-	
General Electric Company Attn: M. A. Esposito 3259 N.W. 29th Avenue Portland, OR 97210	Y	1	I	N	
Georgia Pacific Corporation Attn: Kent L. Hall P.O. Box 580 Toledo, OR 97391	Y	N	I	-	
Georgia Pacific Corporation Attn: L. C. Noyd Hardboard Plant, P.O. Box 869 Coos Bay, OR 97420	Y	1	I	N	
Good Samaritan Hospital Attn: Gary F. Gates, M.D. 1015 N.W. 22nd Avenue Portland, OR 97210	Y	N	M	-	
Good Samaritan Hospital Attn: Gary McCormack 3600 N.W. Samaritan Drive Corvallis, OR 97330	Y	N	M	-	
Gourmet Food Products, Inc. Attn: Don Nordmeyer P.O. Box 37 Boardman, OR 97818	Y	N	I	-	
Grande Ronde Hospital Attn: Donald R. McFarlane, M.D. 900 Sunset Drive La Grande, OR 97850	Y	1	M	N	
Gresham Community Hospital Attn: Terry Mack, Admin. 5th & Beech Streets Gresham, OR 97030	Y	1	M	N	No waste.
Halsey Pulp Company Attn: Alfred G. Webb P.O. Box 215 Halsey, OR 97348	Y	N	I	-	
Hanley Engineering Attn: James D. Hanley P.O. Box 701 Baker, OR 97814	Y	N	I	-	
Hanna Nickel Smelting Company Attn: E. J. Soderberg P.O. Box 85 Riddle, OR 97469	Y	N	I	-	
Health Physics Northwest, Inc. Attn: Ross Mercer P.O. Box 87 West Linn, OR 97068	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
University of Oregon Health Sciences Center Attn: D. G. Kassebaum, M.D. 3181 S.W. Sam Jackson Park Road Portland, OR 97201	Y	3	E	Y	
Hewlett-Packard Attn: John L. Brewster 1700 S. Baker Street McMinnville, OR 97128	Y	1	I	N	
Hill, Inc. Attn: Larry W. Well P.O. Box 428 Corvallis, OR 97330	Y	N	I	-	
Holladay Park Hospital Attn: Stuart Rosenthal, M.D. 1225 N.E. 2nd Avenue Portland, OR 97232	Y	N	M	-	
Holy Rosary Hospital Attn: W. M. Tipton, M.D. 351 S.W. 9th Street Beaverton, OR 97005	Y	N	M	-	
Hyman-Hyman-Horowitz, M.D.'s 2311 N.W. Northrup Street Portland, OR 97210	Y	N	M	-	
ICN Medical Labs, Inc. Attn: Velda Schossler P.O. Box 3932 Portland, OR 97208	Y	1	M	Y	
Industrial Inspection Inc. Attn: D. Wayne Lawton 0511 S.W. Carolina Street Portland, OR 97201	Y	1	I	N	
Intel Corporation Attn: Theodore J. Portello 3585 S.W. 198th Avenue Portland, OR 97207	Y	1	I	N	
International Paper Company Attn: W. L. Wilson P.O. Box 854 Gardiner, OR 97441	Y	1	I	N	
Interpath Lab PC 1100 Southgate Pendleton, OR 97801	Y	N	M	-	
Jackson County Dept. Public Works Attn: William J. Gaddis 200 Antelope Road White City, OR 97501	Y	N	G	-	
Jefferson State Engineering Attn: David A. Hammond 5900 Washburn Way Klamath Falls, OR 97601	Y	1	I	N	
Jeld-Wen Inc. Attn: William Early P.O. Box1329 Klamath Falls, OR 97601	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Josephine General Hospital Attn: Jon Gove, M.D. 715 N.W. Dimick Grants Pass, OR 97526	Y	1	M	N	
Kaiser Foundation Hospital Attn: Daniel M. Baer, M.D. 5055 N. Greeley Avenue Portland, OR 97217	Y	1	M	N	
LaGrand Industrial Supply Attn: Louis La Grand P.O. Box 8053 Portland, OR 97201	Y	1	I	N	Resale only.
Lamb-Weston Division of AMFAC Foods, Inc. P.O. Box 705 Hermiston, OR 97838	Y	N	I	-	
Lamb-Weston, Inc. Attn: G. B. Jacobsen 6600 S.W. Hampton Street Portland, OR 97723	Y	N	I	-	
Metpath Attn: Siegfried Heller 3324 N.E. Sand Blvd. Portland, OR 97220	Y	1	M	N	No longer have any sources.
Lane Co. Dept. Public Works Attn: James Jeppesen, Jr. 3040 N. Delta Highway Eugene, OR 97401	Y	1	G	N	
Lane Co. Environmental Health Attn: Richard A. Kirby 125 East 8th Avenue Eugene, OR 97401	Y	1	G	N	
Lewis & Clark College Attn: James H. Karle 0615 S.W. Palatine Hill Road Portland, OR 97219	Y	1	E	N	
Linfield College Attn: Robert Jones McMinnville, OR 97128	Y	1	E	N	
Linn-Benton Community College Attn: Dr. Peter C. Scott 6500 S.W. Pacific Blvd. Albany, OR 97320	Y	1	E	N	
Linn County Engineer Attn: Neal Michael 3010 Ferry Street Albany, OR 97321	Y	N	G	-	
LittonGuidance & Control Systems Division Attn: Eldon J. Luick 1001 Redwood Highway Spur Grants Pass, OR 97526	Y	N	I	-	
McKenzie-Willamette Hospital Attn: Leslie Dos Reis, M.D. 1460 G Street Springfield, OR 97477	Y	N	M	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Medford Corporation Attn: Matthew D. Reilly P.O. Box 550 Medford, OR 97501	Y	1	I	N	No waste.
Menasha Corp.-Paperboard Div. Attn: T. F. Williscroft Jordan Point North Bend, OR 97459	Y	N	I	-	
Mercy Medical Center, Inc. Attn: Sister Jacquette Taylor 2700 Steward Parkway Roseburg, OR 97470	Y	N	M	-	
Metropolitan Hospitals Attn: Ruger Larson 2800 Vancouver Avenue, Suite 235 Portland, OR 97227	Y	1	M	Y	
Mogul Corporation Attn: Lee Henry 2852 N.W. 31st Avenue Portland, OR 97210	Y	N	I	-	
Multnomah County, Div. of Operations & Maintenance Attn: Tor Lyshaug 9659 N.E. Hancock Drive Portland, OR 97220	Y	1	G	N	
National Mechanical Data Company Attn: John Restango 8058 S.W. Nimbus Avenue Beaverton, OR 97005	N	N	I	-	No such address.
Neptune Micofloc, Inc. Attn: Robert M. Guptill 1965 Airport Road Corvallis, OR 97330	Y	1	I	N	
Nerco, Inc. Attn: Philip Bailie 529 S.W. Third Avenue Portland, OR 97204	Y	1	I	N	
G. R. Nicholson, M.D. 2865 Daggett Street Klamath Falls, OR 97601	Y	N	M	-	
North Pacific Products Company Attn: C. H. Cleveland North Century Drive Bend, OR 97701	Y	1	I	N	No waste.
Northwest Natural Gas Company Attn: W. T. Amies 123 N.W. Flanders Street Portland, OR 97209	Y	1	I	N	
Northwest Testing Labs Attn: Paul Irish 4115 N. Mississippi Portland, OR 97217	Y	N	I	-	
Oregon Graduate Center Attn: J. Richard Kerr 19600 N.W. Walker Road Beaverton, OR 97005	Y	1	E	Y	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Oregon Institute Of Technology Attn: James Gerhardt Oretech Branch Post Office Klamath Falls, OR 97601	Y	1	E	N	Have H-3 targets and some sources they would like to get rid of - method not specified.
Oregon Museum of Science-Industry Attn: Clint Gruber 4015 S.W. Canyon Road Portland, OR 97221	Y	N	E	-	
Oregon Portland Cement Company Attn: Alan Howk P.O. Box 189 Lake Oswego, OR 97034	Y	1	I	N	
Oregon Potato Attn: Doug Beerman P.O. Box 169 Boardman, OR 97818	Y	N	I	-	
Oregon Regional Primate Research Center Attn: C. H. Beatty, Ph.D. 505 N.W. 185th Avenue Beaverton, OR 97005	Y	1	M	Y	
Oregon State Department of Agriculture Attn: H. M. Wehr, Lab Administrator 635 Capitol Street, N.E. Salem, OR 97310	Y	1	G	N	
Oregon State Dept. of Env. Qual. Attn: Warren Westgarth P.O. Box 1760 Portland, OR 97207	Y	N	G	-	
Oregon State Highway Division Attn: M.D. Glenn Transportation Building Salem, OR 97310	Y	N	G	-	
Oregon State University Attn: Chairman Rad Safety Comwaldo Hall Room 120 Corvallis, OR 97331	Y	1	E	Y	
Oregon Steel Mills Attn: Wesley A. Tevik P.O. Box 2760 Portland, OR 97208	Y	N	I	-	
Oregon Workers' Comp. Dept. Attn: Martin Jurgenson 204 Labor & Industries Blvd. Salem, OR 97310	Y	N	G	-	
OSHD-Radiation Control Section Attn: M.W. Parrott 140 S.W. 5th Avenue Portland, OR 97201	Y	N	G	-	
Owens-Illinois, Inc. Attn: K. H. Lemke P.O. Box 20067 Portland, OR 97220	Y	N	I	-	
Pacific Medical Imaging Attn: Edgar E. Clark, M.D. Tillamook County General Hospital Tillamook, OR 97141	Y	1	M	N	No waste.

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Pathologists Central Lab Attn: Gary W. Hibler 220 N.E. Russell Street Portland, OR 97212	Y	1	M	Y	
PCL-RIA Attn: Gary W. Hibler 220 N.E. Russell Street Portland, OR 97212	Y	1	M	Y	
Pharma-Med Nuclear, Inc. Attn: Ronald C. Arellano 519 N.W. 21st Avenue Portland, OR 97209	Y	N	M	-	
Physicians & Surgeons Hospital Attn: E. M. Schneider, M.D. 1927 N.W. Lovejoy Street Portland, OR 97209	Y	N	M	-	
Portland Adventist Medical Center Attn: Jeffrey Stevens, M.D. 10123 S.E. Market Street Portland, OR 97216	Y	N	M	-	
Trojan Nuclear Plant P.O. Box 439 Rainier, OR 97048	Y	1	P	Y	
Portland State University Attn: Rudi Nussbaum P.O. Box 751 Portland, OR 97207	Y	2	E	Y	
Port of Portland Attn: Terry N. Craven P.O. Box 3529 Portland, OR 97208	Y	1	G	N	
Precision Castparts Corporation Attn: E. H. Cooley 4600 S.E. Harney Drive Portland, OR 97206	Y	N	I	-	
Providence Hospital Attn: D. A. Turcke, M.D. 1111 Crater Lake Avenue Medford, OR 97501	Y	N	M	-	
Providence Medical Center Attn: Franklin Curl, M.D. 700 N.E. 47th Portland, OR 97213	Y	1	M	Y	
Publishers Paper Company Attn: Ants Eert 419 Main Street Oregon City, OR 97045	Y	1	I	N	
Publishers Paper Company Attn: Ralph Koozer P.O. Box 70 Newberg, OR 97132	Y	1	I	N	No waste.
Q C Inspection Company Attn: M. L. Vannier P.O. Box 141 Clackamas, OR 97015	Y	N	I	-	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Radiation Physics Services Attn: R. H. Sudmann P. O. Box 3510 Astoria, OR 97103	N	N	I	-	No such address.
Reinhold A. Rasmussen, Ph.D. 19600 N.W. Walker Road Beaverton, OR 97005	Y	N	M	-	
Reed College Attn: L. B. Church 3203 S.E. Woodstock Blvd. Portland, OR 97202	Y	N	E	-	
Reichhold Chemicals, Inc. Attn: Harold Nelson P.O. Box 810 St. Helens, OR 97051	Y	1	I	N	
Rittenhouse-Zeman & Associates Attn: Gary Rittenhouse P.O. Box 1127 Beaverton, OR 97005	Y	N	I	-	
Rogue Valley Memorial Hospital Attn: Donald A. Turcke, M.D. 2825 Barnett Road Medford, OR 97501	Y	N	M	-	
Roseburg Lumber Company Attn: Alan Fisher P.O. Box 1088 Roseberg, OR 97470	Y	N	I	-	
Roseburg Lumber Company Attn: J. E. Snodgrass P.O. Box 1088 Roseburg, OR 97470	Y	N	I	-	
Sabre Farms, Inc. Attn: Terrel R. Tovey P.O. Box 320 Boardman, OR 97818	Y	N	I	-	
Sacred Heart General Hospital Attn: Mathews Fish, M.D. 1200 Alder Street Eugene, OR 97401	Y	1	M	Y	
Salem Hospital Attn: Nuclear Medicine P.O. Box 14001 Salem, OR 97309	Y	1	M	N	
Shannon and Wilson, Inc. Attn: Robert J. Strazer 2255 S.W. Canyon Road Portland, OR 97201	Y	1	I	N	
J. R. Simplot Company Attn: Leroy Clemons P.O. Box J Hermiston, OR 97838	Y	1	I	N	
Soils Testing Lab, Inc. Attn: R. S. Blanton 130 W. Nineth Sedford, OR 97501	Y	1	I	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Southern Oregon General Hospital Attn: R. S. Ballantyne, M.D. 1505 N.W. Washington Blvd. Grants Pass, OR 97526	Y	N	M	-	
Southern Oregon State College Attn: J. G. Couch 1250 Siskiyou Blvd. Ashland, OR 97520	Y	N	E	-	
St. Anthony Hospital Attn: Sr. Helen A. Gaidos 1601 S.E. Court Avenue Pendleton, OR 97801	Y	I	M	N	
St. Charles Medical Center Attn: T. J. Muller, M.D. 2500 N.E. Neff Road Bend, OR 97701	Y	N	M	-	
St. Vincent Hospital & Medical Center Attn: Eugene Jackson, M.D. 9205 S.W. Barnes Road Portland, OR 97225	Y	I	M	N	
State of Oregon Military Department Attn: Maj. Gen. Richard Miller 2150 Fairgrounds Road, N.E. Salem, OR 97303	Y	N	G	-	
Tektronix, Inc. Attn: C. A. Schink P.O. Box 500 Beaverton, OR 97077	Y	N	I	-	
The Dallas General Hospital Attn: Gary L. Rood 19th & Nevada Dallas, OR 97058	Y	N	M	-	
The Hanna Mining Co. -Nickel Attn: E. J. Soderberg P.O. Box 85 Riddle, OR 97469	Y	N	I	-	
Tuality Community Hospital Attn: George J. Vennes, M.D. P.O. Box 241 Hillsboro, OR 97123	Y	I	M	N	
Umpqua Research Company Attn: Gerald V. Colombo P.O. Box 791 Myrtle Creek, OR 97457	Y	N	I	-	
Unified Sewerage Agency Attn: Gary Krahmer 150 N. 1st Hillsboro, OR 97123	Y	I	G	N	
University of Oregon Attn: Gordon Goles, Ph.D. P.O. Box 3075 Eugene, OR 97403	Y	N	E	-	
University of Portland Attn: Paul E. Wack 5000 N. Willamette Blvd. Portland, OR 97203	Y	I	E	N	No waste.

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
UOHSC School of Dentistry Attn: Dean C. Gatewood 611 S.W. Campus Drive Portland, OR 97201	Y	1	E	Y	
Washington County Dept. Public Works Attn: William Wise 150 N. First Hillsboro, OR 97123	Y	N	G	-	
Washington County School District Attn: E. C. Springer P.O. Box 200 Beaverton, OR 97005	Y	1	E	N	
Water Analysis & Consulting Attn: Jeff Siegel 304 Blair Blvd Eugene, OR 97401	Y	N	I	-	
Western Kraft Corporation Attn: R. B. Campbell P.O. Box 339 Albany, OR 97321	Y	N	I	-	
Western Professional, Inc. Attn: L. J. Chamberlain 645 9th Street, N.W. Beaverton, OR 97005	Y	1	I	N	
Weyerhaeuser Company Attn: W. R. Cole P.O. Box 389 North Bend, OR 97459	Y	N	I	-	
Weyerhaeuser Company Attn: E. G. Gjertsen P.O. Box 9 Klamath Falls, OR 97601	Y	1	I	N	
Weyerhaeuser Company Attn: Don Kaster P.O. Box 275 Springfield, OR 97477	Y	1	I	Y	
Willamette Falls Comm. Hospital Attn: H. E. Hollowell, Admin. 15th & Division Oregon City, OR 97045	Y	N	M	-	
Willamette-Western Corporation Attn: Robert L. Pyritz P.O. Box 03190 Portland, OR 97203	Y	1	I	N	No waste.
William L. Wales & Assoc. 1740 Austin Street Klamath Falls, OR 97601	Y	1	I	N	
Woodex, Inc. Attn: Norm Norton 34401 Lake Creek Drive Brownsville, OR 97327	Y	1	I	N	
Woodland Park Hospital Attn: R. F. Friedman, M.D. 10300 N.E. Hancock Street Portland, OR 97220	Y	1	M	N	

Licensee Name and Address	Questionnaire		Type of Facility	Ships Waste	Comments
	Delivered	Response			
Paul A. Zipp, M.D. 500 N. Columbia River High Wayst Helens, OR 97051	Y	N	M	-	
OSHD Public Health Laboratory	Y	1	G	N	
U.S. Environmental Protection Agency Pacific NW Water Laboratory Corvallis, OR 97330	Y	1	G	Y	

APPENDIX B

STATE LAWS AND REGULATIONS APPLYING TO RADIOACTIVE WASTE MANAGEMENT IN OREGON

C-Engrossed

Senate Bill 394

Ordered by the House May 7
(Including Amendments by Senate February 26: by Senate, by rules suspension, February 26 and by House May 7)

Sponsored by Senator HALLOCK

SUMMARY

The following summary is not prepared by the sponsors of the measure and is not a part of the body thereof subject to consideration by the Legislative Assembly. It is an editor's brief statement of the essential features of the measure.

Redefines "radioactive waste[.]" and "waste disposal facility." Requires Health Division to [*cause a*] contract for an independent study to be made of public health hazards of radioactive waste and report to next Legislative Assembly. Prohibits establishment, operation or licensing of any radioactive waste disposal facility. Provides that, prior to July 1, 1981, maintenance of radioactive waste deposited prior to March 1, 1979, shall not constitute operation of a waste disposal facility. Specifies that site certificate for waste disposal facilities for uranium mill tailings, mill wastes and mill by-product materia shall not be issued unless certan findings are made. Requires those persons maintaining radioactive wastes deposited prior to March 1, 1979, to pay a proportionate share of the costs necessary for Health Division to carry out the study required by Act. Requires persons desiring to construct or operate a uraium mill or uranium mill tailings disposal facility to file a site certificate application with Energy Facilty Siting Council. Permits council to adopt rules relating to uranium mill and tailings disposal facilities. Permits council to enter into certain agreements with Secretary of Energy. [*each generator of radioactive waste to pay a proportional share of the cost of the Health Division study out of license fees. Prohibits division from granting a license for radioactive waste disposal facility unless specified findings are made.*]

Declares emergency, effective on passage.

A BILL FOR AN ACT

Relating to waste disposal; creating new provisions; amending ORS 469.300, 469.375 and 469.525; and declaring an emergency.

Be It Enacted by the People of the State of Oregon:

Section 1. ORS 469.300 is amended to read:

469.300. As used in ORS 469.300 to 469.570 and 469.992, unless the context requires otherwise:

(1) "Applicant" means any person who makes application for a site certificate in the manner provided in ORS 469.300 to 469.570 and 469.992.

(2) "Application" means a request for approval of a particular site or sites for the construction and operation of an energy facility or the construction and operation of an additional energy facility upon a site for which a certificate has already been issued, filed in accordance with the procedures established pursuant to ORS 469.300 to 469.570 and 469.992.

(3) "Associated transmission lines" means new transmission lines constructed to connect a thermal power plant to the first point of junction of such transmission line or lines with either a power distribution system or an interconnected primary transmission system or both or to the Northwest Power Grid.

(4) "Combustion turbine power plant" means a thermal power plant consisting of one or more fuel-fired combustion turbines and any associated waste heat combined cycle generators.

(5) "Construction" means onsite work and construction, the cost of which exceeds $250,000, excluding exploratory work.

(6) "Council" means the Energy Facility Siting Council established under ORS 469.450.

NOTE: Matter in **bold face** in an amended section is new; matter [*italic and bracketed*] is existing law to be omitted; complete new sections begin with **SECTION.**

(7) "Department" means the Department of Energy created under ORS 469.030.

(8) "Director" means the Director of the Department of Energy.

(9) "Electric utility" means individuals, regulated electrical companies, people's utility districts, joint operating agencies, electric cooperatives, municipalities or any combination thereof, engaged in or authorized to engage in the business of generating, transmitting or distributing electric energy. "Electric utility" includes any person or public agency generating electric energy from an energy facility for its own consumption.

(10) "Energy facility" means any of the following:

(a) An electric power generating plant with a nominal electric generating capacity of more than 25,000 kilowatts, including but not limited to thermal power, hydropower, geothermal power, or combustion turbine power plant.

(b) A nuclear installation as defined in this section.

(c) A high voltage transmission line of more than 10 miles in length with a capacity in excess of 230,000 volts, to be constructed in more than one political subdivision in this state; but excluding lines proposed for construction entirely within 500 feet of an existing corridor occupied by high voltage transmission lines with a capacity in excess of 230,000 volts.

(d) A solar collecting facility using more than 100 acres of land, or providing more than 25,000 kilowatts of power.

(e) A pipeline that is:

(A) Six inches or greater in diameter, and five miles or longer in length, used for the transportation of crude petroleum or a derivative thereof, liquified natural gas, a geothermal energy form or other fossil energy resource.

(B) Sixteen inches or greater in diameter, and five miles or longer in length, used for the transportation of natural or synthetic gas.

(11) "Nuclear installation" means any power reactor; nuclear fuel fabrication plant; nuclear fuel reprocessing plant; waste disposal facility for radioactive waste; and any facility handling that quantity of fissionable materials sufficient to form a critical mass. "Nuclear installation" does not include any such facilities which are part of a thermal power plant.

(12) "Person" means an individual, partnership, joint venture, private or public corporation, association, firm, public service company, political subdivision, municipal corporation, government agency, people's utility district, or any other entity, public or private, however organized.

[*(13) "Radioactive waste" means discarded or unwanted radioactive material, including mined or refined naturally occurring or accelerator produced isotopes and by-product material, source material or special nuclear material as defined by ORS 453.605.*]

(13) (a) "Radioactive waste" means radioactive material which is discarded, unwanted or has no present lawful economic use, including mined or refined naturally occurring isotopes, accelerator produced isotopes and by-product material, source material or special nuclear material as those terms are defined in ORS 453.605. The term does not include those radioactive materials identified in OAR 345-50-020, 345-50-025 and 345-50-035, adopted by the council on December 12, 1978, as presenting no significant danger to the public health and safety.

(b) Notwithstanding paragraph (a) of this subsection, "radioactive waste" does not include uranium mine overburden or uranium mill tailings, mill wastes or mill by-product materials as those terms are defined in Title 42, United States Code, section 2014, on the effective date of this 1979 Act.

(14) "Related or supporting facilities" means any structure adjacent to and associated with an energy facility, including associated transmission lines, reservoirs, intake structures, road and rail access, pipelines, barge basins, office or public buildings, and commercial and industrial structures proposed to be built in connection with the energy facility.

(15) "Site" means any proposed location of an energy facility and related or supporting facilities.

(16) "Site certificate" means the binding agreement between the State of Oregon and the applicant, authorizing the applicant to construct and operate an energy facility on an approved site, incorporating all conditions imposed by the state on the applicant and all warranties given by the applicant to the state.

(17) "Thermal power plant" means an electrical or any other facility using any source of thermal energy with a nominal electric generating capacity of more than 25,000 kilowatts, for generation and distribution of electricity, and associated transmission lines, including but not limited to a nuclear-fueled, geothermal-fueled or fossil-fueled power plant, but not including a portable power plant the principal use of which is to supply power in emergencies.

(18) "Transportation" means the transport within the borders of the State of Oregon of radioactive material destined for or derived from any thermal power plant or nuclear installation, or the delivery of such material to a carrier for transportation.

(19) "Utility" includes:

(a) An individual, a regulated electrical company, a people's utility district, a joint operating agency, an electric cooperative, municipality or any combination thereof, engaged in or authorized to engage in the business of generating, transmitting or distributing electric energy;

(b) A person or public agency generating electric energy from an energy facility for its own consumption; and

(c) A person engaged in this state in the transmission or distribution of natural or synthetic gas.

(20) "Waste disposal facility" means a geographical site in or upon which radioactive waste is held or placed [*for more than seven days*] but does not include a site at which [*the*] radioactive waste [*was*] used or generated pursuant to a license granted under ORS 453.635 [*or*] **is stored temporarily, a site of a thermal power plant used for the temporary storage of radioactive [*material*] waste from that plant for which a site certificate has been issued pursuant to this chapter or a site used for temporary storage of radioactive waste from a reactor operated by a college, university or graduate center for research purposes and not connected to the Northwest Power Grid.**

Section 2. ORS 469.525 is amended to read:

469.525. (1) Notwithstanding any other provision of this chapter, no waste disposal facility for any radioactive [*material*] waste shall be established, operated or licensed within this state.

(2) Prior to July 1, 1981, maintenance of radioactive waste deposited in Oregon prior to March 1, 1979, shall not constitute operation of a waste disposal facility.

Section 3. ORS 469.375 is amended to read:

469.375. The council shall not issue a site certificate for a waste disposal facility for uranium mill tailings, mill wastes and mill by-product material or for radioactive waste or radioactively contaminated containers or receptacles used in the transportation, storage, use or application of radioactive material, unless, accompanying its decision, it finds:

(1) The site is suitable for disposal of such wastes, and the amount thereof, intended for disposal at the site;

(2) It is necessary to dispose of such wastes, and the amount thereof, at the site in Oregon to protect the environment, and the health, safety and welfare of the people of the state from such wastes;

(3) There is no available, economically feasible alternative for disposal of such wastes, and the amount thereof, inside or outside of the state;

(4) The disposal of such wastes, and the amount thereof, at the site will be compatible with the regulatory programs of the Federal Government for disposal of such wastes; and

(5) The disposal of such wastes, and the amount thereof, at the site will be coordinated with the regulatory programs of adjacent states for disposal of such wastes.

SECTION 4. (1) The Health Division shall contract for an independent study of public health hazards associated with storage of the waste described in subsection (13) of ORS 469.300 in this state. The division shall determine:

(a) Whether and to what extent such waste presents a hazard to the health and safety of the people of the State of Oregon; and

(b) What methods are available for disposal of such waste and the relative effectiveness, safety and cost of those methods.

(2) The Health Division shall report its findings to the Sixty-first Legislative Assembly.

SECTION 5. In addition to any other fees required by law, any person who, but for the provisions of subsection (2) of ORS 469.525, would be in violation of subsection (1) of ORS 469.525 shall pay to the Health Division, on or after July 1, 1979, a proportionate share of an assessment of all such persons sufficient to reimburse the division for the cost of the study required by section 4 of this Act.

SECTION 6. Sections 7 to 9 of this Act are added to and made a part of ORS 469.300 to 469.570.

SECTION 7. (1) Any person desiring to construct or operate a uranium mill or uranium mill tailings disposal facility after the effective date of this 1979 Act, shall file with the Energy Facility Siting Council a site certificate application.

(2) The Energy Facility Siting Council shall review an application for a site certificate under this section using the procedure prescribed in ORS 469.350, 469.360, 469.370, 469.375, 469.380, 469.390 and 469.400, for energy facilities. The council is authorized to assess fees in accordance with ORS 469.420 in connection with site certificates applied for or issued under this section.

SECTION 8. The Energy Facility Siting Council shall adopt rules governing the location, construction and operation of uranium mills and uranium mill tailings disposal facilities and the treatment, storage and disposal of uranium mine overburden for the protection of the public health and safety and the environment.

SECTION 9. (1) Notwithstanding the authority of the Health Division pursuant to ORS 453.605 to 453.745 to regulate radiation sources or the requirements of ORS 469.525, the Energy Facility Siting Council may enter into and carry out cooperative agreements with the Secretary of Energy pursuant to Title I and the Nuclear Regulatory Commission pursuant to Title II of the Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, and perform or cause to be performed any and all acts necessary to be performed by the state, including the acquisition by condemnation or otherwise, retention and disposition of land or interests therein, in order to implement that Act and rules, standards and guidelines adopted pursuant thereto. The Energy Facility

Siting Council may adopt, amend or repeal rules in accordance with ORS 183.310 to 183.500 and may receive and disburse funds in connection with the implementation and administration of this section.

(2) The Governor may do any and all things necessary to implement the requirements of the federal Act referred to in subsection (1) of this section.

SECTION 10. This Act being necessary for the immediate preservation of the public peace, health and safety, an emergency is declared to exist, and this Act takes effect on its passage.

HOUSE AMENDMENTS TO PRINTED C-ENGROSSED SENATE BILL 394

By COMMITTEE ON ENVIRONMENT AND ENERGY

May 24

Amended Summary

Redefines "radioactive waste" and "waste disposal facility." Requires Health Division to contract for an independent study to be made of public health hazards of radioactive waste and report to next Legislative Assembly. Prohibits establishment, operation or licensing of any radioactive waste disposal facility. Provides that, prior to [*July 1*] **December 31**, 1981, maintenance of radioactive waste deposited prior to March 1, 1979, shall not constitute operation of a waste disposal facility. **Provides that maintenance of radioactive coal ash at thermal power plant site does not constitute operation of waste disposal facility if specified condition met.** Specifies that site certificate for waste disposal facilities for uranium mill tailings, mill wastes and mill by-product material shall not be issued unless certain findings are made. Requires those persons maintaining radioactive wastes deposited prior to March 1, 1979, to pay a proportionate share of the costs necessary for Health Division to carry out the study required by Act. Requires persons desiring to construct or operate a uranium mill or uranium mill tailings disposal facility to file a site certificate application with Energy Facility Siting Council. Permits council to adopt rules relating to uranium mill and tailings disposal facilities. Permits council to enter into certain agreements with Secretary of Energy.

Declares emergency, effective on passage.

On page 3 of the printed C-engrossed bill, line 34, delete "July 1" and insert "December 31".

After line 35, insert:

"(3) Maintenance of radioactive coal ash at the site of a thermal power plant for which a site certificate has been issued pursuant to this chapter shall not constitute operation of a waste disposal facility so long as such coal ash is maintained in accordance with the terms of the site certificate as amended from time to time as necessary to protect the public health and safety."

DIVISION 50

RADIOACTIVE WASTE MATERIALS

Disposal Sites for Radioactive Materials
345-50-005 [NTEC 3, f. 5-19-72, ef. 6-1-72; Repealed by EFSC 9-1978, f. 12-28-78, ef. 3-1-79]

Disposal Prohibited
345-50-006 Effective May 1, 1979, except as provided herein, no discarded or unwanted radioactive material may be held or placed for more than seven days at any geographical site in Oregon except the site at which the radioactive material was used or generated pursuant to a license under ORS 453.635 or a site of a thermal power plant used for the temporary storage of radioactive material from that plant for which a site certificate has been issued by the Energy Facility Siting Council.

Stat. Auth.: ORS Ch. 469
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79; EFSC 1-1979(Temp), f. & ef. 3-5-79

Purpose and Applicability
345-50-010 Since virtually all materials contain some measure of radioactivity, it is the purpose of these rules to identify those materials which present such small health hazards that they are exempt from the provisions of ORS 469.525 (1977 Replacement Part) as incorporated in rule 345-50-006 and may be disposed of within the state.

Stat. Auth.: ORS Ch. 469
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79

Exempt Quantities
345-50-020 Materials are exempt from provisions of ORS 469.525 provided that such materials contain radioactive material in individual quantities none of which exceeds that applicable quantity set forth in Table 2 and provided that the number of individual quantities does not exceed 10.

Stat. Auth.: ORS Ch. 469
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79

Exempt Concentrations
345-50-025 Materials are exempt from the provisions of ORS 469.525 provided that such materials contain radioactive materials in concentrations not in excess of those of Table 1.

Stat. Auth.: ORS Ch. 469
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79

Specific Exemptions
345-50-030 In addition to the exemptions under rules 345-50-020 and 345-50-025, the following materials are exempt from the provisions of rule 345-50-006 (or ORS 469.525):

(1) Radioactive material which has been incorporated into a consumer product manufactured under a license issued by the Nuclear Regulatory Commission, or an Agreement State and for which the agency licensing such manufacturer has determined that the possession, use, transfer, and disposal of such consumer product by all persons is exempt from regulatory requirements.

(2) Radium-bearing materials containing less than 5 picocuries of radium-226 per gram of solid, regardless of quantity.

(3) Radium-bearing material containing a total radium-226 activity of less than 10 microcuries, regardless of concentration.

(4) Thorium-bearing materials containing less than 20 picocuries of radium-228 per gram of solid, providing that the radium-228 is present with the parent thorium-232, regardless of quantity.

(5) Thorium-bearing materials containing a total radium-228 activity of less than 100 microcuries, providing that the radium-228 is present with the parent thorium-232, regardless of concentration in the solid.

Stat. Auth.: ORS Ch. 469
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79

Pathway Exemption
345-50-035 Naturally occurring radioactive materials shall be exempt from the provisions of rule 345-50-006 (or ORS 469.525) if it can be demonstrated that accumulation of material will not result in exposures exceeding 500 millirem of external gamma radiation per year, nor in the release of effluents to air and water in annual average concentrations exceeding the values in Table 3. An evaluation of potential radiation exposures and effluent releases shall be performed using the following premises:

(1) The material shall be considered in the form it exists when it is removed from the users' equipment, systems, or settling ponds prior to any dilution or remedial action designed to reduce radiation levels.

(2) No consideration shall be given to the ameliorating effects of land use restrictions, maintenance operations, or overburden at the disposal site.

(3) Accumulations of material over the reasonably projected period of waste generation shall be evaluated.

(4) External gamma radiation exposures shall be based on actual measurement and allowance may be made for the degree of equilibrium and for self-shielding.

(5) In computing radon concentrations in the air above a disposal site containing radium-226, the following additional premises shall be used:

(a) Any house built on ground contaminated with radium-226 is assumed to have an 8 foot high ceiling on the first floor, to have one complete air change per hour, and to have a foundation constructed so as to meet the Structural Specialty Code (State of Oregon Uniform Building Code) effective at the time of adoption of these rules. No consideration will be allowed for any special construction or treatments designed to reduce radon diffusion into the structure.

(b) The relation between radon-emanation rate and radium concentration will be based upon experimental measurements on material intended for disposal.

Stat. Auth.: ORS Ch. 460
Hist: EFSC 9-1978, f. 12-28-78, ef. 3-1-79

TABLE 1 *
(345-50-025)

EXEMPT CONCENTRATIONS

(See notes at end of Table 1)

Element (atomic number)	Isotope	Liquid and Solid Concentration (μCi/ml for liquids) (uCi/gm for solids)
Antimony (51)	Sb-122	$3X10^{-4}$
	Sb-124	$2X10^{-4}$
	Sb-125	$1X10^{-3}$
Argon (18)	Ar-37	(a)
	Ar-41	(a)
Arsenic (33)	As-73	$5X10^{-3}$
	As-74	$5X10^{-4}$
	As-76	$2X10^{-4}$
	As-77	$8X10^{-4}$
Barium (56)	Ba-131	$2X10^{-3}$
	Ba-140	$3X10^{-4}$
Beryllium (4)	Be-7	$2X10^{-2}$
Bismuth (83)	Bi-206	$4X10^{-4}$
Bromine (35)	Br-82	$3X10^{-3}$
Cadmium (48)	Cd-109	$2X10^{-3}$
	Cd-115m	$3X10^{-4}$
	Cd-115	$3X10^{-4}$
Calcium (20)	Ca-45	$9X10^{-5}$
	Ca-47	$5X10^{-4}$
Carbon (6)	C-14	$8X10^{-3}$
Cerium (58)	Ce-141	$9X10^{-4}$
	Ce-143	$4X10^{-4}$
	Ce-144	$1X10^{-4}$
Cesium (55)	Cs-131	$2X10^{-2}$
	Cs-134m	$6X10^{-2}$
	Cs-134	$9X10^{-5}$
Chlorine (17)	Cl-38	$4X10^{-3}$
Chromium (24)	Cr-51	$2X10^{-2}$
Cobalt (27)	Co-57	$5X10^{-3}$
	Co-58	$1X10^{-3}$
	Co-60	$5X10^{-4}$
Copper (29)	Cu-64	$3X10^{-3}$
Dysprosium (66)	Dy-165	$4X10^{-3}$
	Dy-166	$4X10^{-4}$
Erbium (68)	Er-169	$9X10^{-4}$
	Er-171	$1X10^{-3}$

*Unless otherwise noted, this table is identical to Schedule A, Part B of the State of Oregon Regulations for the Control of Radiation.

Element (atomic number)	Isotope	Liquid and Solid Concentration (uCi/ml for liquids) (uCi/gm for solids)
Europium (63)	Eu-152 (T =9.2 h)	$6X10^{-4}$
	Eu-155	$2X10^{-3}$
Fluorine (9)	F-18	$8X10^{-3}$
Gadolinium (64)	Gd-153	$2X10^{-3}$
	Gd-159	$8X10^{-4}$
Gallium (31)	Ga-72	$4X10^{-4}$
Germanium (32)	Ge-71	$2X10^{-2}$
Gold (79)	Au-196	$2X10^{-3}$
	Au-198	$5X10^{-4}$
	Au-199	$2X10^{-3}$
Hafnium (72)	Hf-181	$7X10^{-4}$
Hydrogen (1)	H-3	$3X10^{-2}$
Indium (49)	In-113m	$1X10^{-2}$
	In-114m	$2X10^{-4}$
Iodine (53)	I-126	$2X10^{-5}$
	I-131	$2X10^{-5}$
	I-132	$6X10^{-4}$
	I-133	$7X10^{-5}$
	I-134	$1X10^{-3}$
Iridium (77)	Ir-190	$2X10^{-3}$
	Ir-192	$4X10^{-4}$
	Ir-194	$3X10^{-4}$
Iron (26)	Fe-55	$8X10^{-3}$
	Fe-59	$6X10^{-4}$
Krypton (36)	Kr-85m	(a)
	Kr-85	(a)
Lanthanum (57)	La-140	$2X10^{-4}$
Lead (82)	Pb-203	$4X10^{-3}$
Lutetium (71)	Lu-177	$1X10^{-3}$
Manganese (25)	Mn-52	$3X10^{-4}$
	Mn-54	$1X10^{-3}$
	Mn-56	$1X10^{-3}$
Mercury (80)	Hg-197m	$2X10^{-3}$
	Hg-197	$3X10^{-3}$
	Hg-203	$2X10^{-4}$
Molybdenum (42)	Mo-99	$2X10^{-3}$
Neodymium (60)	Nd-147	$6X10^{-4}$
	Nd-149	$3X10^{-3}$
Nickel (28)	Ni-65	$1X10^{-3}$
Niobium (Columbium)(41)	Nb-95	$1X10^{-3}$
	Nb-97	$9X10^{-3}$

Element (atomic number)	Isotope	Liquid and Solid Concentration (uCi/ml for liquids) (uCi/gm for solids)
Osmium (76)	Os-185	$7X10^{-4}$
	Os-191m	$3X10^{-2}$
	Os-191	$2X10^{-3}$
	Os-193	$6X10^{-4}$
Palladium (46)	Pd-103	$3X10^{-3}$
	Pd-109	$9X10^{-4}$
Phosphorus (15)	P-32	$2X10^{-4}$
Platinum (78)	Pt-191	$1X10^{-3}$
	Pt-193m	$1X10^{-2}$
	Pt-197m	$1X10^{-2}$
	Pt-197	$1X10^{-3}$
Potassium (19)	K-42	$3X10^{-3}$
Praseodymium (59)	Pr-142	$3X10^{-4}$
	Pr-143	$5X10^{-4}$
Promethium (61)	Pm-147	$2X10^{-3}$
	Pm-149	$4X10^{-4}$
Rhenium (75)	Re-183	$6X10^{-3}$
	Re-186	$9X10^{-4}$
	Re-188	$6X10^{-4}$
Rhodium (45)	Rh-103m	$1X10^{-1}$
	Rh-105	$1X10^{-3}$
Rubidium (37)	Rb-86	$7X10^{-4}$
Ruthenium (44)	Ru-97	$4X10^{-3}$
	Ru-103	$8X10^{-4}$
	Ru-105	$1X10^{-3}$
	Ru-106	$1X10^{-4}$
Samarium (62)	Sm-153	$8X10^{-4}$
Scandium (21)	Sc-46	$4X10^{-4}$
	Sc-47	$9X10^{-4}$
	Sc-48	$3X10^{-4}$
Selenium (34)	Se-75	$3X10^{-3}$
Silicon (14)	Si-31	$9X10^{-3}$
Silver (47)	Ag-105	$1X10^{-3}$
	Ag-110m	$3X10^{-4}$
	Ag-111	$4X10^{-4}$
Sodium (11)	Na-24	$2X10^{-3}$
Strontium (38)	Sr-85	$1X10^{-3}$
	Sr-89	$1X10^{-4}$
	Sr-91	$7X10^{-4}$
	Sr-92	$7X10^{-4}$

Element (atomic number)	Isotope	Liquid and Solid Concentration (uCi/ml for liquids) (uCi/gm for solids)
Sulfur (16)	S-35	$6X10^{-4}$
Tantalum (73)	Ta-182	$4X10^{-4}$
Technetium (43)	Tc-96m	$1X10^{-1}$
	Tc-96	$1X10^{-3}$
Tellurium (52)	Te-125m	$2X10^{-3}$
	Te-127m	$6X10^{-4}$
	Te-127	$3X10^{-3}$
	Te-129m	$3X10^{-4}$
	Te-131m	$6X10^{-4}$
	Te-132	$3X10^{-4}$
Terbium (65)	Tb-160	$4X10^{-4}$
Thallium (81)	Tl-200	$4X10^{-3}$
	Tl-201	$3X10^{-3}$
	Tl-202	$1X10^{-3}$
	Tl-204	$1X10^{-3}$
Thulium (69)	Tm-170	$5X10^{-4}$
	Tm-171	$5X10^{-3}$
Tin (50)	Sn-113	$9X10^{-4}$
	Sn-125	$2X10^{-4}$
Tungsten (Wolfram)(74)	W-181	$4X10^{-3}$
	W-187	$7X10^{-4}$
Vanadium (23)	V-48	$3X10^{-4}$
Xenon (54)	Xe-131m	(a)
	Xe-133	(a)
	Xe-135	(a)
Ytterbium (70)	Yb-175	$1X10^{-3}$
Yttrium (39)	Y-90	$2X10^{-4}$
	Y-91m	$3X10^{-2}$
	Y-91	$3X10^{-4}$
	Y-92	$6X10^{-4}$
	Y-93	$3X10^{-4}$
Zinc (30)	Zn-65	$1X10^{-3}$
	Zn-69m	$7X10^{-4}$
	Zn-69	$2X10^{-2}$
Zirconium (40)	Zr-95	$6X10^{-4}$
	Zr-97	$2X10^{-4}$
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years.		$1X10^{-6}$

NOTE 1. Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in Table I the activity stated is that of the parent isotope and takes into account the daughters.

NOTE 2. For purposes of OAR 345-60-025 where there is involved a combination of isotopes, the limit for the combination should be derived as follows: Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in Table I for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (i.e., unity).

EXAMPLE:

$$\frac{\text{Concentration of Isotope A in Product}}{\text{Exempt concentration of Isotope A}} + \frac{\text{Concentration of Isotope B in Product}}{\text{Exempt concentration of Isotope B}} \leq 1$$

(a) These rules are intended to apply only to liquid or solid wastes.

TABLE 2*
(345-50-020)

EXEMPT QUANTITIES

Radioactive Material	Microcuries	Radioactive Material	Microcuries
Antimony-122 (Sb-122)	100	Europium-152 (Eu-152) 9.2h	100
Antimony-124 (Sb-124)	10	Europium-152 (Eu-152) 13 yr	1
Antimony-125 (Sb-125)	10	Europium-154 (Eu-154)	1
Arsenic-73 (As-73)	100	Europium-155 (Eu-155)	10
Arsenic-74 (As-74)	10	Fluorine-18 (F-18)	1,000
Arsenic-76 (As-76)	10	Gadolinium-153 (Gd-153)	10
Arsenic-77 (As-77)	100	Gadolinium-159 (Gd-159)	100
Barium-131 (Ba-131)	10	Gallium-67 (Ga-67)	100
Barium-133 (Ba-133)	10	Gallium-72 (Ga-72)	10
Barium-140 (Ba-140)	10	Germanium-71 (Ge-71)	100
Bismuth-210 (Bi-210)	1	Gold-198 (Au-198)	100
Bromine-82 (Br-82)	10	Gold-199 (Au-199)	100
Cadmium-109 (Cd-109)	10	Hafnium-181 (Hf-181)	10
Cadmium-115m (Cd-115m)	10	Holmium-166 (Ho-166)	100
Cadmium-115 (Cd-115)	100	Hydrogen-3 (H-3)	1,000
Calcium-45 (Ca-45)	10	Indium-111 (In-111)	100
Calcium-47 (Ca-47)	10	Indium-113m (In-113m)	100
Carbon-14 (C-14)	100	Indium-114m (In-114m)	10
Cerium-141 (Ce-141)	100	Indium-115m (In-115m)	100
Cerium-143 (Ce-143)	100	Indium-115 (In-115)	10
Cerium-144 (Ce-144)	1	Iodine-123 (I-123)	100
Cesium-129 (Cs-129)	100	Iodine-125 (I-125)	1
Cesium-131 (Cs-131)	1,000	Iodine-126 (I-126)	1
Cesium-134m (Cs-134m)	100	Iodine-129 (I-129)	0.1
Cesium-134 (Cs-134)	1	Iodine-131 (I-131)	1
Cesium-135 (Cs-135)	10	Iodine-132 (I-132)	10
Cesium-136 (Cs-136)	10	Iodine-133 (I-133)	1
Cesium-137 (Cs-137)	10	Iodine-134 (I-134)	10
Chlorine-36 (Cl-36)	10	Iodine-135 (I-135)	10
Chlorine-38 (Cl-38)	10	Iridium-192 (Ir-192)	10
Chromium-51 (Cr-51)	1,000	Iridium-194 (Ir-194)	100
Cobalt-57 (Co-57)	100	Iron-52 (Fe-52)	10
Cobalt 58m (Co-58m)	10	Iron-55 (Fe-55)	100
Cobalt-58 (Co-58)	10	Iron-59 (Fe-59)	10
Cobalt-60 (Co-60)	1	Krypton-85 (Kr-85)	100
Copper-64 (Cu-64)	100	Krypton-87 (Kr-87)	10
Dysprosium-165(Dy-165)	10	Lanthanum-140 (La-140)	10
Dysprosium-166 (Dy-166)	100	Lutetium-177 (Lu-177)	100
Erbium-169 (Er-169)	100	Manganese-52 (Mn-52)	10
Erbium-171 (Er-171)	100	Manganese-54 (Mn-54)	10

*Unless otherwise noted, this table is identical to Schedule C, Part B of the State of Oregon Regulations for the Control of Radiation.

Radioactive Material	Microcuries	Radioactive Material	Microcuries
Manganese-56 (Mn-56	10	Silver-110m (Ag-110m)	1
Mercury-197m (Hg-197m)	100	Silver-111 (Ag-111)	100
Mercury-197 (Hg-197)	100	Sodium-22 (Na-22)	10
Mercury-203 (Hg-203)	10	Sodium-24 (Na-24)	10
Molybdenum-99 (Mo-99)	100	Strontium-85 (Sr-85)	10
Neodymium-147 (Nd-147)	100	Strontium-89 (Sr-89)	1
Neodymium-149 (Nd-149)	100	Strontium-90 (Sr-90)	0.1
Nickel-59 (Ni-59)	100	Strontium-91 (Sr-91)	10
Nickel-63 (Ni-63)	10	Strontium-92 (Sr-92)	10
Nickel-65 (Ni-65)	100	Sulphur-35 (S-35)	100
Niobium-93m (Nb-93m)	10	Tantalum-182 (Ta-182)	10
Niobium-95 (Nb-95)	10	Technetium-96 (Tc-96)	10
Niobium-97 (Nb-97)	10	Technetium-97m (Tc-97m)	100
Osmium-185 (Os-185)	10	Technetium-97 (Tc-97)	100
Osmium-191m (Os-191m)	100	Technetium-99m (Tc-99m)	100
Osmium-191 (Os-191)	100	Technetium-99 (Tc-99)	10
Osmium-193 (Os-193)	100	Tellurium-125m (Te-125m)	10
Palladium-103 (Pd-103)	100	Tellurium-127m (Te-127m)	10
Palladium-109 (Pd-109)	100	Tellurium-127 (Te-127)	100
Phosphorus-32 (P-32)	10	Tellurium-129m (Te-129m)	10
Platinum-191 (Pt-191)	100	Tellurium-129 (Te-129)	100
Platinum-193m (Pt-193m)	100	Tellurium-131m (Te-131m)	10
Platinum-193 (Pt-193)	100	Tellurium-132 (Te-132)	10
Platinum-197m (Pt-197m)	100	Terbium-160 (Tb-160)	10
Platinum-197 (Pt-197)	100	Thallium-200 (Tl-200)	100
Polonium-210 (Po-210)	0.1	Thallium-201 (Tl-201)	100
Potassium-42 (K-42)	10	Thallium-202 (Tl-202)	100
Potassium-43 (K-43)	10	Thallium-204 (Tl-204)	10
Praseodymium-142 (Pr-142)	100	Thulium-170 (Tm-170)	10
Praseodymium-143 (Pr-143)	100	Thulium-171 (Tm-171)	10
Promethium-147 (Pm-147)	10	Tin-113 (Sn-113)	10
Promethium-149 (Pm-149)	10	Tin-125 (Sn-125)	10
Rhenium-186 (Re-186)	100	Tungsten-181 (W-181)	10
Rhenium-188 (Re-188)	100	Tungsten-185 (W-185)	10
Rhodium-103m (Rh-103m)	100	Tungsten-187 (W-187)	100
Rhodium-105 (Rh-105)	100	Vanadium-48 (V-48)	10
Rubidium-81 (Rh-81)	10	Xenon-131m (Xe-131m)	1,000
Rubidium-86 (Rh-86)	10	Xenon-133 (Xe-133)	100
Rubidium-87 (Rh-87)	10	Xenon-135 (Xe-135)	100
Ruthenium-97 (Ru-97)	100	Ytterbium-175 (Yb-175)	100
Ruthenium-103 (Ru-103)	10	Yttrium-87 (Y-87)	10
Ruthenium-105 (Ru-105)	10	Yttrium-90 (Y-90)	10
Ruthenium-106 (Ru-106)	1	Yttrium-91 (Y-91)	10

Samarium-151 (Sm-151)	10	Yttrium-92 (Y-92)	100
Samarium-153 (Sm-153)	100	Yttrium-93 (Y-93)	100
Scandium-46 (Sc-46)	10	Zinc-65 (Zn-65)	10
Scandium-47 (Sc-47)	100	Zinc-69m (Zn-69m)	100
Scandium-48 (Sc-48)	10	Zinc-69 (Zn-69)	1,000
Selenium-75 (Se-75)	10	Zirconium-93 (Zr-93)	10
Silicon-31 (Si-31)	100	Zirconium-95 (Zr-95)	10
Silver-105 (Ag-105)	10	Zirconium-97 (Zr-97)	10

Any radioactive material not listed above other than alpha emitting radioactive material 0.1

TABLE 3*

CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

(345-50-035)
(See notes at end of Table 3

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Actinium (89)	Ac-227	S	$8X10^{-14}$	$2X10^{-6}$
		I	$9X10^{-13}$	$3X10^{-4}$
	Ac-228	S	$3X10^{-9}$	$9X10^{-5}$
		I	$6X10^{-10}$	$9X10^{-5}$
Americium (95)	Am-241	S	$2X10^{-13}$	$4X10^{-6}$
		I	$4X10^{-12}$	$3X10^{-5}$
	Am-242m	S	$2X10^{-13}$	$4X10^{-6}$
		I	$9X10^{-12}$	$9X10^{-5}$
	Am-242	S	$1X10^{-9}$	$1X10^{-4}$
		I	$2X10^{-9}$	$1X10^{-4}$
	Am-243	S	$2X10^{-13}$	$4X10^{-6}$
		I	$4X10^{-12}$	$3X10^{-5}$
	Am-244	S	$1X10^{-7}$	$5X10^{-3}$
		I	$8X10^{-7}$	$5X10^{-3}$
Antimony (51)	Sb-122	S	$6X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
	Sb-124	S	$5X10^{-9}$	$2X10^{-5}$
		I	$7X10^{-10}$	$2X10^{-5}$
	Sb-125	S	$2X10^{-8}$	$1X10^{-4}$
		I	$9X10^{-10}$	$1X10^{-4}$
Argon (18)	Ar-37	Sub[2]	$1X10^{-4}$	------
	Ar-41	Sub	$4X10^{-8}$	------
Arsenic (33)	As-73	S	$7X10^{-8}$	$5X10^{-4}$
		I	$1X10^{-8}$	$5X10^{-4}$
	As-74	S	$1X10^{-8}$	$5X10^{-5}$
		I	$4X10^{-9}$	$5X10^{-5}$
	As-76	S	$4X10^{-9}$	$2X10^{-5}$
		I	$3X10^{-9}$	$2X10^{-5}$
	As-77	S	$2X10^{-8}$	$8X10^{-5}$
		I	$1X10^{-8}$	$8X10^{-5}$

*Unless otherwise noted, this table is copied from Table II, Appendix A, Part C of the State of Oregon Regulations for the Control of Radiation.

Element (Atomic number)	Isotope[1]		Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)
Astatine (85)	At-211	S	$2X10^{-10}$	$2X10^{-6}$
		I	$1X10^{-9}$	$7X10^{-5}$
Barium (56)	Ba-131	S	$4X10^{-8}$	$2X10^{-4}$
		I	$1X10^{-8}$	$2X10^{-4}$
	Ba-140	S	$4X10^{-9}$	$3X10^{-5}$
		I	$1X10^{-9}$	$2X10^{-5}$
Berkelium (97)	Bk-249	S	$3X10^{-11}$	$6X10^{-4}$
		I	$4X10^{-9}$	$6X10^{-4}$
	Bk-250	S	$5X10^{-9}$	$2X10^{-4}$
		I	$4X10^{-8}$	$2X10^{-4}$
Beryllium (4)	Be-7	S	$2X10^{-7}$	$2X10^{-3}$
		I	$4X10^{-8}$	$2X10^{-3}$
Bismuth (83)	Bi-206	S	$6X10^{-9}$	$4X10^{-5}$
		I	$5X10^{-9}$	$4X10^{-5}$
	Bi-207	S	$6X10^{-9}$	$6X10^{-5}$
		I	$5X10^{-10}$	$6X10^{-5}$
	Bi-210	S	$2X10^{-10}$	$4X10^{-5}$
		I	$2X10^{-10}$	$4X10^{-5}$
	Bi-212	S	$3X10^{-9}$	$4X10^{-4}$
		I	$7X10^{-9}$	$4X10^{-4}$
Bromine (35)	Br-82	S	$4X10^{-8}$	$3X10^{-4}$
		I	$6X10^{-9}$	$4X10^{-5}$
Cadmium (48)	Cd-109	S	$2X10^{-9}$	$2X10^{-4}$
		I	$3X10^{-9}$	$2X10^{-4}$
	Cd-115m	S	$1X10^{-9}$	$3X10^{-5}$
		I	$1X10^{-9}$	$3X10^{-5}$
	Cd-115	S	$8X10^{-9}$	$3X10^{-5}$
		I	$6X10^{-9}$	$4X10^{-5}$
Calcium (20)	Ca-45	S	$1X10^{-9}$	$9X10^{-6}$
		I	$4X10^{-9}$	$2X10^{-4}$
	Ca-47	S	$6X10^{-9}$	$5X10^{-5}$
		I	$6X10^{-9}$	$3X10^{-5}$
Californium (98)	Cf-249	S	$5X10^{-14}$	$4X10^{-6}$
		I	$3X10^{-12}$	$2X10^{-5}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
	Cf-250	S	$2X10^{-13}$	$1X10^{-5}$
		I	$3X10^{-12}$	$3X10^{-5}$
	Cf-251	S	$6X10^{-14}$	$4X10^{-6}$
		I	$3X10^{-12}$	$3X10^{-5}$
	Cf-252	S	$2X10^{-13}$	$7X10^{-6}$
		I	$1X10^{-12}$	$7X10^{-6}$
	Cf-253	S	$3X10^{-11}$	$1X10^{-4}$
		I	$3X10^{-11}$	$1X10^{-4}$
	Cf-254	S	$2X10^{-13}$	$1X10^{-7}$
		I	$2X10^{-13}$	$1X10^{-7}$
Carbon (6)	C-14	S	$1X10^{-7}$	$8X10^{-4}$
	(CO_2)	Sub[2]	$1X10^{-6}$	------
Cerium (58)	Ce-141	S	$2X10^{-8}$	$9X10^{-5}$
		I	$5X10^{-9}$	$9X10^{-5}$
	Ce-143	S	$9X10^{-9}$	$4X10^{-5}$
		I	$7X10^{-9}$	$4X10^{-5}$
	Ce-144	S	$3X10^{-10}$	$1X10^{-5}$
		I	$2X10^{-10}$	$1X10^{-5}$
Cesium (55)	Cs-131	S	$4X10^{-7}$	$2X10^{-3}$
		I	$1X10^{-7}$	$9X10^{-4}$
	Cs-134m	S	$1X10^{-6}$	$6X10^{-3}$
		I	$2X10^{-7}$	$1X10^{-3}$
	Cs-134	S	$1X10^{-9}$	$9X10^{-6}$
		I	$4X10^{-10}$	$4X10^{-5}$
	Cs-135	S	$2X10^{-8}$	$1X10^{-4}$
		I	$3X10^{-9}$	$2X10^{-4}$
	Cs-136	S	$1X10^{-8}$	$9X10^{-5}$
		I	$6X10^{-9}$	$6X10^{-5}$
	Cs-137	S	$2X10^{-9}$	$2X10^{-5}$
		I	$5X10^{-10}$	$4X10^{-5}$
Chlorine (17)	Cl-36	S	$1X10^{-8}$	$8X10^{-5}$
		I	$8X10^{-10}$	$6X10^{-5}$
	Cl-38	S	$9X10^{-8}$	$4X10^{-4}$
		I	$7X10^{-8}$	$4X10^{-4}$
Chromium (24)	Cr-51	S	$4X10^{-7}$	$2X10^{-3}$
		I	$8X10^{-8}$	$2X10^{-3}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Cobalt (27)	Co-57	S	$1X10^{-7}$	$5X10^{-4}$
		I	$6X10^{-9}$	$4X10^{-4}$
	Co-58m	S	$6X10^{-7}$	$3X10^{-3}$
		I	$3X10^{-7}$	$2X10^{-3}$
	Co-58	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-9}$	$9X10^{-5}$
	Co-60	S	$1X10^{-8}$	$5X10^{-5}$
		I	$3X10^{-10}$	$3X10^{-5}$
Copper (29)	Cu-64	S	$7X10^{-8}$	$3X10^{-4}$
		I	$4X10^{-8}$	$2X10^{-4}$
Curium (96)	Cm-242	S	$4X10^{-12}$	$2X10^{-5}$
		I	$6X10^{-12}$	$2X10^{-5}$
	Cm-243	S	$2X10^{-13}$	$5X10^{-6}$
		I	$3X10^{-12}$	$2X10^{-5}$
	Cm-244	S	$3X10^{-13}$	$7X10^{-6}$
		I	$3X10^{-12}$	$3X10^{-5}$
	Cm-245	S	$2X10^{-13}$	$4X10^{-6}$
		I	$4X10^{-12}$	$3X10^{-5}$
	Cm-246	S	$2X10^{-13}$	$4X10^{-6}$
		I	$4X10^{-12}$	$3X10^{-5}$
	Cm-247	S	$2X10^{-13}$	$4X10^{-6}$
		I	$4X10^{-12}$	$2X10^{-5}$
	Cm-248	S	$2X10^{-14}$	$4X10^{-7}$
		I	$4X10^{-13}$	$1X10^{-6}$
	Cm-249	S	$4X10^{-7}$	$2X10^{-3}$
		I	$4X10^{-7}$	$2X10^{-3}$
Dysprosium (66)	Dy-165	S	$9X10^{-8}$	$4X10^{-4}$
		I	$7X10^{-8}$	$4X10^{-4}$
	Dy-166	S	$8X10^{-9}$	$4X10^{-5}$
		I	$7X10^{-9}$	$4X10^{-5}$
Einsteinium (99)	Es-253	S	$3X10^{-11}$	$2X10^{-5}$
		I	$2X10^{-11}$	$2X10^{-5}$
	Es-254m	S	$2X10^{-10}$	$2X10^{-5}$
		I	$2X10^{-10}$	$2X10^{-5}$
	Es-254	S	$6X10^{-13}$	$1X10^{-5}$
		I	$4X10^{-12}$	$1X10^{-5}$
	Es-255	S	$2X10^{-11}$	$3X10^{-5}$
		I	$1X10^{-11}$	$3X10^{-5}$
Erbium (68)	Er-169	S	$2X10^{-8}$	$9X10^{-5}$
		I	$1X10^{-8}$	$9X10^{-5}$
	Er-171	S	$2X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$

Element (atomic number)	Isotope		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Europium (63)	Eu-152	S	$1X10^{-8}$	$6X10^{-5}$
	(T =9.2 hrs)	I	$1X10^{-8}$	$6X10^{-5}$
	Eu-152	S	$4X10^{-10}$	$8X10^{-5}$
	(T =13 yrs)	I	$6X10^{-10}$	$8X10^{-5}$
	Eu-154	S	$1X10^{-10}$	$2X10^{-5}$
		I	$2X10^{-10}$	$2X10^{-5}$
	Eu-155	S	$3X10^{-9}$	$2X10^{-4}$
		I	$3X10^{-9}$	$2X10^{-4}$
Fermium (100)	Fm-254	S	$2X10^{-9}$	$1X10^{-4}$
		I	$2X10^{-9}$	$1X10^{-4}$
	Fm-255	S	$6X10^{-10}$	$3X10^{-5}$
		I	$4X10^{-10}$	$3X10^{-5}$
	Fm-256	S	$1X10^{-10}$	$9X10^{-7}$
		I	$6X10^{-11}$	$9X10^{-7}$
Fluorine (9)	F-18	S	$2X10^{-7}$	$8X10^{-4}$
		I	$9X10^{-8}$	$5X10^{-4}$
Gadolinium (64)	Gd-153	S	$8X10^{-9}$	$2X10^{-4}$
		I	$3X10^{-9}$	$2X10^{-4}$
	Gd-159	S	$2X10^{-8}$	$8X10^{-5}$
		I	$1X10^{-8}$	$8X10^{-5}$
Gallium (31)	Ga-72	S	$8X10^{-9}$	$4X10^{-5}$
		I	$6X10^{-9}$	$4X10^{-5}$
Germanium (32)	Ge-71	S	$4X10^{-7}$	$2X10^{-3}$
		I	$2X10^{-7}$	$2X10^{-3}$
Gold (79)	Au-196	S	$4X10^{-8}$	$2X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
	Au-198	S	$1X10^{-8}$	$5X10^{-5}$
		I	$8X10^{-9}$	$5X10^{-5}$
	Au-199	S	$4X10^{-8}$	$2X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-4}$
Hafnium (72)	Hf-181	S	$1X10^{-9}$	$7X10^{-5}$
		I	$3X10^{-9}$	$7X10^{-5}$
Holmium (67)	Ho-166	S	$7X10^{-9}$	$3X10^{-5}$
		I	$6X10^{-9}$	$3X10^{-5}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Hydrogen (1)	H-3	S	$2X10^{-7}$	$3X10^{-3}$
		I	$2X10^{-7}$	$3X10^{-3}$
		Sub[2]	$4X10^{-5}$	------
Indium (49)	In-113m	S	$3X10^{-7}$	$1X10^{-3}$
		I	$2X10^{-7}$	$1X10^{-3}$
	In-114m	S	$4X10^{-9}$	$2X10^{-5}$
		I	$7X10^{-10}$	$2X10^{-5}$
	In-115m	S	$8X10^{-8}$	$4X10^{-4}$
		I	$6X10^{-8}$	$4X10^{-4}$
	In-115	S	$9X10^{-9}$	$9X10^{-5}$
		I	$1X10^{-9}$	$9X10^{-5}$
Iodine (53)	I-125	S	$8X10^{-11}$	$2X10^{-7}$
		I	$6X10^{-9}$	$2X10^{-4}$
	I-126	S	$9X10^{-11}$	$3X10^{-7}$
		I	$1X10^{-8}$	$9X10^{-5}$
	I-129	S	$2X10^{-11}$	$6X10^{-8}$
		I	$2X10^{-9}$	$2X10^{-4}$
	I-131	S	$1X10^{-10}$	$3X10^{-7}$
		I	$1X10^{-8}$	$6X10^{-5}$
	I-132	S	$3X10^{-9}$	$8X10^{-6}$
		I	$3X10^{-8}$	$2X10^{-4}$
	I-133	S	$4X10^{-10}$	$1X10^{-6}$
		I	$7X10^{-9}$	$4X10^{-5}$
	I-134	S	$6X10^{-9}$	$2X10^{-5}$
		I	$1X10^{-7}$	$6X10^{-4}$
	I-135	S	$1X10^{-9}$	$4X10^{-6}$
		I	$1X10^{-8}$	$7X10^{-5}$
Iridium (77)	Ir-190	S	$4X10^{-8}$	$2X10^{-4}$
		I	$1X10^{-8}$	$2X10^{-4}$
	Ir-192	S	$4X10^{-9}$	$4X10^{-5}$
		I	$9X10^{-10}$	$4X10^{-5}$
	Ir-194	S	$8X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
Iron (26)	Fe-55	S	$3X10^{-8}$	$8X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-3}$
	Fe-59	S	$5X10^{-9}$	$6X10^{-5}$
		I	$2X10^{-9}$	$5X10^{-5}$
Krypton (36)	Kr-85m	Sub[2]	$1X10^{-7}$	------
	Kr-85	Sub	$3X10^{-7}$	------
	Kr-87	Sub	$2X10^{-8}$	------
	Kr-88	Sub	$2X10^{-8}$	------

Element (atomic number)	Isotope[2]		Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)
Lanthanum (57)	La-140	S	$5X10^{-9}$	$2X10^{-5}$
		I	$4X10^{-9}$	$2X10^{-5}$
Lead (82)	Pb-203	S	$9X10^{-8}$	$4X10^{-4}$
		I	$6X10^{-8}$	$4X10^{-4}$
	Pb-210	S	$4X10^{-12}$	$1X10^{-7}$
		I	$8X10^{-12}$	$2X10^{-4}$
	Pb-212	S	$6X10^{-10}$	$2X10^{-5}$
		I	$7X10^{-10}$	$2X10^{-5}$
Lutetium (71)	Lu-177	S	$2X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Manganese (25)	Mn-52	S	$7X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
	Mn-54	S	$1X10^{-8}$	$1X10^{-4}$
		I	$1X10^{-9}$	$1X10^{-4}$
	Mn-56	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Mercury (80)	Hg-197m	S	$3X10^{-8}$	$2X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-4}$
	Hg-197	S	$4X10^{-8}$	$3X10^{-4}$
		I	$9X10^{-8}$	$5X10^{-4}$
	Hg-203	S	$2X10^{-9}$	$2X10^{-5}$
		I	$4X10^{-9}$	$1X10^{-4}$
Molybdenum (42)	Mo-99	S	$3X10^{-8}$	$2X10^{-4}$
		I	$7X10^{-9}$	$4X10^{-5}$
Neodymium (60)	Nd-144	S	$3X10^{-12}$	$7X10^{-5}$
		I	$1X10^{-11}$	$8X10^{-5}$
	Nd-147	S	$1X10^{-8}$	$6X10^{-5}$
		I	$8X10^{-9}$	$6X10^{-5}$
	Nd-149	S	$6X10^{-8}$	$3X10^{-4}$
		I	$5X10^{-8}$	$3X10^{-4}$
Neptunium (93)	Np-237	S	$1X10^{-13}$	$3X10^{-6}$
		I	$4X10^{-12}$	$3X10^{-5}$
	Np-239	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Nickel (28)	Ni-59	S	$2X10^{-8}$	$2X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-3}$
	Ni-63	S	$2X10^{-9}$	$3X10^{-5}$
		I	$1X10^{-8}$	$7X10^{-4}$

Element (atomic number)	Isotope[2]		Column 1 Air - (μCi/ml)	Column 2 Water (μCi/ml)
	Ni-65	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Niobium (41)	Nb-93m	S	$4X10^{-9}$	$4X10^{-4}$
		I	$5X10^{-9}$	$4X10^{-4}$
	Nb-95	S	$2X10^{-8}$	$1X10^{-4}$
		I	$3X10^{-9}$	$1X10^{-4}$
	Nb-97	S	$2X10^{-7}$	$9X10^{-4}$
		I	$2X10^{-7}$	$9X10^{-4}$
Osmium (76)	Os-185	S	$2X10^{-8}$	$7X10^{-5}$
		I	$2X10^{-9}$	$7X10^{-5}$
	Os-191m	S	$6X10^{-7}$	$3X10^{-3}$
		I	$3X10^{-7}$	$2X10^{-3}$
	Os-191	S	$4X10^{-8}$	$2X10^{-4}$
		I	$1X10^{-8}$	$2X10^{-4}$
	Os-193	S	$1X10^{-8}$	$6X10^{-5}$
		I	$9X10^{-9}$	$5X10^{-5}$
Palladium (46)	Pd-103	S	$5X10^{-8}$	$3X10^{-4}$
		I	$3X10^{-8}$	$3X10^{-4}$
	Pd-109	S	$2X10^{-8}$	$9X10^{-5}$
		I	$1X10^{-8}$	$7X10^{-5}$
Phosphorus (15)	P-32	S	$2X10^{-9}$	$2X10^{-5}$
		I	$3X10^{-9}$	$2X10^{-5}$
Platinum (78)	Pt-191	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
	Pt-193m	S	$2X10^{-7}$	$1X10^{-3}$
		I	$2X10^{-7}$	$1X10^{-3}$
	Pt-193	S	$4X10^{-8}$	$9X10^{-4}$
		I	$1X10^{-8}$	$2X10^{-3}$
	Pt-197m	S	$2X10^{-7}$	$1X10^{-3}$
		I	$2X10^{-7}$	$9X10^{-4}$
	Pt-197	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Plutonium (94)	Pu-238	S	$7X10^{-14}$	$5X10^{-6}$
		I	$1X10^{-12}$	$3X10^{-5}$
	Pu-239	S	$6X10^{-14}$	$5X10^{-6}$
		I	$1X10^{-12}$	$3X10^{-5}$
	Pu-240	S	$6X10^{-14}$	$5X10^{-6}$
		I	$1X10^{-12}$	$3X10^{-5}$
	Pu-241	S	$3X10^{-12}$	$2X10^{-4}$
		I	$1X10^{-9}$	$1X10^{-3}$
	Pu-242	S	$6X10^{-14}$	$5X10^{-6}$
		I	$1X10^{-12}$	$3X10^{-5}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
	Pu-243	S	$6X10^{-8}$	$3X10^{-4}$
		I	$8X10^{-8}$	$3X10^{-4}$
	Pu-244	S	$6X10^{-14}$	$4X10^{-6}$
		I	$1X10^{-12}$	$1X10^{-5}$
Polonium (84)	Po-210	S	$2X10^{-11}$	$7X10^{-7}$
		I	$7X10^{-12}$	$3X10^{-5}$
Potassium (19)	K-42	S	$7X10^{-8}$	$3X10^{-4}$
		I	$4X10^{-9}$	$2X10^{-5}$
Praseodymium (59)	Pr-142	S	$7X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
	Pr-143	S	$1X10^{-8}$	$5X10^{-5}$
		I	$6X10^{-9}$	$5X10^{-5}$
Promethium (61)	Pm-147	S	$2X10^{-9}$	$2X10^{-4}$
		I	$3X10^{-9}$	$2X10^{-4}$
	Pm-149	S	$1X10^{-8}$	$4X10^{-5}$
		I	$8X10^{-9}$	$4X10^{-5}$
Protactinium (91)	Pa-230	S	$6X10^{-11}$	$2X10^{-4}$
		I	$3X10^{-11}$	$2X10^{-4}$
	Pa-231	S	$4X10^{-14}$	$9X10^{-7}$
		I	$4X10^{-12}$	$2X10^{-5}$
	Pa-233	S	$2X10^{-8}$	$1X10^{-4}$
		I	$6X10^{-9}$	$1X10^{-4}$
Radium (88)	Ra-223	S	$6X10^{-11}$	$7X10^{-7}$
		I	$8X10^{-12}$	$4X10^{-6}$
	Ra-224	S	$2X10^{-10}$	$2X10^{-6}$
		I	$2X10^{-11}$	$5X10^{-6}$
	Ra-226	S	$3X10^{-12}$	$3X10^{-8}$
		I	$2X10^{-12}$	$3X10^{-5}$
	Ra-228	S	$2X10^{-12}$	$3X10^{-8}$
		I	$1X10^{-12}$	$3X10^{-5}$
Radon (86)	Rn-220	S	$1X10^{-8}$	------
		I	------	------
	Rn-222[3]	S	$3X10^{-9}$	------
Rhenium (75)	Re-183	S	$9X10^{-8}$	$6X10^{-4}$
		I	$5X10^{-9}$	$3X10^{-4}$

Element (atomic number)	Isotope[1]		Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)
	Re-186	S	$2X10^{-8}$	$9X10^{-5}$
		I	$8X10^{-9}$	$5X10^{-5}$
	Re-187	S	$3X10^{-7}$	$3X10^{-3}$
		I	$2X10^{-8}$	$2X10^{-3}$
	Re-188	S	$1X10^{-8}$	$6X10^{-5}$
		I	$6X10^{-9}$	$3X10^{-5}$
Rhodium (45)	Rh-103m	S	$3X10^{-6}$	$1X10^{-2}$
		I	$2X10^{-6}$	$1X10^{-2}$
	Rh-105	S	$3X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
Rubidium (37)	Rb-86	S	$1X10^{-8}$	$7X10^{-5}$
		I	$2X10^{-9}$	$2X10^{-5}$
	Rb-87	S	$2X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-9}$	$2X10^{-4}$
Ruthenium (44)	Ru-97	S	$8X10^{-8}$	$4X10^{-4}$
		I	$6X10^{-8}$	$3X10^{-4}$
	Ru-103	S	$2X10^{-8}$	$8X10^{-5}$
		I	$3X10^{-9}$	$8X10^{-5}$
	Ru-105	S	$2X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$
	Ru-106	S	$3X10^{-9}$	$1X10^{-5}$
		I	$2X10^{-10}$	$1X10^{-5}$
Samarium (62)	Sm-147	S	$2X10^{-12}$	$6X10^{-5}$
		I	$9X10^{-12}$	$7X10^{-5}$
	Sm-151	S	$2X10^{-9}$	$4X10^{-4}$
		I	$5X10^{-9}$	$4X10^{-4}$
	Sm-153	S	$2X10^{-8}$	$8X10^{-5}$
		I	$1X10^{-8}$	$8X10^{-5}$
Scandium (21)	Sc-46	S	$8X10^{-9}$	$4X10^{-5}$
		I	$8X10^{-10}$	$4X10^{-5}$
	Sc-47	S	$2X10^{-8}$	$9X10^{-5}$
		I	$2X10^{-8}$	$9X10^{-5}$
	Sc-48	S	$6X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
Selenium (34)	Se-75	S	$4X10^{-8}$	$3X10^{-4}$
		I	$4X10^{-9}$	$3X10^{-4}$
Silicon (14)	Si-31	S	$2X10^{-7}$	$9X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-4}$

Element (atomic number)	Isotope[1]		Column I Air (μCi/ml)	Column II Water (μCi/ml)
Silver (47)	Ag-105	S	$2X10^{-8}$	$1X10^{-4}$
		I	$3X10^{-9}$	$1X10^{-4}$
	Ag-110m	S	$7X10^{-9}$	$3X10^{-5}$
		I	$3X10^{-10}$	$3X10^{-5}$
	Ag-111	S	$1X10^{-8}$	$4X10^{-5}$
		I	$8X10^{-9}$	$4X10^{-5}$
Sodium (11)	Na-22	S	$6X10^{-9}$	$4X10^{-5}$
		I	$3X10^{-10}$	$3X10^{-5}$
	Na-24	S	$4X10^{-8}$	$2X10^{-4}$
		I	$5X10^{-9}$	$3X10^{-5}$
Strontium (38)	Sr-85m	S	$1X10^{-6}$	$7X10^{-3}$
		I	$1X10^{-6}$	$7X10^{-3}$
	Sr-85	S	$8X10^{-9}$	$1X10^{-4}$
		I	$4X10^{-9}$	$2X10^{-4}$
	Sr-89	S	$3X10^{-10}$	$3X10^{-6}$
		I	$1X10^{-9}$	$3X10^{-5}$
	Sr-90	S	$3X10^{-11}$	$3X10^{-7}$
		I	$2X10^{-10}$	$4X10^{-5}$
	Sr-91	S	$2X10^{-8}$	$7X10^{-5}$
		I	$9X10^{-9}$	$5X10^{-5}$
	Sr-92	S	$2X10^{-8}$	$7X10^{-5}$
		I	$1X10^{-8}$	$6X10^{-5}$
Sulfur (16)	S-35	S	$9X10^{-9}$	$6X10^{-5}$
		I	$9X10^{-9}$	$3X10^{-4}$
Tantalum (73)	Ta-182	S	$1X10^{-9}$	$4X10^{-5}$
		I	$7X10^{-10}$	$4X10^{-5}$
Technetium (43)	Tc-96m	S	$3X10^{-6}$	$1X10^{-2}$
		I	$1X10^{-6}$	$1X10^{-2}$
	Tc-96	S	$2X10^{-8}$	$1X10^{-4}$
		I	$8X10^{-9}$	$5X10^{-5}$
	Tc-97m	S	$8X10^{-8}$	$4X10^{-4}$
		I	$5X10^{-9}$	$2X10^{-4}$
	Tc-97	S	$4X10^{-7}$	$2X10^{-3}$
		I	$1X10^{-8}$	$8X10^{-4}$
	Tc-99m	S	$1X10^{-6}$	$6X10^{-3}$
		I	$5X10^{-7}$	$3X10^{-3}$
	Tc-99	S	$7X10^{-8}$	$3X10^{-4}$
		I	$2X10^{-9}$	$2X10^{-4}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Tellurium (52)	Te-125m	S	$1X10^{-8}$	$2X10^{-4}$
		I	$4X10^{-9}$	$1X10^{-4}$
	Te-127m	S	$5X10^{-9}$	$6X10^{-5}$
		I	$1X10^{-9}$	$5X10^{-5}$
	Te-127	S	$6X10^{-8}$	$3X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-4}$
	Te-129m	S	$3X10^{-9}$	$3X10^{-5}$
		I	$1X10^{-9}$	$2X10^{-5}$
	Te-129	S	$2X10^{-7}$	$8X10^{-4}$
		I	$1X10^{-7}$	$8X10^{-4}$
	Te-131m	S	$1X10^{-8}$	$6X10^{-5}$
		I	$6X10^{-9}$	$4X10^{-5}$
	Te-132	S	$7X10^{-9}$	$3X10^{-5}$
		I	$4X10^{-9}$	$2X10^{-5}$
Terbium (65)	Tb-160	S	$3X10^{-9}$	$4X10^{-5}$
		I	$1X10^{-9}$	$4X10^{-5}$
Thallium (81)	Tl-200	S	$9X10^{-8}$	$4X10^{-4}$
		I	$4X10^{-8}$	$2X10^{-4}$
	Tl-201	S	$7X10^{-8}$	$3X10^{-4}$
		I	$3X10^{-8}$	$2X10^{-4}$
	Tl-202	S	$3X10^{-8}$	$1X10^{-4}$
		I	$8X10^{-9}$	$7X10^{-5}$
	Tl-204	S	$2X10^{-8}$	$1X10^{-4}$
		I	$9X10^{-10}$	$6X10^{-5}$
Thorium (90)	Th-227	S	$1X10^{-11}$	$2X10^{-5}$
		I	$6X10^{-12}$	$2X10^{-5}$
	Th-228	S	$3X10^{-13}$	$7X10^{-6}$
		I	$2X10^{-13}$	$1X10^{-5}$
	Th-230	S	$8X10^{-14}$	$2X10^{-6}$
		I	$3X10^{-13}$	$3X10^{-5}$
	Th-231	S	$5X10^{-8}$	$2X10^{-4}$
		I	$4X10^{-8}$	$2X10^{-4}$
	Th-232	S	$1X10^{-12}$	$2X10^{-6}$
		I	$1X10^{-12}$	$4X10^{-5}$
	Th-natural			
		S	$2X10^{-12}$	$2X10^{-6}$
		I	$2X10^{-12}$	$2X10^{-5}$
	Th-234	S	$2X10^{-9}$	$2X10^{-5}$
		I	$1X10^{-9}$	$2X10^{-5}$
Thulium (69)	Tm-170	S	$1X10^{-9}$	$5X10^{-5}$
		I	$1X10^{-9}$	$5X10^{-5}$

Element (atomic number)	Isotope[1]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
	Tm-171	S	$4X10^{-9}$	$5X10^{-4}$
		I	$8X10^{-9}$	$5X10^{-4}$
Tin (50)	Sn-113	S	$1X10^{-8}$	$9X10^{-5}$
		I	$2X10^{-9}$	$8X10^{-5}$
	Sn-125	S	$4X10^{-9}$	$2X10^{-5}$
		I	$3X10^{-9}$	$2X10^{-5}$
Tungsten (74)	W-181	S	$8X10^{-8}$	$4X10^{-4}$
		I	$4X10^{-9}$	$3X10^{-4}$
	W-185	S	$3X10^{-8}$	$1X10^{-4}$
		I	$4X10^{-9}$	$1X10^{-4}$
	W-187	S	$2X10^{-8}$	$7X10^{-5}$
		I	$1X10^{-8}$	$6X10^{-5}$
Uranium (92)	U-230	S	$1X10^{-11}$	$5X10^{-6}$
		I	$4X10^{-12}$	$5X10^{-6}$
	U-232	S	$3X10^{-12}$	$3X10^{-5}$
		I	$9X10^{-13}$	$3X10^{-5}$
	U-233	S	$2X10^{-11}$	$3X10^{-5}$
		I	$4X10^{-12}$	$3X10^{-5}$
	U-234	S[4]	$2X10^{-11}$	$3X10^{-5}$
		I	$4X10^{-12}$	$3X10^{-5}$
	U-235	S[4]	$2X10^{-11}$	$3X10^{-5}$
		I	$4X10^{-12}$	$3X10^{-5}$
	U-236	S	$2X10^{-11}$	$3X10^{-5}$
		I	$4X10^{-12}$	$3X10^{-5}$
	U-238	S	$3X10^{-12}$	$4X10^{-5}$
		I	$5X10^{-12}$	$4X10^{-5}$
	U-240	S	$8X10^{-9}$	$3X10^{-5}$
		I	$6X10^{-9}$	$3X10^{-5}$
	U-natural	S[4]	$5X10^{-12}$	$3X10^{-5}$
		I	$5X10^{-12}$	$3X10^{-5}$
Vanadium (23)	V-48	S	$6X10^{-9}$	$3X10^{-5}$
		I	$2X10^{-9}$	$3X10^{-5}$
Xenon (54)	Xe-131m	Sub[2]	$4X10^{-7}$	------
	Xe-133m	Sub	$3X10^{-7}$	------
	Xe-133	Sub	$3X10^{-7}$	------
	Xe-135	Sub	$1X10^{-7}$	------
Ytterbium (70)	Yb-175	S	$2X10^{-8}$	$1X10^{-4}$
		I	$2X10^{-8}$	$1X10^{-4}$

Element (atomic number)	Isotope[2]		Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
Yttrium (39)	Y-90	S	$4X10^{-9}$	$2X10^{-5}$
		I	$3X10^{-9}$	$2X10^{-5}$
	Y-91m	S	$8X10^{-7}$	$3X10^{-3}$
		I	$6X10^{-7}$	$3X10^{-3}$
	Y-91	S	$1X10^{-9}$	$3X10^{-5}$
		I	$1X10^{-9}$	$3X10^{-5}$
	Y-92	S	$1X10^{-8}$	$6X10^{-5}$
		I	$1X10^{-8}$	$6X10^{-5}$
	Y-93	S	$6X10^{-9}$	$3X10^{-5}$
		I	$5X10^{-9}$	$3X10^{-5}$
Zinc (30)	Zn-65	S	$4X10^{-9}$	$1X10^{-4}$
		I	$2X10^{-9}$	$2X10^{-4}$
	Zn-69m	S	$1X10^{-8}$	$7X10^{-5}$
		I	$1X10^{-8}$	$6X10^{-5}$
	Zn-69	S	$2X10^{-7}$	$2X10^{-3}$
		I	$3X10^{-7}$	$2X10^{-3}$
Zirconium (40)	Zr-93	S	$4X10^{-9}$	$8X10^{-4}$
		I	$1X10^{-8}$	$8X10^{-4}$
	Zr-95	S	$4X10^{-9}$	$6X10^{-5}$
		I	$1X10^{-9}$	$6X10^{-5}$
	Zr-97	S	$4X10^{-9}$	$2X10^{-5}$
		I	$3X10^{-9}$	$2X10^{-5}$
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours.		Sub[2]	$3X10^{-8}$	------
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours.			$1X10^{-10}$	$3X10^{-6}$

Element (atomic number)	Isotope[1]	Column 1 Air (uCi/ml)	Column 2 Water (uCi/ml)
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.		$2X10^{-14}$	$3X10^{-8}$

[1]Soluble (S); Insoluble (I).

[2]"Sub" means that values given are for submersion in a semi-spherical infinite cloud of airborne material.

[3]These radon concentrations are appropriate for protection from radon-222 combined with its short-lived daughters. Alternatively, this value may be replaced by one-thirtieth (1/30) of a "working level". (A working level is defined as any combination of short-lived radon-222 daughters, polonium-218, lead-214, bismuth-214, and polonium-214, in one liter of air, without regard to the degree of equilibrium, that will result in the ultimate emission of $1.3x10^5$ MeV of alpha particle energy.)

[4]For soluble mixtures of U-238, U-234 and U-235 in air chemical toxicity may be the limiting factor. If the percent by weight (enrichment) of U-235 is less than 5, the concentration value is 0.007 milligrams uranium per cubic meter of air. The specific activity for natural uranium is 6.77×10^{-7} Curies per gram U. The specific activity for other mixtures of U-238, U-235 and U-234, if not known, shall be:

$SA = 3.6 \times 10^{-7}$ Curies/gram U_2 U-depleted

$SA = (0,4 + 0.38\ E + 0.0034\ E^2)(10^{-6})$ $E \geq 0.72$

where E is the percentage by weight of U-235, expressed as percent.

APPENDIX A of Table 3

NOTE: In any case where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this Appendix should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in Table III for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

   Example: If radionuclides a, b and c are present in concentrations C_a, C_b and C_c, and if the applicable MPC's are MPC_a, MPC_b and MPC_c respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \frac{C_c}{MPC_c} \leq 1$$

2. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of Table III shall be:

   a. For purposes of Table II, Col. 1 . . . . . $2X10^{-14}$
   b. For purposes of Table II, Col. 2 . . . . . $3X10^{-8}$

3. If any of the conditions specified below are met, the corresponding values specified below may be used in lieu of those specified in paragraph 2 above.

   a. If the identity of each radionuclide in the mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture is the limit specified in Table III for the radionuclide in the mixture having the lowest concentration limit; or

   b. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in Table III are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in Table III for any radionuclide which is not known to be absent from the mixture; or

c. Radionuclide	Column 1 Air (μCi/ml)	Column 2 Water (μCi/ml)
If it is known that Sr-90, I-125, I-126, I-129, I-131, (I-133 Table II only), Pb-210, Po-210, At-211, Ra-223, Ra-224, Ra-226, Ac-227, Ra-228, Th-230, Pa-231, Th-232, Th-nat, Cm-248, Cf-254 and Fm-256 are not present -------	------	$3X10^{-6}$
If it is known that Sr-90, I-125, I-126, I-129, (I-131, I-133, Table II only), Pb-210, Po-210, Ra-223, Ra-226, Ra-228, Pa-231, Th-nat, Cm-248, Cf-254 and Fm-256 are not present ----------	------	$2X10^{-6}$
If it is known that Sr-90, I-129, (I-125, I-126, I-131, Table II only), Pb-210, Ra-226, Ra-228, Cm-248 and Cf-254 are not present ----------	------	$6X10^{-7}$
If it is known that (I-129, Table II only), Ra-226 and Ra-228 are not present ----------	------	$1X10^{-7}$
If it is known that alpha-emitters and Sr-90, I-129, Pb-210, Ac-227, Ra-228, Pa-230, Pu-241 and Bk-249 are not present ----------	$1X10^{-10}$	------
If it is known that alpha-emitters and Pb-210, Ac-227, Ra-228 and Pu-241 are not present ----------	$1X10^{-11}$	------
If it is known that alpha-emitters and Ac-227 are not present -----	$1X10^{-12}$	------
If it is known that Ac-227, Th-230, Pa-231, Pu-238, Pu-239, Pu-240, Pu-242, Pu-244, Cm-248, Cf-249 and Cf-251 are not present ------	$1X10^{-13}$	------

4. If the mixture of radionuclides consists of uranium and its daughter products in ore dust prior to chemical processing of the uranium ore, the values specified below may be used in lieu of those determined in accordance with paragraph 1 above or those specified in paragraphs 2 and 3 above.

   For purposes of Table III Column 1, 3×10^{-12} uCi/ml gross alpha activity; 2×10^{-12} uCi/ml natural uranium; or 3 micrograms per cubic meter of air natural uranium.

5. For purposes of this note, a radionuclide may be considered as not present in a mixture if (a) the ratio of the concentration of that radionuclide in the mixture (C_a) to the concentration limit for that radionuclide specified in Table III (MPC_a) does not exceed 1/10, (i.e., considered as not present in the mixture does not exceed 1/4, (i.e., $C_a/MPC_a + C_b/MPC_b + \ldots \leq 1/4$).

DIVISION 60

TRANSPORTATION OF RADIOACTIVE MATERIAL

Definitions

345-60-001 For purpose of ORS 453.535 and as used in these rules:

(1) "Nuclear reactor fission products" means a mixture of radio-nuclides formed as a result of fission in a nuclear reactor. These fission products are normally present in spent nuclear fuel, radioactive wastes resulting from fuel reprocessing, and radioactive waste accumulated in the course of operation of nuclear reactor waste treatment systems.

(2) "Shipper" means a site certificate holder or other person originating a shipment of nuclear reactor fission products destined to move within or through the State of Oregon.

Stat. Auth.: ORS Ch.
Hist: NTEC 7, f. 2-20-74, ef. 3-11-74

Applicability and Scope

345-60-003 (1) These rules apply to the shipment of nuclear reactor fission products, in quantities greater than 10,000 curies, within or through the State of Oregon.

(2) Shipments made by or under the direction of the U.S. Atomic Energy Commission or the Department of Defense, and which are escorted by personnel designated by or under the authority of those agencies, for the purpose of national security, are exempt from these rules.

(3) These rules are in addition to applicable rules and regulations of the United States Department of Transportation and the United States Atomic Energy Commission.

Stat. Auth.: ORS Ch.
Hist: NTEC 7, f. 2-20-74, ef. 3-11-74

Notification

345-60-005 (1) All shipments as defined in rule 345-60-003(1), other than those exempted by rule 345-60-003(2), shall require prior notification to the Energy Facility Siting Council, addressed to Office of the Coordinator, Oregon Energy Facility Siting Council, Salem, Oregon 97310. Notification may be provided by either the shipper or the carrier. However, it shall be the carrier's responsibility to assure the required notification has been provided. This notification shall be made by telegram or registered mail at least five days, not including Saturdays, Sundays, and holidays, prior to shipment. The notification shall include the following information:

(a) Name and address of shipper, carrier, and consignee;

(b) Mode of transport;

(c) Type, quantity and form of radioactive material in each package, and the total quantity in the shipment;

(d) Description of the packaging, including amount and composition of any coolant, and applicable DOT container permit number;

(e) Identification numbers of trucks (both tractor and trailer identification) or trains (both train and specific rail car identification) being utilized in the shipment. It is recognized that in some cases specific identification of tractor, trailer, or rail cars may not be possible. In this event the most complete identification practicable shall be furnished.

(f) Date or dates of movement within Oregon and routes to be followed.

(2) In the event that revisions in the information required by (1)(a) through (f) above occur subsequent to the required notification, the revised information shall be immediately provided by telephone to the Office of the Coordinator, Energy Facility Siting Council.

(3) The Energy Facility Siting Council may, through any authorized representative, designate routes, hours of transport, check points on route, or other safety precautions for shipments requiring notification under these rules.

Stat. Auth.: ORS Ch.
Hist: NTEC 7, f. 2-20-74, ef. 3-11-74

Inspections

345-60-007 Shipments requiring notification under these rules may be inspected by the Energy Facility Siting Council, through any authorized representative, for compliance with applicable rules and regulations.

Stat. Auth.: ORS Ch.
Hist: NTEC 7, f. 2-20-74, ef. 3-11-74

APPENDIX C

REPRESENTATIVE LOCAL NEWSPAPER ARTICLES RELATED TO RADIATION ISSUES AND RADIOACTIVE WASTE MANAGEMENT

Oregon Journal
Portland, Oregon
October 13, 1979

N-plant hearings opened to press

By PAUL MANLEY
Journal Staff Writer

Oregon's Energy Facility Siting Council decided Friday to follow a middle course in open vs. closed deliberations leading to a decision approving or blocking construction of the proposed Pebble Springs nuclear complex in Eastern Oregon.

Urged on one hand to hold all discussions in public and warned on the other that open arguments may provoke emotional outbursts or disruptive actions by the public, the council voted 5 to 1 to allow news reporters to witness all deliberations, whether in open or closed sessions, with the possible exception of those involving security-sensitive matters.

In debate at the council's monthly meeting in Portland Friday, most of the six members present expressed a preference for holding most deliberating sessions in public.

The lone dissenting vote on the adopted plan was cast by Dawn Dressler, who said she would have preferrad a policy calling for all deliberations in public except possibly those involving nuclear security.

The seven-member council expects to begin within the next month a series of discussions of testimony and evidence presented at a hearing that spanned more than a year on the pros and cons of building the proposed $3.5 billion nuclear power plants just south of Arlington in Gilliam County.

Hearings Officer Lowell Bergen last month gave the council his recommendations on some of the subjects on which testimony was required. Among these are plant security, the alleged need for electricity to be generated by the twin plants and the financial ability of the sponsors to build and operate the plants and ultimately decommission them.

Bergen found that the sponsors failed to meet Siting Council standards relating to effects of energy conservation, training for emergency decisions, economic prudence and plant security, but the council is free to disagree with his conclusions.

Sponsors of the two proposed 1,200-megawatt powar plants are Portland General Electric Co., Pacific Power & Light Co., Puget Sound Power & Light Co. and a group of Oregon electric cooperatives under the banner of Pacific Northwest Generating Co.

Siting Council members agreed Friday to start their deliberations with those sections of Bergen's recommendations that are not challenged by any parties to the hearing, "to get our feet wet," as one member phrased it.

Next, they will take up the "least controversial" sections of Bergen's findings that are challenged, and finally those that elicit the most adverse comment.

Objections to parts of Bergen's findings have been presented to the council by the project's sponsors and by Lloyd Marbet and Carl Freedman of the environmental group called Forelaws On Board, who represented the public interest in the hearing.

Marbet and Freedman both expressed dismay at the council's decision to permit closed deliberations on any subject, and PGE Vice President and General Counsel James W. Durham, a former deputy attorney general, urged council members to hold as many deliberations in public as possible.

Brother Raphael Wilson, one of three new members named to the council this year, remarked that, "It's our goal to assure a good quality decision" on whether the nuclear project should be built, and added that there would be times when he would want to reflect calmly on the evidence, indicating that the prospect of public disruptions might interfere.

Siting Council Chairman Walter Evans, a Portland lawyer, and Assistant Attorney General Richard Sandvik reminded council members that Oregon's administrative procedures rules give them discretion to decide whether their deliberations will be in open or closed sessions.

Council Member Marian Frank said she felt it would be "a serious mistake" not to deliberate in public.

While the council debates Bergen's initial recommendations, further sessions of the state's Pebble Springs hearing are planned to consider disposal of radioactive wastes from the project and the effect of last spring's Three Mile Island nuclear plant mishap in Pennsylvania.

The council Friday authorized Susan Garrett of Sheridan to help represent the public interest, together with Marbet and Freedman, in future sessions of the hearing.

Miss Garrett, who holds a law degree, participated last year in federal hearings opposing a proposal to expand the Trojan nuclear power plant's capacity to store spent radioactive fuel at the plant site in Columbia County.

The Pebble Springs project needs federal as well as state permits before construction can begin.

Oregon Journal
Portland, Oregon
October 13, 1979

Ballot on N-plants challenged

MOUNT VERNON, Wash. (UPI) — Puget Sound Power & Light Co. has filed a lawsuit challenging the Skagit County Commission's decision to place on the Nov. 6 ballot a proposition enabling residents a vote on whether they support proposed construction of twin nuclear reactors on the Skagit River near Sedro Wooley.

The proposition is purely an advisory ballot, enabling Skagit County voters to voice approval or disapproval of the proposed nuclear facilities.

Two Portland-based electric utilities are co-sponsors of the proposed nuclear plants. Portland General Electric Co. owns a 30 percent share of the project and Pacific Power & Light Co. a 20 percent share.

Puget Power's suit seeks to halt placement of the nuclear advisory measure on the ballot, said Puget Power attorney Earl Angevine. If that's not possible, he said, the company wants the ballots impounded until a decision on the nuclear plant is made by the county commission.

Filed in Superior Court, the suit claimed the county commission's action was illegal because no state or other authority grants them the power to call an advisory election.

The suit also alleged that taking an advisory ballot at a time when the commissioners are required to judge the Skagit nuclear power project on its merits would prejudice the commissioners' decision and violate Puget Power's constitutional guarantee of due process.

Angevine said that although the decision to file the suit was not expected to be a popular one, the company had no choice but to protect itself and its customers from further delays and added costs to build the nuclear plants.

Oregon Journal
Portland, Oregon
October 15, 1979

jack anderson

N-probe is shocking

WASHINGTON — A still-secret report by a presidentially appointed blue-ribbon commission investigating the nuclear disaster at the Three Mile Island power plant near Harrisburg, Pa., is bound to throw new fat in the firefight raging between proponents and enemies of nuclear power development.


Anderson

Anti-nuke protesters, such as those who recently stormed the barricades of the Seabrook, N.H., nuclear facility, have made it clear they don't intend to forget the near-catastrophic fiasco at Three Mile Island, which held the entire nation in frightened suspense for six days last March.

Nuclear power's staunchest defenders, including Jimmy Carter, have attempted to soft-pedal the health and safety hazards of building more nuclear power plants. But the highly confidential findings of the presidential commission, headed by Dartmouth president John Kemeny, prove that Americans were fortunate that the Three Mile Island accident wasn't worse, or didn't happen sooner.

Kemeny and his fellow commissioners will report to the White House later this month. But we've had access to their preliminary eyes-only conclusions, which are certain to change the way the nuclear industry is regulated.

Basically, what the investigators found was that, at least at Three Mile Island, the nuclear power industry is being run by people who don't know what they're doing — or don't care. Here are just a few of the shocking deficiencies the Kemeny Commission's investigators turned up:

— The Three Mile Island fiasco was caused primarily by the inability of the operators, engineers and plant supervisors to recognize the mechanical failure when it occurred. "This demonstrated a lack of fundamental understanding of the plant design and operational characteristics under normal and abnormal conditions," say the secret findings.

— Qualifications for licensed nuclear plant personnel are incredibly lax. There are no minimum requirements on education or psychological fitness for reactor operators, supervisors and plant managers — whose expertise and state of mind can mean the difference between safety and nightmare for millions. One Nuclear Regulatory Commission official recalled licensing an individual who didn't have a high school education. Incredibly, there's not even a requirement that applicants with criminal records be screened out.

— Training programs are run by the utilities with virtually no supervision by the NRC. The programs run by the firm that designed Three Mile Island's reactors, for example, haven't been audited since 1968, and that audit didn't evaluate the contents of the program, just the exam results. Classroom attendance is not monitored by the NRC. Files of past NRC licensing exams are kept by the utilities as guides for trainees, one Kemeny commissioner told our reporter Christoph Szechenyi.

"The resulting picture is one of training programs of which the NRC is largely ignorant, followed by examinations which are routinely passed without meaningful evaluation," concluded the commission's staff investigators.

— The industry and the regulatory commission failed to heed the warnings implicit in earlier accidents, both in this country and abroad, yet a pattern of probability was clearly discernible. For example, an accident — similar to Three Mile Island's, but less serious — occurred in 1974 at a nuclear power plant in Beznau, Switzerland, involving American-made equipment. But the incident was never reported to the NRC, because the law requiring American firms to report reactor-related accidents wasn't passed till two months later.

Even now, under mutual information agreements with 18 nations, the information the NRC gets from overseas is often "well laundered" to minimize seriousness, according to an NRC official.

— Warnings from knowledgeable, conscientious inspectors and scientists are shrugged off by those with the power to correct potentially dangerous situations. NRC inspector James Cresswell, for example, tried in vain for two years to get his superiors to do something about deficiencies at the David Besse nuclear plant near Toledo, Ohio — shortcomings that foreshadowed Three Mile Island. And a Tennessee Valley Authority scientist had spotted a major safety problem related to the malfunction that occurred at TMI — but his information was lost in the shuffle until after the nuclear mishap that shook the world.

— Poor design made some vital information in the reactor room inaccessible. Malfunctioning equipment was slow to be removed or repaired, and Three Mile Island management was lax in modifying operations and emergency procedures. "One must conclude," the report states, bluntly, "that the oversight of both the utility and the NRC was clearly deficient in permitting these deficiencies to go unattended."

Kemeny's probers, curiously, wrote off the health hazard to those exposed to Three Mile Island's radioactive fallout with the phrase "probably no detectable long-term delayed health effects." And it notes that "only three workers . . . were exposed to slightly higher radiation doses than considered safe, but even those doses were not sufficient to cause any acute injury."

Yet the investigators admitted that scientists are uncertain about the long-term effects of low-level radiation.

Oregon Journal
Portland, Oregon
October 15, 1979

N-plant poses no danger

PLATTEVILLE, Colo. (UPI) — A preliminary investigation indicates no measurable radiation escaped during an equipment failure that shut down the Fort St. Vrain nuclear generating plant for the third time in less than two years, a federal inspector said Monday.

"The plant already is back in stable condition," said Maynard Dickerson, the on-site U.S. Nuclear Regulatory Commission inspector assigned to the plant 40 miles east of Denver. He also said no full scale NRC investigation is planned.

Dickerson said the shutdown occurred at 7 a.m. Sunday when helium, the primary coolant used at the facility, seeped into a backup water system, apparently through a malfunctioning valve.

"It's just a matter of fixing a valve. The plant could be operational again as soon as Tuesday after I complete an inspection of repairs," Dickerson said Monday.

It was the third shutdown of the plant in less than two years due to equipment failure and the second resulting from a helium circulator system malfunction.

Fort St. Vrain, which opened in 1976, is the first nuclear power plant built in Colorado. It employs a high-temperature, gas-cooled reactor.

Oregon Journal
Portland, Oregon
October 16, 1979

5 N-foes occupy Atiyeh's office

SALEM — After the arrest of four anti-nuclear protesters Monday, five more began what they said would be a day-long campout in Gov. Vic Atiyeh's office Tuesday, repeating their demands that the Trojan nuclear power plant in Rainier be shut down permanently.

The protesters, members of the Trojan Decommissioning Alliance, sat in the governor's ceremonial office and talked with reporters as a plainclothes state trooper looked on from across the room.

Atiyeh did not immediately emerge from his inner office to talk with protesters or reporters, but press secretary Denny Miles said, "The governor will make an effort to talk to them sometime today, if they are willing to wait."

Asked what the governor was doing at the moment, Miles replied, "He's catching up on spending two weeks out of the country (a Far East trade mission)."

One of the protesters, James Mason of Portland, said, "We will not leave Gov. Atiyeh's office voluntarily unless he orders an immediate, permanent deactivation of Trojan."

Oregon Statesman
Salem, Oregon
October 16, 1979

Governor's office target for protest

SUE HILL
Oregon Statesman Reporter

Anti-nuclear protesters said they will move their demonstration to the governor's office this morning in the second day of a sit-in campaign aimed at forcing permanent closure of Oregon's only nuclear power plant.

Four members of the Trojan Decommissioning Alliance were forcibly carried from the state Department of Energy Monday evening by Oregon State Police after they refused to leave at closing time.

The quartet sat in the energy office all day, vowing to stay there until Trojan nuclear power plant was closed by the state.

Julie Levak, 18, Janet Saybor, 30, Ted Whitney, 26, and Robert Feinberg, 20, all of Portland, were booked on charges of criminal trespass.

All except Levak, who is awaiting trial on a similar criminal tresspass charge stemming from a July 10 protest, were released on their own recognizance, corrections officials said. Levak was released after posting $40 security.

The maximum sentence for criminal trespass is $250 or 30 days in jail.

The four protestors refused to accept simple citations, thereby forcing state troopers to haul them physically out of the Labor and Industries Building before a cadre of reporters who outnumbered the protestors 4-1.

"It's obviously all staged for the benefit of the media," said one Energy Department staffer who milled around watching the gaggle of reporters and cameramen milling around just prior to the 5:30 p.m. office closing.

Gov. Vic Atiyeh told a news conference earlier in the day that he will talk to the demonstrators for a limited time today, as his schedule allows. He said they will be welcome so long as they are orderly and don't disrupt or interfere with others in the office.

"I'm not interested in confrontation," Atiyeh said. "They may be but I'm not."

Atiyeh said earlier his office will be open to the demonstrators until the end of normal business hours but if they do not leave at 5 p.m., they will be escorted out.

Oregon State Police Trooper Mitchell Southwick, left, and Cpl. John Morris drag Trojan Decommissioning Alliance demonstrator Julie Levak, 18, of Portland, from the state Department of Energy offices Monday.

Statesman photo by DeeAnn Hall

C-7

Oregon Statesman
Salem, Oregon
October 17, 1979

Jury convicts N-saboteurs

SURRY, Va. (AP) — Two self-professed saboteurs were convicted Tuesday of damaging a nuclear power plant in what was believed to be the first trial in the nation involving the sabotage of a nuclear facility.

The jury returned guilty verdicts against the former Surry nuclear plant employees after deliberating for about three hours. The two men had admitted pouring a caustic chemical on fuel rods at the plant, saying they wanted to draw attention to what they said are lax safety standards.

Virginia Electric & Power Co. has estimated damage to the plant at $1 million.

Convicted on single felony counts of damaging a public utility were William Kuykendall, 26, of Newport News, and James Merrill, 24, of Hampton.

The jury recommended the minimum sentence — two years in prison — but the judge need not accept the jury recommendation. The maximum sentence for the offense is 10 years behind bars. The judge set sentencing for Nov. 27. Both men are free on bail.

Kuykendall and Merrill plan to appeal the convictions to the state Supreme Court.

"It doesn't end here. I have faith in the justice system," Kuykendall said. Asked if damaging the plant was worth the possibility of going to prison, he responded, "If it ultimately accomplishes my objective, yes, it will have been worth it."

But Merrill said, "No, at least I don't think so."

Kuykendall and Merrill, former control room operator trainees at the nuclear plant, admitted they sabotaged the fuel rods April 27. They said they did so to dramatize what they regarded as lax security and unsafe working conditions at the plant.

Kuykendall and Merrill testified Monday that they had complained in vain to the company about conditions at the nuclear power plant before deciding to damage the stored fuel rods.

"I did it to shock my employer into action that he had not taken previously on his own accord," said Kuykendall. "I did not want to hurt anyone."

The utility discovered the damage to the fuel rods in early May and began a search for the saboteurs. But Kuykendall and Merrill came forward to admit their complicity in June, before an arrest was made.

The men had used Kuykendall's "key," a coded plastic card, to gain access to a fuel storage building, separate from the nuclear containment building.

They carried five gallons of sodium hydroxide into the restricted area, and Kuykendall said later that a security guard had walked through the area while they were sabotaging the rods.

Oregon Journal
Portland, Oregon
October 24, 1979

'It can happen here,' Trojan warned

By SPENCER MEINZ
Journal Staff Writer

RAINIER — The federal Nuclear Regulatory Commission told local government officials at the Trojan nuclear plant Wednesday that a nuclear accident can happen, and asked their help in preparing the public for such an emergency.

"All the ground rules have changed," since the release of radiation last March at Three Mile Island, Tom McKenna, team leader of a five-man NRC task force, told about 50 persons in the Visitors Center auditorium at the Trojan plant. "You've got to have a full bag of tricks to protect the public as best you can."

The NRC asked local and state officials to make a "good-faith effort" to help Portland General Electric Co. improve the emergency response plans within a 10-mile radius of the plant, which is 5 miles south of Rainier.

Some of the officials balked at the possible time and expense involved.

But the NRC said the public must be made aware that the first response in a nuclear accident should be to take immediate shelter, to turn on the radio and to await further instructions.

The NRC told officials that the public within 10 miles of the plant should be notified within 30 minutes of an accident involving radiation release.

"There are certain circumstances," McKenna said, "in which the plume (of radioactive gas) would get out of here and blow down the river so fast you wouldn't believe it."

He stressed that the likelihood of a nuclear plant accident is no greater than in past years. But he said the accident at Three Mile Island has illustrated the need for anyone within a 50-mile radius of a nuclear plant to be aware that the worst can happen.

The NRC said PGE, as the licensee of the plant, is responsible for coordinating emergency response efforts among local jurisdictions, but that it would be in the best interests of everyone within the emergency response area of the plant to learn to work together.

The NRC said PGE has until Dec. 3 to provide an expanded and improved emergency response plan in order to comply with freshly proposed NRC regulations.

Donald W. Godard, siting and regulation administrator for the Oregon Department of Energy, complained that the NRC task force seemed to be pushing itself upon the local jurisdictions rather than attempting to work with them.

"Don't come here and tell us what to do," Godard said. "Come here and talk to us. You're in this as much as we are. Come in and join us in the water."

McKenna said the existing emergency response system in the area of the Trojan plant is "one of the best I've seen."

But he said the response plan here, as elsewhere in the country, needs substantial improvement. . .

Weld faults stall Hanford N-plant

RICHLAND, Wash. (UPI) — Repair work won't begin for at least a month on many defective welds discovered in a concrete and steel shield around a reactor under construction at the Hanford No. 2 nuclear power plant, a Washington Public Power Supply System spokesman said Wednesday.

Between 10 and 40 percent of the welds on the 1,000-ton shield are "visually defective," and some welds are missing altogether, according to a Nuclear Regulatory Commission report.

The defects, discovered about five months ago, have been the target of a team of engineers attempting to develop a plan of action to repair them, said WPPS spokesman R.F. Nowakowski. The power supply system engineers are finishing the complex inspection and evaulation of the defective welds, he said.

"Right now, our engineers are still developing a plan of action," he said. "We expect that to take a month to complete."

Nowakowski said voids were found in what was supposed to be the 2-foot-thick concrete center of the shield. Water was found ponding in the concrete.

The shield was completed two years ago under an $8 million contract with Lockenby Co. of Seattle.

The power plant, a "boiling water reactor" in which steam is carried off to a generator and recycled through the reactor, is expected to begin operation in 1981.

Meanwhile, in Seattle, regulatory commission officials say new geologic evidence showing the proposed site for the Skagit Nuclear Project may lie on a potentially dangerous earthquake fault could mean a serious delay for the project, a Seattle newspaper reported Wednesday.

In a copyrighted article in the Seattle Post-Intelligencer, NRC officials were quoted as saying the controversial $3.8 billion project is unlikely to get federal approval to start construction before its local zoning permit expires Dec. 31.

"It's looking very unlikely a limited work authorization will be issued. In fact, it's nearly impossible," said NRC attorney Richard Black.

The statements came just one day after a Skagit County Superior Court judge denied a motion filed by Puget Power Sound & Light Co., the sponsor of the project, to remove a citizens' advisory referendum ballot on the issue from the Nov. 6 general election.

NRC officials said Tuesday the new geological evidence concerns a fault beneath the San Juan Islands, west of the project site, which is near Sedro Woolley on the Skagit River. The fault "trends in the direction of the site," said James Knight, the commission's assistant engineering director.

Aides to U.S. Rep. Al Swift, D-Wash., said they had been told the fault is "active" — meaning it could cause earthquakes — by Robert Morris, chief of nuclear site review investigation for the U.S. Geological Survey, the agency which only a few months ago had given the twin-nuclear project a green light.

The Post-Intelligencer said Morris, when contacted, would not confirm or deny whether the fault could cause tremors.

Oregon Statesman
Salem, Oregon
October 19, 1979

Need for N-power stressed in drive

A nationwide campaign in favor of nuclear power started Thursday, according to members of Nuclear Energy Education Day (NEED).

The program, involving informal discussions with nuclear industry spokesmen across the U.S., is sponsored in Oregon by Oregon Women's League, Nuclear Energy Women and Women and Energy.

"Nuclear power is a highly misunderstood, unnecessarily scary subject — especially to women," said Harriet Beers, president of Oregon Women's League. "Yet it is a vital energy source that is indispensable to the labor and time-saving devices that have helped free women from household chores."

More information is available from Beers, of Beaverton, 649-9802.

Oregon Journal
Portland, Oregon
October 19, 1979

Nuclear true confessions

After Three Mile Island, what?

The electric utility industry's answers to that question, outlined at a press conference sponsored by Portland General Electric Co. this week, make excellent sense, at least as far as they go.

One only wonders why the steps had not been taken long ago.

After the accident last March 28, when the nuclear power reactor at Three Mile Island near Harrisburg, Pa., threatened to run out of control, the electric power industry formed a committee to study what lessons should be learned from it.

The main recommendation so far, as described at the meeting presided over by PGE's board chairman, Frank M. Warren, this week, is creation of an Institute of Nuclear Power Operations (INPO). It will be run by the operators of nuclear power plants, public and private. Its job will be to develop and if possible to enforce "benchmarks of excellence" for the operation of those plants.

Today there is "a wide disparity in the quality of operation" of nuclear plants, said A. J. Phister, general manager of the Salt River nuclear project in Arizona, one of the participants in the industry's post-mortem to Three Mile Island.

The institute, which is scheduled to be in business by early next year, will train and test the employees who operate nuclear plants, and the executives who hire and supervise them.

It will record and analyze the relatively little things that go wrong in nuclear plants, to try to see that they don't build up into major accidents. It will share information among nuclear operators worldwide.

It will audit the operation of each nuclear plant periodically, to see that it is meeting the best available standards.

It will maintain a national inventory of experts and special equipment, ready to rush them to the scene of a nuclear accident.

What? Haven't these things been done right along? No, said Warren and his colleagues.

In addition to forming INPO, the industry is talking of organizing an insurance pool. It would help the power system which might suffer a prolonged outage from damage to a nuclear plant to pay for the replacement power it would need until the plant could be put back in service. Without such help, the local ratepayers have to pay the whole cost, and in the case of PGE's Trojan plant, that cost runs $700,000 to $900,000 a day, Warren said.

By implication, the insurance is a weapon INPO would use to force individual utilities to maintain high standards: Get sloppy, and you're out of the pool.

Some of the lessons of Three Mile Island, as recited by Warren and his colleagues, must be bitter for the industry — and they should be for the public as well:

- The industry needs an independent source of technical information, separate from the manufacturers who sell the utilities their nuclear equipment. Of course! Didn't anyone think of that before?
- The industry was wrong in thinking that if it did everything the federal Nuclear Regulatory Commission told it to do, it had done all it needed do. What an indictment of the federal regulators who, the public thought, were assuring the safety of nuclear plants!

A glaring omission from the plans for INPO are that it is not presently programmed to help find a way to dispose safely of the radioactive wastes a nuclear plant produces. This failure, which the federal government also shares, will remain the Achilles heel of the nuclear industry until it is solved.

Traumatic as it was, Three Mile Island could have its beneficial side if it does awaken the industry and the public to such reforms as Warren and his associates have described. We need the energy that nuclear plants can provide.

But why has the barn door been left open so long?

Oregon Journal
Portland, Oregon
October 23, 1979

N-medicine hurt by dump closure

CARSON CITY, Nev. (UPI) — The closure of a nuclear waste dump in Southern Nevada could force thousands of hospitals, research centers and industries across the nation to stockpile their own radioactive materials, a spokesman for Gov. Robert List said Tuesday.

"This is definitely something that will have a national impact," said Bill Phillips, news secretary for List, who ordered the burial grounds in Beatty closed because of safety violations.

George Kolbenschlag, assistant to the president of Nuclear Engineering Co., of Louisville, Ky., which operates the dump, said the shutdown could limit such things as future cancer research, metallurgical work and hospital treatment. He said private industries don't have the facilities to store their own wastes. "This is a national problem," said Kolbenschlag.

The 12,000-member Society of Nuclear Medicine, based in New York City, asked List to allow radioactive materials from hospitals and laboratories to continue to be buried at Beatty until an alternative site can be found. The closure, said Dr. Leonard Freeman, society president, of New York City, "creates an immediate crisis for nuclear medicine and for thousands of Americans who need its vital services."

The actual closure was supposed to be Tuesday but was delayed until Wednesday to allow trucks already en route with the waste to dispose of it. There are only three commercial burial grounds in the nation — at Beatty, in Hanford, Wash., and Barnwell, S.C.

Washington Gov. Dixy Lee Ray has suspended operation in her state because improperly packaged waste was being transported to the site. And South Carolina has limited the amount of radioactive materials it will accept.

List, described as "very irritated" at the recent developments in Beatty, ordered the suspension of the license of Nuclear Engineering. List moved last month to revoke the license permanently, but a hearing on that action before the state Health Board is not scheduled until Nov. 27.

In the latest development, at least four barrels of radioactive waste were found buried outside the dump.

Oregon Journal
Portland, Oregon
October 23, 1979

3 Mile Island probe 1 vote short of N-ban

WASHINGTON (UPI) — The president's Three Mile Island commission, in closed meetings last weekend, fell short of the absolute majority needed to recommend a moratorium on construction of new nuclear reactors, it was reported Tuesday.

The New York Times said two unidentified commission members told it that six of those voting supported the step, while three or four opposed it, after intense debate at a final series of meetings.

But the proposal to halt construction of new reactors did not become a formal recommendation because a procedural rule adopted on Saturday requires an absolute majority — seven votes — of the 12 commissioners for such recommendations, it said.

An NRC representative had no comment Tuesday on the newspaper report.

The Times also said it had obtained an Oct. 17 draft of the commission's final report, which is due to be submitted to President Carter early next week, and learned that the final version virtually is unchanged.

According to the paper, the commission concludes in its final draft report that the utility that operated the reactor "did not have sufficient knowledge, expertise and peronnel to operate the plant or maintain it adequately."

The commission found that the total cost of the Three Mile Island reactor accident, including restoring the plant and providing alternative electricity, would be high, ranging from $1.047 billion to $1.858 billion.

The draft report also was critical of the companies that made and designed the reactor. And the report charged the federal regulatory agency was preoccupied with licensing reactors, not assuring their safety, and lacked a system "to measure and improve the quality or safety regulations."

The commission headed by John Kemeny was set up by President Carter last spring after the March 28 accident at the Three Mile Island nuclear plant in Pennsylvania. It is one of six groups examining the incident and its consequences.

The Times said the commission's formal recommendations included the following:

- That the five-member Nuclear Regulatory Commission, an independent federal agency, be abolished and replaced by an agency in the executive branch with a single director appointed by the president and confirmed by the Senate.

- That reactor operating licenses be subject to periodic renewal after an open and public hearing on the performance of the operating utility.

- A variety of changes in the qualification of reactor operators, their training, the organization of reactor control rooms and the intensity and direction of government regulation. At present, many aspects of reactor safety are left to the discretion of the companies that design and manufacture reactors and the utilities that operate them.

Oregon Journal
Portland, Oregon
October 23, 1979

Bid for hearing on Trojan upheld

SALEM — Oregon's Energy Facility Siting Council must hold a hearing that could result in revoking or suspending the state permit to operate the Trojan nuclear power plant, the Oregon Court of Appeals ruled Monday.

The court said the hearing must be held to consider the site certificate issued for the plant, near Rainier.

Two Portland Democrats, state Sens. Jan Wyers and Ted Hallock, asked the Siting Council for a contested case hearing on the certification of Trojan, a request the council denied.

Wyers and Hallock then took the matter to Multnomah County Circuit Court, where Judge Charles Crookham found against the council, a ruling it appealed.

In upholding the lower court's ruling, the appeals court said that under the council's own rules, it is required to hold a hearing as requested by Wyers and Hallock.

The lawmakers want the hearing to suspend or revoke Trojan's site certificate. They contend Portland General Electric Co. is storing more spent fuel rods — and for longer periods of time — than specified in its site certificate, which also is a violation of a state law that prohibits establishing a waste disposal facility for radioactive materials in Oregon, the lawmakers contend.

State law, said the court, requires that a site be used according to its site certificate.

State law also allows a waiver of that requirement by the council, but only after a public hearing. And, according to Wyers' and Hallock's complaint, "No such hearing has been held and the owner is not utilizing Trojan in accordance with its site certificate."

"A hearing must be held," the court added.

Oregon Journal
Portland, Oregon
October 24, 1979

S. Carolina N-dump restricted

United Press International

South Carolina, the only state accepting low-level nuclear waste, has announced it will bar any shipments of radioactive materials originally intended for recently closed dumps in Nevada and Washington state.

In Nevada, Gov. Robert List said Tuesday that he is going ahead with the shutdown of the state's nuclear dump site — one of only three in the nation — despite mounting pleas from hospitals and research centers to keep it open.

Nevada's trouble-plagued dump in the desert near Beatty was ordered closed late Monday by List after four radioactive barrels were found buried outside the property.

List also criticized President Carter, saying he is more interested in politics than in developing a national policy for the disposal of the nuclear garbage.

Oregon Journal
Portland, Oregon
October 25, 1979

Brown's pledge to shut N-plant draws cheers

DURHAM, N.H. (UPI) — California Gov. Edmund G. Brown Jr. brought cheers from 800 students at the University of New Hampshire Wednesday by pledging to shut the $2.6 billion Seabrook nuclear power if he's elected president.

news scope

The Seabrook plant, now under construction, has been the target of repeated anti-nuclear demonstrations for the past three years. More than 2,000 protesters tried to storm the gates to the coastal plant earlier this month, but were repulsed by police and National Guardsmen.

Brown, an unannounced candidate for the Democratic presidential nomination, repeated his call for a halt to construction of new nuclear plants and pledged that he will block the government from issuing a license for the Seabrook plant if he's elected.

Oregon Journal
Portland, Oregon
October 25, 1979

Trojan exercise taken seriously

By PAUL MANLEY
and SPENCER HEINZ
Journal Staff Writers

Three hours into Thursday's practice drill for a Trojan power plant emergency, the dozen or so state officials and technicians staffing the governor's command post suddenly realized that no one had remembered to order a pot of coffee.

That's how seriously the exercise was taken in the crowded room in a corner of Portland's State Office Building where Gov. Vic Atiyeh huddled with representatives of Portland General Electric Co. and Oregon's Health Division, Energy Department and the State Police.

The same group was scheduled to meet again Friday, this time at the Trojan Visitors Center, to evaluate Thursday's drill and discuss where improvements might have been made if the "disaster" had been real.

THE "ALERT" that reached the governor's office in Salem at 10:08 a.m. was not as much of a surprise as had been planned. For weeks PGE, state and county emergency services agencies had been planning a test of Trojan's emergency plan for the week of Oct. 22, but the exact date was supposed to be a secret.

As it happened, the Trojan Decommissioning Alliance — which wants Trojan put out of action permanently — got word of the date and relayed the information to the news media.

In that way the governor, too, found out which day he was going to be called on to make decisions about "evacuating" residents around Trojan, but he said he didn't know the exact timing of the exercise until State Police notified his office of the alert four minutes after it was received at police headquarters in Salem.

The four-minute delay was necessary, the governor explained, for the State Police to verify that the alert was "real."

CONTRARY to expectations when plans for the drill first were drafted, the exercise had to be conducted while Trojan was out of action, with the nuclear reactor shut down so that repairs could be made this week to a pair of leaking steam turbines.

For that reason, the situation at the governor's command post became a bit unreal when reports came in indicating that a control rod had broken and radioactive gas had been released into the air.

At the Trojan plant, 5 miles south of Rainier, the exercise began at 9:59 a.m. when control room workers received an envelope that contained the scenario.

Control room personnel phoned the attendant at the nearby Visitors Center public information desk, and she announced over the public address system that an accident had occurred.

SIRENS sounded and plant managers drove cars to the Visitors Center auditorium, which would serve as a command and strategy center for the site in an actual emergency.

Within five minutes, they were seated at a table with 11 telephones hooked into a central, portable phone jack.

They evaluated scenario data and fed it to emergency agencies in the area.

Command personnel kept a running timetable posted to the wall of radiation readings, evacuation times and ambulance arrivals.

Ambulance personnel removed a worker who, according to the scenario, had bumped his head while trying to escape the "containment" area of the plant. He was admitted to Good Samaritan Hospital.

Another worker, supposedly exposed to radiation, was led through the decontamination chamber and driven to Good Samaritan in a Portland General Electric Co. car.

A U.S. ARMY National Guard helicopter landed outside the Visitors Center. In an actual emergency, PGE spokesmen said, the craft would be dispatched to follow the plume of radioactive gases.

Dave Eagon, a PGE public information officer, said the test was worthwhile despite criticism from some antinuclear groups that the date of the test was generally known earlier in the week.

"But people at the plant didn't know exactly what time of day it was going to happen," Eagon said. "And they didn't know the scenario until they got the envelope."

Tom McKenna, leader of the federal Nuclear Regulatory Commission task force that observed the entire test, said as it progressed that the response by Trojan and area governments seemed well-coordinated.

"I SEE a lot of positive things," he said.

"One of the things we wanted to determine was whether they had the ability to immediately locate an aircraft" to observe the plume.

"The helicopter was here right away. The crew was on the ball. They seemed to know just what to do."

In Washington's Cowlitz County, directly across the Columbia River from Trojan, residents were advised to evacuate from the city of Kalama and the Green Mountain area. They were advised to head for the Lewis River region if a real emergency developed.

The simulated accident, Atiyeh explained, involved a broken rod in Trojan's reactor that allowed steam to escape (an event that was impossible, because the plant was shut down and no steam was being generated).

"An amount of steam has escaped outside the plant," Atiyeh continued, keeping a perfectly straight face and acting for all the world as if the most serious crisis of his term in office was really happening.

THE FIRST hint that the situation was anything less than a practice exercise came when Atiyeh used the words "evacuation drill" to describe what the Columbia County sheriff's office was initiating within a 2.5-mile radius of Trojan.

"We've just received word that they're asking that evacuation be extended to 6 to 7 miles (from Trojan)," the governor continued. "We'll let you know our decision on that."

For the next 2½ hours, Atiyeh smoked cigarette after cigarette as reports poured into the command post from Trojan, from Health Division teams checking radiation levels at various distances from the plant, from the Columbia County emergency services office in St. Helens and the Cowlitz County office in Kelso, Wash.

AS TELEPHONES rang, Health Division and Energy Department officials automatically answered "Decision Center" as if they did it every day.

The governor insisted on being briefed about the subject of every phone communication and having technical details "translated" by technicians familiar with radiation and nuclear generators.

Oregon Journal
Portland, Oregon
October 25, 1979

Trojan emergency response tested

By PAUL MANLEY
Journal Staff Writer

A test was staged Thursday of emergency responses in the event of a radioactive accident at the Trojan nuclear power plant.

The four-hour test began at 9:59 a.m. with emergency teams from Columbia County in Oregon and Cowlitz County in Washington participating in the exercise.

Gov. Vic Atiyeh's office in Salem was notified at 10:18 a.m. that a simulated accident had occurred. The accident supposedly involved the breaking of a fuel rod, which released radioactivity into the atmosphere.

Atiyeh immediately boarded a helicopter and flew to Portland, where he arrived at 11:30 a.m. at a command post set up in the State Office Building. Meantime, officials and technicians of the Oregon Health Division and the State Department of Energy were too busy to brief reporters on the extent of the supposed radiation release or evacuation activities.

After Atiyeh arrived and was briefed on the situation, he told the waiting reporters that the amount of radiation escaping outside the plant was between one and five rems, explaining that five rems would equal the yearly radiation dose to an average Trojan employee.

The annual test is conducted as a requirement of Portland General Electric's operating license for the nuclear plant near Rainier to show what measures would be taken to protect the public in case of a nuclear accident.

Juanita Gibson, secretary of John T. DeFrance, director of emergency services for Columbia County, said their first notification of the mock accident was received at 10:13 a.m.

That call, she said, was received through the county's central dispatch network, and "at about 10:20 a.m. we were advised to activate our emergency response plan.

"The call came from Trojan," she said. "Our orders were to evacuate the 1½-mile radius around Trojan — about 600 persons." Atiyeh announced at 11:30 a.m. that a recommendation was received to expand the evacuation radius to six or seven miles around the nuclear plant.

Ms. Gibson said police went door to door in the area, handing out evacuation instructions, although in reality nobody was actually evacuated.

She said PGE reported the "accident" involved "a high release of radiation on their '6' monitor. I don't know what that means."

The people "evacuated" were instructed to go to schools in Clatskanie and Scappoose, Ms. Gibson said.

"If at all possible, they were to use their own transportation," she said.

Ms. Gibson said that in a real emergency, National Guard vehicles and school buses would be used in an evacuation. These vehicles were placed on alert Thursday but not actually sent out.

Persons living in Cowlitz County, Wash., just across the Columbia River from Trojan, also were advised to evacuate in the simulation. Longview, the county seat of Cowlitz County, is the largest city closest to the nuclear plant.

All persons in Southwest Washington were told to tune their radios to 1270 on the AM dial to listen for any emergency announcements.

As the make-believe exercise was carried on, PGE announced that an actual, current shutdown of Trojan is expected to continue for one to two weeks.

PGE earlier planned to have maintenance and repair work completed by this week and the plant back in operation early next week.

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Council takes first step toward N-plant decision

By PAUL MANLEY
Journal Staff Writer

Oregon's Energy Facility Siting Council took the first step Friday down a long road toward final action on a proposal pending for nearly a decade to build two nuclear generators at Pebble Springs in Gilliam County.

With no debate, the six members present at a meeting in Portland agreed that the four utility companies sponsoring the project have proved they will make the utmost practical use of any byproducts or wastes generated by the nuclear project if it is built.

There was no argument on that subject from foes of the Pebble Springs project who participated in state hearings that spanned more than a year.

"We have one (issue) out of the way," exclaimed Council Chairman Walter Evans triumphantly as the motion passed unanimously.

Beneficial use of wastes was one of four "uncontested" subjects to be debated Friday by the Siting Council. Friday's session was the first of many planned by the council for the coming year to review upwards of 20 subjects on which testimony was presented at the hearing.

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'Decision center' rapped on N-drill

By SPENCER HEINZ
Journal Staff Writer

RAINIER — A spokesman for a federal agency Friday criticized the effectiveness of the state "decision center" office in Portland during the mock disaster drill Thursday involving a supposed release of radiation from the Trojan nuclear power plant near here.

"When it comes to making decisions, it appears that no decisions were being made at the state decision center," Dick Donovan, a spokesman for the federal Emergency Management Agency, told a packed auditorium during a critique session at the Trojan Visitors Center.

The decision center "ceased to function when the governor arrived. It simply shut down for 45 minutes," Donovan declared.

Donovan's reference was to confusion created when Gov. Vic Atiyeh arrived by helicopter from Salem to take charge of the decision center in the State Office Building about an hour after the drill began at 10 a.m.

The thrust of comments by a panel of expert observers was that the drill had been a success from the standpoint of illustrating a number of deficiencies.

The observers said the drill had been helpful in showing better ways to provide for an emergency in the future.

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Three Mile 'fallout': Portlanders may pay

By PAUL MANLEY
Journal Staff Writer

Portland General Electric Co. — and its ratepayers — are going to feel effects of last spring's Three Mile Island nuclear mishap for some time to come.

Even though the most serious nuclear power plant accident in U.S. history occurred six months ago in Pennsylvania, its impact will be noticed for years in Oregon and elsewhere in the nation, two utility industry spokesmen indicated Tuesday in Portland.

A.J. "Jack" Pfister, director of the Salt River nuclear project in Arizona, and Joe Prestele, nuclear operations specialist for the Electric Power Research Institute, described cooperative steps being taken by the utility industry to reduce chances of future nuclear mishaps and to protect the public and the utilities against the consequences of any that do occur.

With Portland General Electric Co. Board Chairman Frank M. Warren, they spoke to news reporters and invited representatives of the public in PGE's Willamette Center auditorium.

Warren said PGE is planning to participate in a proposed insurance pool that would cover part of the cost of replacement electricity purchased during a long outage of a large generating plant.

Metropolitan Edison Co., the utility that owned the stricken Three Mile Island plant, still out of commission, has had to pay more than $20 million a month for power to replace the output of the shutdown project.

Warren estimated PGE's share of the insurance "premium" would be $1 million to $2 million a year. "We might have to contribute to (solving) their problems and they'd contribute to ours," he said, referring to other utilities that would participate in the pool.

Asked whether that expenditure was reasonable for his company, Warren replied that he considers it a good investment because a one-day outage for PGE's Trojan nuclear plant may cost $700,000 to $900,000.

The PGE chairman noted that the utility industry insurance plan is still being drafted, but said he felt the company likely will need the Oregon public utility commissioner's approval to participate.

"I think we would get that approval," Warren added. "If we did not, I think we would consider (participating) anyhow," meaning that PGE would pay the insurance premium out of earnings if it couldn't be justified to the PUC as a business expense.

"But we think it's a very proper expense," Warren stressed.

(Continued on page 11)★

Oregon Journal
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★Three Mile 'fallout': Portlanders may pay

(Continued from page 1)

Pfister estimated PGE's yearly contribution will be $150,000 to the Institute of Nuclear Power Operations (INPO) being organized by U.S. utilities operating nuclear generators to improve exchanges of information and techniques in the nuclear energy field.

He said one lesson learned from Three Mile Island is that "there is wide disparity in the operation of nuclear power plants."

The new INPO will "seek out the most effective training techniques (for nuclear plant operators) and the best operating programs and make them available to all" utilities, Pfister explained.

Prestele said the Electric Power Research Institute is continuing its own analysis of the Three Mile Island mishap, including an "epidemiological study" continuing for many years to determine what effects, if any, the radioactive emissions will have on residents of the area around Harrisburg, Pa.

EPRI, a research and development organization funded by electric utilities, also is putting together a team of experts to evaluate minor malfunctions at all nuclear generators to see whether they provide clues to prevent future major mishaps.

If another accident like Three Mile Island occurs, Pfister said, the utility company operating the plant will be able to obtain from industry sources, through INPO, the equipment and expert manpower needed to cope with the problem.

Warren said some U.S. Nuclear Regulatory Commission officials feel their task is too big for the size of their work force, so they welcome help from the utility industry in improving procedures and exchanges of information.

"The utility operating the (nuclear) plant has to be responsible for what happens there," the PGE chairman said.

He said financial effects of the Three Mile Island mishap on Metropolitan Edison Co. "give the greatest motivation" to all utilities to operate nuclear generators as expertly as possible.

Any time a disaster of Three Mile Island scope occurs, "the entire nuclear industry is in danger," Pfister commented, explaining the industry's concern for preventing a repetition.

He said the accident "has been costly in terms of public support."

Warren is one of eight members of a national utility industry committee studying effects of Three Mile Island.