

TERA

JUN 27 1980

Docket No. 50-10

The Honorable Paul Laxalt
United States Senate
Washington, D. C. 20510

Dear Senator Laxalt:

This is in response to your letter requesting our findings and views on a letter by your constituent Kelly Masterson of the Sagebrush Alliance, about the chemical decontamination of Dresden Nuclear Power Station Unit No. 1.

The Masterson letter expresses concern related to 1) the potential for migration of nuclear waste from burial sites, 2) the possible future application of this technology to other reactors, and 3) the need for preparation of an environmental impact statement on this issue.

With regard to Mr. Masterson's comments related to migration of radioactive material at waste disposal sites, the licensee, Commonwealth Edison has notified NRC staff that the disposal sites which are being considered for the Dresden 1 wastes are the Beatty, Nevada and Hanford, Washington commercial low-level waste disposal sites. Table 1 gives a brief summary of the disposal and environmental conditions at these sites, with a comparison to the region of disposal pits 2, 3 and 4 and trenches 5, 6 and 7 at Oak Ridge. These pits and trenches are clustered in the vicinity of Whiteoak Creek. There are many similarities between these disposal units, which include trench 7. This trench was found to be a source of chelated radionuclides. The major difference between the Oak Ridge site, where migration has been observed, and the commercial sites, where no migration has been detected, is the general lack of water at the commercial sites and the abundance of water at the Oak Ridge site. Oak Ridge experiences very high precipitation, has a water table which probably intersects pits and trenches, and the waste disposed was entirely liquid. For trench 7, which was identified by Duguid, Means and Crerar as a source of chelated radionuclides, we estimate that approximately 7 million gallons of liquid waste was disposed of during a three year period from 1962 to 1965. Considering the liquid to be evenly distributed over the area of trench 7, the equivalent water flow in terms of precipitation would be on the order of 100 feet per year. This is far in excess of the few inches of precipitation incident at the desert sites, where the majority of the precipitation is rapidly returned to the atmosphere by evaporation. The estimates of water flows at Oak Ridge are based on figures reported by Lomenick, Struxness, and Jacobs and trench dimensions from a report by Duguid.

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Migration of radionuclides from the Oak Ridge disposal trenches to the surface was also promoted by the type of geologic material in which the trenches were excavated. The trenches were founded in fractured shale which may have small solution cavities as well as fractures available to conduct water at rapid rates. Trench 6 which received liquid wastes for approximately one month, had to be taken out of service due to the breakthrough of radionuclides at a seep 100-foot downslope. Cesium-137 and Strontium-90 were present in the seep water, having migrated 100 feet in less than one month, due to fracture flow. In comparison the commercial disposal trenches at Beatty and Hanford are excavated in a weakly cemented alluvial fill and unconsolidated sand and gravel, neither supporting fracture flow. The topography and location of the Oak Ridge disposal sites promoted migration to surface seeps. The trenches were excavated in hills, such that trench bottoms are saturated, a hydraulic gradient exists to drive flow to surface seeps. The slopes leading from the wet low areas up to the disposal trenches are often in the range of 1:5 to 1:10. The commercial disposal sites at Beatty and Hanford on the other hand are characterized as flat desert areas with slopes on the order of 1:100 to 1:300, providing a much longer path between the trench bottoms and points where the surface are at equal elevation. Also, the intervening material is under-saturated, and volumes of water which are much greater than available in the desert would be required to saturate the soil before any significant flow to the surface could occur (for example as would cause the swampy regions associated with the Oak Ridge seeps).

Also, the solid wastes disposed at Beatty and Hanford are covered with three to five feet of dry sandy materials, which would absorb precipitation. This provides some protection against the occurrence of waste leaching. Should water be supposed to enter a desert disposal trench, it would tend to be absorbed by the trench walls and bottoms rather than collect in the trench bottom, thus, preventing saturation of the wastes and minimizing the time of the contact of wastes and water.

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TABLE 1. Comparison of the conditions at the Hanford, Washington and Beatty, Nevada, commercial low-level radioactive waste disposal sites to the conditions at the Oak Ridge, Tennessee, liquid waste disposal area (Pits 2, 3, and 4, and trenches 5, 6, and 7).

	<u>Oak Ridge</u>	<u>Beatty</u>	<u>Hanford</u>
Average precipitation	50"/year	4.5"/year	6.25"/year
Waste to aquifer distance	0+	300 feet	290 feet
Distance to nearest perennial stream	250 feet	10 miles	8 miles
Average evaporation for open water surfaces	34"/year	70"/year	42"/year
Waste form	35,000,000 gallons (liquid)	Solid*	Solid*
General description of site	Hilly, humid area	Flat, desert area	Flat, desert area

* Some liquid wastes were solidified on site or received sorbed on solids or packaged in sorbent material.

* The water table intersects some trench bottoms in the Oak Ridge disposal areas.

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The Honorable Paul Laxalt

Concerning Mr. Masterson's second comment relating to possible future use of this process, at this time no other licensees have proposed to decontaminate the primary cooling system of their reactors. The Dresden decontamination resulted from the particular circumstances at Dresden Unit 1. This decontamination was proposed by Commonwealth Edison so that they could gain access to the primary cooling system piping for Commission ordered safety modifications and in-service inspection. These same circumstances are not present at other reactors at this time.

With regard to Mr. Masterson's third comment, the Director of Nuclear Reactor Regulation has determined that an environmental impact statement should be prepared for the Dresden decontamination. A copy of this statement has been enclosed for your information, and a copy has been sent to Mr. Masterson.

If I may be of further assistance please feel free to contact me.

Sincerely,

(Signed) T. A. Rehm

William J. Dircks, Acting
Executive Director of Operations

Enclosure:

1. Draft Environmental Statement (NUREG-0686)
2. Letter to Senator Paul Laxalt from Kelly Masterson dated March 18, 1980.

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Draft Environmental
Statement (NUREG-0686)

*No NASS Concurrence needed
for Oak Ridge, Hanford, and Beatty
Geo-hydrological statements. This
statement is a direct quote from
NASS input to DES. PWOC.*

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