6600 Pershing Ave.
University City, Mo. 63130
June 17, 1980

Director, Division of Licensing
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

I have read the Draft Environmental Statement related to Primary Cooling System Chemical Decontamination at Dresden Nuclear Power Station Unit No. 1, Commonwealth Edison Company, May 1980, Docket No. 50-10, U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, and have the following questions:

1. In Appendix A to the Draft Environmental Statement (DES), in answer to Ms Drey's questions 2 and 4c, and to the ISEA's question 4, your staff assures us that, e.g., "Migration as observed at the Oak Ridge site would not occur at the Beatty, Nevada or Hanford, Washington commercial disposal sites...the climate, geology, and hydrologic conditions eliminate the possibility..." (p.9). The NRC's answers to all three questions are extensively based on the writings of Means, Crerar, and Duguid, 1976 and 1978. Perhaps you are unaware that, in this same 1978 article, Means, Crerar and Duguid reported that "Varying levels of radionuclide migration from original disposal sites have been observed at four of these waste burial sites other than Oak Ridge National Laboratory, including... the Hanford, Washington facilities..." (p. 1480, Science, vol. 200, 30 June 1978, pp. 1477-1481), citing Price and Ames in "Transuranium Nuclides in the Environment," International Atomic Energy Agency, Vienna 1976, p. 191.

Can you explain how this migration of radionuclides can be going on at Hanford (and probably at Beatty, since the two sites are, according to the NRC, so very similar) if, as your report repeatedly assures us, "the geological and hydrologic features of the burial site" make it impossible?

2. The Draft Environmental Statement says, in 4. 2. 3. Radioactive Waste Disposal, that the Beatty, Nevada and Hanford, Washington "sites have been chosen as waste burial locations because of their dry, arid environment and their favorable geologic, hydrologic, and meteorologic features. These two sites are located in dry desert locations where there is a very low annual rate of precipitation and a very deep water table. These two features combined with the remote location of these burial sites, provide assurance that the waste can remain isolated from the human environment for a period long enough to allow the principal radionuclides to decay to significant levels."

a. Even "dry, arid" and "remote" deserts support a large variety of life forms, both plant and animal, as anyone who has seen Walt Disney's "The Living Desert" knows.

(1.) Regarding plants: Chelating agents have been used for years in commercial fertilizers to increase enormously the absorption of nutrients, like trace metals, by plants. After experimenting with absorption of plutionium by plants, Lipton and Goldin

(Health Physics 1976 vol. 31 pp. 425-430) report that "chelation had a dramatic effect on plutonium uptake...on the average, the effect of chelation was to increase uptake by a factor of 1.3×10^3", i.e., increased by 1300%. They conclude that this uptake by plants makes radionuclides at large in the environment "a long term hazard in the terrestrial food chain."

In a similar investigation, Arthur Wallace (Health Physics 1972, vol. 22 pp.539-562) says that the chelating agent studied, "one year after the original application of the radionuclide to the soil,...was still able to increase uptake of the Americium-241" by plants. The chelating agent "could extract 100% of the ^{241}Am which had been applied to the soil" (p. 561). Thus, even if ground water can be neglected as a migration route out of the burial sites, if "the barrels were designed to meet the packaging requirements for transport of the solidified waste and are not designed to serve the purpose of remaining corrosion-resistant after burial" (NRC answer to Ms Drey in DES, Appendix A, p. 7), how can you rule out plants as a pathway for the chelated radionuclides into the environment?

(2.) Animals eat plants and other animals; this is what the "food chain" is all about. After chelated radionuclides are taken up and concentrated a thousand-fold or more by plants, it has been found that the chelating agents also "enhance the intestinal absorption of plutonium ingested by animals. Baxter and Sullivan found a 700-fold increase in gut absorption when the chelating agent was added to plutonium nitrate administered by gavage to rats" (Ballou, Price, et al., Health Physics vol. 34, 1978, pp. 445-450; Baxter and Sullivan, Health Physics vol. 22, 1972, p. 785). Similar absorption was found when rats were administered ground up tumbleweed which had taken up chelated ^{239}Pu, ^{241}Am, and ^{244}Cm. The radionuclides were "almost quantitatively excreted in urine," but "almost quantitatively excreted" is not entirely excreted, and ingestion of any radioactive material which has become lodged in tissues, organs or other parts of an animal's body can cause continuing irradiation in the person who eats the contaminated meat. Some people out west do eat jack rabbit and mule deer meat, which could contain residual or trace amounts of the Dresden chelated radioactivity taken up from or near the burial pits by plants. Clearly this is another route into the human environment not considered in the DES.

b. Is it not possible that some of the principal crud radionuclides to be shipped for burial will be longer-lived than the cobalt-60 isotope you mention?

(1.) Apparently Dresden has experienced fuel rod cladding failures during its 19 or 20 year occupational history, making it likely that some of the fission products and transuranics thereby released from the cladding would have precipitated out and mingled with the corrosion or activation products accumulated on the piping interiors. Some common fission byproducts have notoriously long half-lives, such as plutonium-239 (24,000 years) and technetium-99 (210,000 years).

(2.) Have you not overlooked some long-lived activation products which would most likely be present in the crud at Dresden, as at other reactors: nickel-63 (92 years), iron-60 (300,000 years) and manganese-53 (200,000 years)? I might even add, what about one

of the isotopes of the cladding used more recently at Dresden, zirconium? Zirconium-96 has a half-life of 3.6×10^{17}, or 360,000,000,000,000,000 years!

Surely the presence of any one of these should cause questions about an environmental impact statement based on the premise that the longest half-life to be dealt with is 5.3 years. Can you really "provide assurance that the waste can remain isolated from the human environment long enough to allow the principal radionuclides to decay to significant levels?"

3. In the Draft Environmental Statement frequent reference is made to the "geologic, hydrologic, and meteorologic" aspects of the waste disposal sites. I find it interesting that in an affidavit submitted in April 1978, Richard B. McMullen, a geologist in the Geosciences Branch of the Office of Nuclear Reactor Regulation, USNRC, testified that "based on a study of the Cascade volcanoes," including Mt. St. Helens, "We believe that there will be no increase in activity based on the experience of the past 10,000 years" (p.7; this affidavit was submitted during the operating license amendment proceedings designed to permit Portland General Electric Company to increase the number of spent fuel rods allowed to be stored in the Trojan nuclear plant "swimming pool"). This was written just two years ago, and even such accessible and unesoteric journals as Time and Newsweek are able to tell us that "scientists had been predicting a new eruption for five years" (Newsweek, June 2, 1980, p. 25).

Moreover, not just any scientists, but Crandell and Mullineaux of U. S. Geological Survey, whom McMullen cites throughout, predicted in 1975 "that Mt. St. Helens was the Cascade volcano most likely to reawaken from dormancy. 'We had predicted Mt. St. Helens would erupt within 100 years,' said Crandell. 'But then we went out on a limb and said before the end of the century.'" (National Geographic News Service, "Why Volcanoes Erupt," in the St. Louis Post-Dispatch, June 14, 1980) And in Science, vol 208, June 27, 1980, p. 1446, Crandell and Mullineaux "found that Mount St. Helens has not behaved at all consistently" but has swung from relatively quiet lava flows to the most violent kind of explosive ash eruptions and back again many times!

Somehow McMullen can read all this to mean that a violent eruption "is considered to be very unlikely within the next few centuries (Crandell and Mullineaux, 1975). It would represent a complete change in activity from that demonstrated during the last 10,000 years" (p. 6).

As for "meteorologic" expertise at the NRC, the same affidavit tells us that the NRC staff has concluded that "the prevailing winds blow away from the [Trojan] plant toward the volcano [Mt. St. Helens] most of the time and apparently have done so for thousands of years" (p. 2), and "such an eruption at one of these volcanoes occurring simultaneously with the wind blowing toward the site is extremely remote" (p.6). And yet this very thing occurred only two years later, with volcanic ash falling on Portland, Oregon, farther west than Trojan, on May 25 and June 13.

With this kind of record, how can we have any confidence in the NRC's evaluation of the safety-guaranteeing conditions at Beatty (near centers of earthquake activity and the underground atom bomb

testing grounds) and Hanford (150 miles east of Mt. St. Helens, with volcanic activity now being predicted for the whole Cascade Range)--particularly when radionuclide migration has already been documented at Hanford?

Sincerely,

Brigid K. McCauley

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(Mrs. Matthew P.)