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Mrs. Leo A. Drey 515 West Point Ave. University City, MO 63130

December 19, 1980

Director, Division of Engineering
Standards
Office of Standards Development
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Tera
TP 710-1

re: NUREG-0518

Dear Sir:

I am sorry to be mailing the enclosed comments to you so late. I only learned about this proposal on December 4, and although I received my copy of NUREG-0518 upon request promptly, my studying of it has been interrupted by the flu. Between my tardiness and the Christmas mail rush, I cannot imagine when this letter will reach your desk.

Again, my apologies.

Sincerely,

Kay Drey

DOCKET NUMBER
PROPOSED RULE PR - misc notice NuReg0518
45FR 70877

1/9/81

Acknowledged by card.

L-4-1, P430

515 West Point Avenue
University City, Missouri 63130
December 19, 1980

Director, Division of Engineering Standards
Office of Standards Development
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

re: Draft Environmental Statement concerning proposed rulemaking exemption from licensing requirements for smelted alloys containing residual technetium-99 and low-enriched uranium. NUREG-0518, October 1980.

Dear Sir:

The following comments and questions are submitted with the hope that the Nuclear Regulatory Commission will abandon its proposed regulation amendments designed to permit the sale on the open market of some 31,000 tons of radioactive scrap metal presently stored at uranium-enrichment plants -- potentially to be used for such items as "automobiles, appliances, furniture, utensils, personal items, and coinage." (p. 2-15). The proposal includes the unrestricted sale in the near future of radioactive scrap metal from decommissioned commercial nuclear power plants.

1. The Draft EIS lacks an estimate of the amount of gaseous diffusion processing that has occurred at each of the three enrichment plants of uranium that has already undergone fissioning in a reactor. That is, since reprocessed uranium is processed through the gaseous diffusion equipment at Paducah, Fernald and Oak Ridge, explaining the presence of the artificial isotope, technetium-99, what other fission products may also be present, and in what quantities? And which transuranics beside plutonium and neptunium (p. 2-1)?

It came as a great surprise to me to learn from an NRC staff member a few weeks ago that he had known since 1974 that technetium is present at the three commercial enrichment plants. I had thought that only freshly mined and milled (front-end) uranium was handled there, not reprocessed uranium. My surprise stems from when I first heard about Tc-99. That was back in 1978 when I read that it had been found unexpectedly in radioactive waste water at our nation's oldest commercial uranium fuel fabrication plant, a facility at Hematite, Missouri, 32 miles south of St. Louis.

It seems that in 1975, about a year after the most recent licensee had purchased the plant, some 5000 gallons of waste water had to be set aside in 55-gallon drums for six months in order to wait for its elevated gross beta activity to decay, before releasing it to unlined site evaporation ponds. Instead, the expected decay did not happen. The licensee then discovered that the beta-emitting culprit was the fission product, technetium-99 (with a half-life of 212,000 years), rather than thorium-234 (the uranium-238 daughter with a half-life of 24 days). The solution agreed upon with the NRC in 1976 was that Combustion Engineering, the licensee, was to be allowed to dump the waste water into a site pond after running it through an ion exchange column, supposedly to filter out the Tc-99. That apparently didn't work. By May 1978 technetium was detected in groundwater monitoring well samples.

The relevance of the Hematite story to the scrap metal dispersion proposal of NUREG-0518 is that in 1978 and 1979 I was assured by the NRC that the presence of Tc-99 at Hematite was an absolute surprise, and was clearly a one-time mistake. Now I have to wonder, instead, how many other times the uranium hexafluoride purchased from Paducah or elsewhere may have contained technetium and other fission products and transuranics, and how much of this material may have been released into Missouri's air and water since the plant's initial licensing in 1956. I also believe this story is

relevant because it demonstrates the inability of human beings to keep track of radioactive materials for even a few years, let alone for the requisite hundreds of thousands of years and longer. NUREG-0518's solution seems to be not even to try!

2. The Draft EIS underestimates the health hazards of technetium-99, or at least fails to acknowledge major gaps in knowledge about those hazards. Because the exposure to any radiation increases a person's risk of cancer and other life-shortening diseases, and of genetic damage, and because technetium's release of radiation will continue well beyond the imaginable future, any decision to release technetium into the biosphere today is a decision to release it forever. Although I had never heard of technetium before reading of its presence at Hematite, I learned through basic reference works that it is considered extremely radiotoxic -- certainly not the sort of stuff that should be released into the groundwater, especially in a rural area totally dependent upon wells for drinking water, as at Hematite.

According to the CRC Handbook of Chemistry and Physics, "Tc^{99} is a contamination hazard and should be handled in a glove box;" it gives off 620 million beta particles per second per gram. (1973-1974 edition, p. B-32). Apparently nuclear workers are particularly concerned about working with Tc-99 because "it is one of the most difficult things to get off the skin once it gets on, and no one really knows why." (I am sorry I am not at liberty to identify my source.)

According to a paper published by Union Carbide/Oak Ridge National Laboratory in June 1978, data are lacking on such major questions regarding Tc-99 as its retention in soils, its uptake by and concentration in edible vegetation, its uptake and retention by humans, and its concentration in individual human organs. What is already known, however, is that the current assessment of the radiological impact of technetium was based on assumptions which have since been discarded. The Oak Ridge authors, therefore, seem to be extremely concerned that technetium may well be far more toxic to humans than earlier dose estimates would have indicated. Hence, the dramatic title of their paper: "Assessment of Tc-99 Releases to the Atmosphere -- A Plea for Applied Research." As one example of their plea:

> "Little information is available to provide insight into possible long-term retention of Tc-99 in organs of interest (notably the thyroid); such data are needed to accurately assess the dose due to chronic exposure to routine releases from a nuclear facility. There is an urgent need for information describing the uptake and retention of Tc-99 in children, since they could comprise the critical segment of the population at risk." (emphasis added. By J. E. Till, et al., page 21)

This paper is not listed among the references in NUREG-0518, even though it deals in part specifically with Tc-99 discharged routinely from enrichment facilities into the atmosphere, a discharge which would of course occur during the proposed smelting -- with attendant health implications for the smelter workers and later for steelworkers, factory workers, and the public.

According to figures published in Energy News Digest, December 11, 1980, "Some 100 trillion curies of man-made radioactive wastes have been turned out since the early 1940's when bomb material began to be produced. ... To date no permanent disposition has been made of even a single pound of this waste, although better than $2 billion has been spent researching what to do with it." Surely our nation's scientists can find a better solution than to melt it all down into radioactive frying pans, iron tonic, and belt buckles. Once such materials are dispersed throughout the biosphere, they cannot be recovered when their adverse impacts on the public's health have become undeniably apparent.

Sincerely, Kay Drey

Mrs. Leo Drey (Kay)