

LDR

40-2061

RADIATION SAFETY SERVICES, Inc.

827 Simpson Street
Evanston, Illinois 60201

312/866-7744



August 26, 1980

SEP 3 11 35

Attention: W. T. Crow, Section Leader
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and Material Safety
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

We ask that you place on the record our attached report to the city of West Chicago. Much of this report has to do with basic radiation safety considerations. We call special attention to the section of the report prepared by our consulting geologist, Dr. Stephen Guggenheim which addresses the potential for future deterioration of the "clay vault" proposed by Kerr-McGee and the apparent absence of local availability for the clay specified by Kerr-McGee in their stabilization plan. Because of the stabilization plan's great potential for both radiological and chemical contamination we request that this report be given careful consideration during future reviews of the Kerr-McGee stabilization plan.

Yours truly,

Eli A. Port, Certified American Board
of Health Physics

EAP:esa
Enclosure
cc: City of West Chicago

EXEMPT

info

c

17282

8010200 270

RADIATION SAFETY SERVICES, Inc.

827 Simpson Street
Evanston, Illinois 60201

312/866-7744

April 3, 1980

RECEIVED APR 14 1980

William L. Guild, Attorney
City of West Chicago
475 Main Street
West Chicago, Illinois 60185

Subject: Kerr-McGee Stabilization Plan

Dear Bill:

The questions which have been raised in our discussions and correspondence can be conveniently broken down into three categories. The first and most fundamental has to do with those questions and issues relating to the health effects of low level radiation. The second has to do with possible sources of exposure, such as contamination of water supplies or elevated external background exposures. And the third has to do with the deficiencies in the Kerr-McGee Plan which could result in contamination of water or elevation of external backgrounds. The following discussion is preliminary to our meeting of April 4. This letter is prepared so we will have some clearly defined material to discuss on April 4. This should enable us to determine future directions.

With regard to the health effects of low levels of radiation, we are fortunate that much knowledge is presently available regarding these effects. The standards for protection which are applied almost universally in this world and are the standards used by the United States Nuclear Regulatory Commission, are based upon the recommendations of the National Council on Radiological Protection and Measurement, who in turn, base their recommendations upon the recommendations of the International Commission on Radiological Protection. The International Commission on Radiological Protection is a world body which bases its recommendations upon the protection of this and future generations throughout the world. Its concerns are divided between concerns for health effects in the present generation and for health effects in future generations.

Health effects which can be caused by exposures to low levels of radiation included malignancy induction, embryological effects, life span shortening and adverse genetic effects. At the exposure rates of interest to the citizens of West Chicago, we are unlikely to see any embryological effects or life span shortening. We do have serious concerns regarding the induction of malignancies and genetic effects.

The cancers which are recognized as being linked to low level radiation exposure are clinically indistinguishable from other cancers. It is thought that a significant fraction of the cancers in man are related to some form of environmental insult including naturally occurring background radiation. The cancers which have been clearly identified as being linked to radiation including bone cancer, particularly where people have ingested bone seeking radioactive materials such as radium-226 or thorium-232. It is also recognized that the alpha emitters such as thorium have a significant lung cancer induction effect particularly in a smoking

POOR ORIGINAL

William L. Guild

April 3, 1980

Page two

population. Other cancer related effects are those which are recognized as resulting from external or internal exposure to the thyroid gland and there is some evidence that leukemias which are thought to be radiation related, may be doubled by as low a dose as three to five rem.

The above mentioned effects are due to chromosomal changes in the somatic cells of individuals who are exposed. These changes will occur within the generation exposed and will not carry to the next generation. They are important because they cause health effects which in turn have economic cost due to both health care costs and loss of productivity to a community or society.

It is well recognized that there are genetic effects which can be induced by exposure to radiation. The effects we are concerned with will result primarily from doses due to external exposure to ionizing radiation. It is for this reason that we are concerned with external exposure rates which both exists in the city today and which may exist on the site of a disposal plant. Genetic effects result from chromosomal changes in the germinal cells of an organism. These effects are carried forward to future generations and may require many generations before the recessive deleterious effects appear. Most geneticists agree that the great preponderance of genetic changes are undesirable. Some will be eventually be removed from a population because the organism carrying the effect is either physically or socially unacceptable for reproduction. Other effects which are less severe may become firmly established within a population. It is important to note that any genetic effects which are recognized as being birth defects do not appear until much later in life, sometimes the fifth or sixth generation. These include some forms of congenital heart defects.

Thus we have concerns for both internal sources of exposure from thorium-232 and its daughters which might be inhaled or ingested and from the external radiation from buried deposits of thorium and its daughters.

Our obvious concerns are those which have to do with failures in the Kerr-McGee Plan which could result in contamination of either surface waters (including the waters drawn from shallow wells) or external exposure rates from ionizing radiation. We do not think it is likely that the Kerr-McGee Plan will contaminate deep city wells unless the impermeable material between the surface and the 800 foot level is breached by either manmade or natural occurrences.

We consider not only possible but also probable that any failure of the Kerr-McGee Plan will result in contamination of surface waters to the extent that the shallow wells as well as surface waters will not be fit to drink with regard to thorium contamination. These failures are described in the attached supplement report by our geologist Steve Guggenheim.

External exposure also can result from geologic failure of the Kerr-McGee Plan. However much overburden is placed on the deposits, it is possible for the described clay cap to fail or for settling of the material to result in a diminution of the shielding effect of the planned cap and overburden. Even within the limits of

POOR ORIGINAL

William L. Guild
April 3, 1980
Page three

any reasonably proposed shielding cap I would expect to find significantly increased external exposure above the stabilization site and I recommend serious consideration of public usage of the site.

In addition to the geologic considerations in the attached supplemental report and the criticisms by the various commenting agencies, I would like to emphasize that the Kerr-McGee Plan has three distinct areas of deficiency. The first, and I believe most important, is that insufficient consideration was given to economic considerations and alternate disposal plans. It appears that Kerr-McGee committed itself early in their considerations to the stabilization plan resulting in permanent or semipermanent deposition of hazardous materials in the city of West Chicago and has built all arguments around their early decision. Inadequate consideration was given to alternate sites in Illinois and inadequate technical consideration was given to the West Chicago site. It is also clear from the stabilization plan and from the public statements of the Kerr-McGee president that Kerr-McGee is not ruling out having future access to this material and to the possibility that they may wish to mine the West Chicago stabilization site if it is economically feasible. The third broad area of deficiency has to do with inadequate monitoring and future supervision of the site. If the Kerr-McGee Stabilization Plan were to be effected, Kerr-McGee should be required to perpetually maintain the site and monitor the site both for surface levels of radiation exposure and for its impact upon ground water. The only way to guarantee that such activities will be carried out is to require the establishment of a perpetual care fund, otherwise Kerr-McGee's failure to perform may necessitate long extended court procedures initiated both by the government of the city of West Chicago and by the various concerned regulatory agencies.

The above is, as I indicated, preliminary to our meeting this week. We can expand on any area in this report as you feel necessary. I want to emphasize that the biological effects of radiation are well known. The pathways by which the public could be exposed unnecessarily to ionizing radiation are understood and that the Kerr-McGee Plan is without precedence for strong technical foundation. Failure of this plan can result in the exposure of the citizens of West Chicago to unnecessarily high dosages of radiation with the accompanying health effects which will be at a low level of incidence but will be none the less real to those individuals in the community who suffer the effects.

Yours truly,



Eli A. Port, Certified,
American Board of Health Physics

EAP:esa
Enclosure
cc:Mayor Eugene Rennels

POOR ORIGINAL