



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

Occupational Health Field Station
 Division of Special Health Services
 Box 2537, Fort Douglas Station
 Salt Lake City 13, Utah

April 7, 1958

Cancer, Lung

Karl Z. Morgan, Director
 Health Physics Division
 Oak Ridge National Laboratory
 P. O. Box P
 Oak Ridge, Tennessee

Dear Karl:

Thank you for your letter of April 2, 1958. I am pleased to know that the information I gave you on the potash mines might be useful and to assure you that I will be glad to discuss this subject further at any time.

Your question concerning the incidence of lung tumors among uranium miners is difficult to answer. Primarily, this is because the data are as yet very scanty. Our 1954 study group included about 1300 miners of whom only about 20 had more than 10 years' experience in the industry. We have followed this group quite carefully and up to last September there have been 6 deaths in the 20 men with over 10 years' experience. Of these 6, three died of lung cancer. In the entire study group, there were 33 deaths but no cases of lung cancer outside of those previously mentioned. As you can see, these numbers are very small and it would indeed be difficult to draw any firm conclusions from such data. As it happens, we have environmental data on at least some of the mines in which these men worked and their exposure to radon and its daughters was very high. Again, we could not put a definite number to their exposure because of the limited time during which we studied the mines. However, I would guess that they worked in concentrations of radon and its daughters in the order of 1,000 to 10,000 micromicrocuries per liter. My own personal feeling is that if this rate of incidence continues for perhaps three more cases, that while the numbers still may not be statistically significant I will have a strong emotional feeling that such an incidence is real and probably connected with exposure to radiation. The National Cancer Institute is at present working up the data on our last summer's

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Human Studies Project

Karl Z. Morgan--4/7/58

examination, including the results of several laboratory studies which were done, and perhaps we will have more information when this work is completed. I am giving you this preliminary information because of your interest in this subject but would appreciate your keeping it confidential until the National Cancer Institute feels that they have sufficient data to prepare a report.

Sincerely yours,



Duncan A. Holaday
San. Engr. Director
Chief, Occup. Health Field Station

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April 2, 1958

Mr. Duncan A. Holaday
Sanitary Engineering Director
Chief, Occupational Health Field Station
Division of Special Health Services
Box 2537, Fort Douglas Station
Salt Lake City 13, Utah

Dear Duncan:

Thank you for your letter of March 24 and the information relative to the potash mines at Carlsbad, New Mexico. This information is very helpful to us, and I am passing it on to our geologist--W. deLaguna--and to the person in charge of our radioactive waste studies--E. G. Struensee. I hope before long it will be possible for some of them to visit you and discuss these matters in greater detail.

By the way, I have heard rumors from various sources that there is increasing evidence of a large incidence of lung tumors among the uranium mine workers in the United States. If there is any truth to these rumors I am sure you would be the first to have correct information. I would be most grateful if you would let me know what your observations are in this regard.

Sincerely,

Original Signed By
K. Z. MORGAN
Karl Z. Morgan, Director
Health Physics Division

CC: E. G. Struensee, w/cy ltr fm Holaday
W. deLaguna, w/cy ltr fm Holaday

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

Occupational Health Field Station
Division of Special Health Services
Box 2537, Fort Douglas Station
Salt Lake City 13, Utah

March 24, 1958

Karl Z. Morgan, Ph.D.
Oak Ridge National Laboratory
Carbide & Carbon Chemical Corp.
P. O. Box F
Oak Ridge, Tennessee

Dear Karl:

Recently I had occasion to visit the potash mines at Carlsbad, New Mexico. While there, I looked at the operations to see how feasible it would be to use the abandoned workings as a repository of radioactive wastes. If you will recall, we discussed this subject in Mercury, Nevada, last fall and you may already have the information which I obtained.

The potash beds at Carlsbad occur in a deposit of salt. The horizons which are mined vary from 6 to 20 feet in thickness and consist of about 50% potash salts and 50% sodium chloride. The sodium chloride deposits extend for 100 feet or so above and below the potash horizons. In some areas, the salt deposits may be much thicker than this. In some mines, only one horizon lying at a depth of about 1,000 feet is mined. In others, there are 3 horizons starting at about 850 feet and separated by 100-foot intervals. The mines are very dry; the temperature of the deposits is 70°F. There certainly is a large amount of open space underground. One mine has abandoned workings extending for $3\frac{1}{2}$ miles. The usual method of operation is to take out about 60% of the mineral on the way in and then retreat, pulling the pillars which contain about 20% more of the potash. The roof is very stable and even in the areas that have been abandoned for several years, very little collapse has taken place.

I do not know whether this information is what you require in order to determine the usefulness of such areas for your purpose. However, if the data I have given you indicate that the abandoned workings are of interest, I am sure I could obtain answers to specific questions which you might have. Incidentally, the natural radioactivity of the air in these mines is the lowest we have ever found in any underground workings. Even in an area which had been abandoned and sealed for a year, the highest radon level we found was 3 micromicrocuries per liter. Best wishes.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Duncan".

Duncan A. Holaday, San. Engr. Dir.
Chief, Occup. Health Field Station

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