PLAINTIFF'S EXHIBIT

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ASBESTOS FEEDING STUDY FINDS NO GASTROINTESTINAL CANCER IN TEST ANIMALS

A lifetime study[1] of rats fed asbestos, taconite tailings and Lake Superior water recently concluded, "Autopsy studies revealed no significant increase in the incidence of malignant tumors in any experimental group compared with that in the control group." The study, initiated in 1973, was conducted by physicians at St. Luke's Hospital, Duluth, Minnesota, the University of Illinois' Abraham Lincoln School of Medicine and the University of Minnesota School of Medicine.

The objective of the research was to evaluate the carcinogenecity of ingested mineral fibers in various forms. In discussing the study's rationale, the authors acknowledge how little was known in 1973 about the biological effects of ingested asbestos. They point out that although workers inhaling asbestos dust "probably suffer some gastrointestional exposure by swallowing mucus containing asbestos fibers ... there was no assurance that this was the equivalent to direct ingestion of amphibole (asbestos)-contaminated water."

The test animals, 190 Sprague-Dawley rats, were divided into seven exposure groups:

(1) Control (no exposure)
(2) Unfiltered Duluth tap water (average fiber content 100 million fibers per liter)
(3) Lake Superior water sediment (average fiber content 5,000 million fibers per liter)
(4) Taconite plant tailings (average fiber content 100,000 million fibers per liter)

CAPCO JEN 0033216

(5) Low dose asbestos (chrysotile and amosite; 20 milligrams per rat per day; approximately 5,460 million fibers per liter)

(6) High dose asbestos (300 milligrams amosite per rat per day; approximately 78,000 million fibers per liter)

(7) Diatomaceous earth (20 milligrams per rat per day)

Complete gross and microscopic autopsies were performed on 187 of the 190 test and control animals. The entire gastrointestinal tract of each animal was inspected and transilluminated; tissue specimens were removed from representative pre-selected sites and from all abnormal areas. The investigators concluded:

> The most significant finding in our study was the total absence of gastrointestinal cancer in animals exposed to the test materials. Any direct carcinogenic action of ingested asbestos fibers should have its primary impact on the gastrointestinal mucosa.
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> Under the conditions of our study, ingested asbestos, taconite tailings, unfiltered Duluth (Lake Superior) tap water, Lake Superior reservoir sediment and diatomaceous earth had no demonstrable carcinogenic effect on the gastrointestinal tract or on other body tissues of the rat.

REFERENCES

1. Hilding, A.C., Hilding, D.A., Larson, D.M., and Aufderhiede, A.C., "Biological Effects of Ingested Amosite Asbestos, Taconite Tailings, Diatomaceous Earth and Lake Superior Water in Rats," Archives of Environmental Health 36, 298-303 (November-December) 1981.

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CANADIAN DEPARTMENT OF NATIONAL HEALTH AND WELFARE RELEASES ASBESTOS IN DRINKING WATER RESULTS

Results of a Canadian government study[1] show no consistent increased cancer deaths for persons living in localities where high levels of asbestos are present in drinking water.

Asbestos is an important mineral commodity in Canada. Although it occurs naturally in many parts of the country, its mining is concentrated in the Province of Quebec. The presence of asbestos in municipal water supplies prompted the Department of National Health and Welfare to survey the asbestos content of Canadian drinking water. Samples of raw, treated and distribution water were collected from seventy-one locations. These were analyzed according to the U.S. Environmental Protection Agency (EPA) interim procedure for determining asbestos content of water. The results then formed the basis of an epidemiological study.

The sampling portion of the study concluded that chrysotile was " ... the major asbestos type present in drinking water with some 5% of the population receiving water with asbestos concentrations greater than 10×10^6 (10 million) fibers per liter." The median fiber lengths were between 0.5 and 0.8 micrometers. Where very long fibers (up to 50 micrometers) were observed, these did not form a majority of the fibers present.

The epidemiological study analyzed the relationship between mortality (death) rates and asbestos levels in drinking water. The seventy-one sampled cities were divided into two exposure groups — those with levels greater than 100 million fibers per liter and those with less than 5 million fibers per liter. Within these two groups, death rates from

CAPCO JEN 0033218

various causes were compared. The study concluded:

> Although there are serious limitations to this type of study, no consistent increase in mortality rates for any cancer was demonstrated. This finding is consistent with the previous, but more limited, epidemiology study carried out in Quebec.

The study to which the authors referred also was conducted by the Canadian Department of National Health and Welfare[2]. It involved an investigation of municipalities in the asbestos mining regions of Quebec where populations were exposed to asbestos levels as high as 1.3 billion fibers per liter of drinking water. That study concluded:

> A study of twenty-two municipalities in Quebec did not reveal excess cancer mortality that could be related to the presence of asbestos fibers in drinking water supplies.

REFERENCES

1. Toft, P., Wigle, Meranger, J. C. and Mao, Y., "Asbestos in Drinking Water in Canada," The Science of the Total Environment 18, 77-89, Elsevier Scientific Publishing Company, Amsterdam, 1981.

2. Wigle, D. T., "Cancer Mortality in Relation to Asbestos in Municipal Water Supplies," Archives of Environmental Health, 185-189, 1977.