

ILLINOIS POLLUTION CONTROL BOARD
January 8, 1987

CITY OF MORRIS,)
)
) Petitioner,)
)
) v.) PCB 86-125
)
) ILLINOIS ENVIRONMENTAL PROTECTION)
) AGENCY,)
)
) Respondent.)

MESSRS. FRANK J. BLACK OF BLACK & BLACK AND GERALD W. SHEA AND IRA A. ROGAL OF SHEA, ROGAL & ASSOCIATES, LTD. APPEARED ON BEHALF OF THE PETITIONER.

MR. WAYNE L. WIEMERSLAGE APPEARED ON BEHALF OF THE RESPONDENT.

OPINION AND ORDER OF THE BOARD (by J. Marlin):

This matter comes before the Board upon an August 18, 1986 petition for variance from restricted status filed by the City of Morris (Morris). Morris is requesting a variance for a period of three years from 35 Ill. Adm. Code 602.105(a), Standards for Issuance, and from 35 Ill. Adm. Code 602.106(b), Restricted Status, but only to the extent that those rules involve 35 Ill. Adm. Code 604.301(a) (combined radium-226 and radium-228 levels) and (b) (gross alpha particle activity). On August 28, 1986, the Board issued an Order which cited deficiencies in Morris' Petition for Variance. The Board received written objections from citizens opposing this proposed variance on September 8. Morris filed with the Board its First Amended Petition (Am. Pet.) on September 17. The Board by its Order of September 25, 1986 accepted this matter for hearing. On November 6, 1986, the Board granted the Illinois Environmental Protection Agency's (Agency) Motion to File Agency Recommendation Instanter. In the Agency Recommendation (Ag. Rec.), the Agency recommended that Morris be granted this variance subject to certain conditions. The hearing on this matter was held on November 13, 1986 in Morris, Illinois; members of the public were present.

Morris is located in Grundy County, Illinois. Morris owns and operates a public water supply and distribution system. This includes three deep wells, pumps, and distribution facilities. (Am. Pet. p. 7).

The depths, ages, production, and location of the Morris wells are as follows:

<u>Well No.</u>	<u>Depth</u>	<u>Placed in Operation</u>	<u>Gallons Per Minute</u>	<u>Location</u>
3	865 ft.	1915	950	Wauponsee & Main Street
4	1501 ft.	1938	560	West Washington St
5	1462 ft.	1954	1000	Gould Park Drive

(Am. Pet. p. 7)

Morris presently aerates its water to remove hydrogen sulfide and reduce the iron content. (R. 42). In addition, Morris adds chlorine, to disinfect the water, and also fluoride. (Am. Pet. p. 6).

Morris' potable water supply and distribution system serves 3,600 residential commercial and light industrial users. Morris has a resident population of approximately 9,500 (Am. Pet. p. 10).

Morris states that it was first informed of the combined radium-226 and radium-228 level exceedance of the maximum allowable concentration (MAC) by an Agency letter dated October 4, 1985. The MAC for combined radium is 5.0 pCi/l. The Agency report indicated that Morris' combined radium concentration was 10.4 pCi/l. Morris also states that it was first informed of the gross alpha particle activity exceedance by an Agency letter dated May 5, 1986. The MAC for gross alpha particle activity (including radium but excluding radon and uranium) is 15 pCi/l. The Agency reported Morris' gross alpha particle activity at 25 ± 4 pCi/l. The Agency data was based upon four consecutive quarterly samples. (Am. Pet. p. 8).

Morris is requesting this variance to allow extensions of its public water supply system. If this variance is granted, Morris states that it expects to extend its water mains to serve two new residential subdivisions. The Tanglewood Subdivision, which would consist of 18 single family residences and 24 multiple family residences, is expected to have a population of 111 people. The Trend Builders Subdivision, First Addition would contain 30 single family residences with an anticipated total population of 90 people. (Am. Pet. p. 7). According to Morris, these subdivisions have already been approved by Morris and are ready for construction. (R.44-45). Morris also stated that there is a proposal for a retirement village which would consist of 200 dwelling units as well as a 120 bed nursing home. However, Morris asserts that the construction on the retirement village would not likely be completed within three years. (R. 51-52). Morris stated that it issued a record high number of building permits in the year 1985 "indicating that there is a high level of building activity and a need to extend watermain [sic] to serve these needs." (Am. Pet. p. 15).

As its compliance plan, Morris has proposed the construction of an ion exchange water softening system. After the installation of this system, Morris estimates that its treated water would have a combined radium-226 and radium-228 level of 4.5 pCi/l. After treatment, Morris also expects that its water will also have a gross alpha particle activity level of 11 pCi/l. (Am. Pet. p. 10). Morris anticipates that the financing, plans, and specification of the treatment facilities would be completed within 24 months of the granting of a variance. According to Morris, actual construction of the facility would take approximately 36 months from the date of a variance grant. The estimated cost for the treatment facility is \$800,000. (Am. Pet. p. 9). Morris has calculated that the cost of these improvements, including financing costs, will raise a user's monthly water bills by \$2.43 for the next 15 years. In addition, the operation cost of the new treatment system will increase the user's monthly bill by \$1.50 for as long as the treatment facility is operated. (Am. Pet. p. 10).

Morris has had its wells tested to determine whether blending water from the wells in various amounts would effectively lower the combined radium and gross alpha particle activity levels below the respective MAC's. A civil engineer testified for Morris that this alternative was not possible because the three wells had approximately the same levels of concentration for each contaminant. (R. 46). He also stated that a lime softening process was not selected as a treatment method since the initial construction and operating costs of such a system were significantly higher than an ion exchange process. In addition, he asserted that there are problems associated with the disposal of the lime sludge generated by this process. (R. 50-51). In its recommendation, the Agency stated that an ion exchange water softening system would remove more than 90% of the radium. According to the Agency, the use of such a system would increase the sodium content of the drinking water which in turn might be a potential problem for persons who are hypertensive or who have heart problems. (Ag. Rec. p. 8).

Morris did not conduct a formal assessment of the effect of this variance upon the environment. However, Morris refers the Board to and incorporates by reference the testimony and exhibits presented by Richard E. Toohey, Ph.D. and James Stebbings, Ph.D., both of Argonne National Laboratory, on July 30 and August 2, 1985 in R85-14, Proposed Amendments to Public Water Supply Regulations 35 Ill. Adm. Code 602.105 and 602.106. (Am. Pet. p. 11).

In addition, Dr. Toohey testified for Morris at the Board hearing in this matter. (R. 8-38). He stated that he believes that the radium levels in Morris' water are "perfectly safe" (R. 11). He also testified that drinking "Morris water at 10 picoCuries to the liter, two liters a day for a year gives somebody about the same radiation dose as they would get from, say, one chest X-ray or other medical procedure." (R. 12). In

addition, he claimed that risk of contracting cancer from smoking 1.4 cigarettes in a lifetime would be greater than the risk due to radium in the water. (R. 14).

Toohey also stated that there is reliable human data on the effect of radium on people (R. 19). According to Toohey, Argonne National Laboratory formed a study group in 1969 which combined three previous studies of case histories of radium dial painters. The study represents the exposure to varying amounts of radium of over 6,000 people (R. 22). Actual radium body content levels have been measured in 2,400 of those people (R. 23). Toohey testified that there are two types of cancer that "have been observed to be induced by radium." The first is bone cancer. The second type is a head cancer. Toohey stated that radium-related tumors were observed in 89 people of the 2,400. The remaining number of the group of 2,400 did not show any "excess mortality from any cause." (R. 24). Toohey explained that the case with lowest radium intake which still resulted in cancer was that of a boy who had received radium as part of a medical treatment at age 7 or 8. Fifty or sixty years later, that person developed a head cancer which proved fatal. The radium intake for this case was 9 microCuries, which is equivalent to 9 million picoCuries. (R. 25). The next lowest intake case that developed a cancer had an intake of 50 microCuries, or 50 million picocuries. (R. 26).

Toohey stated that the U.S. Environmental Protection Agency (U.S.EPA) model, which was used to set the 5 pCi/l standard, is not supported by observed data from actual radium exposure cases. (R. 28). Toohey explained that actual case histories indicate that "[a]s the radium intake goes up, the age at which bone cancer appears decreases...However, as radium intake goes down, the age at which cancer appears goes up." In the second situation, Toohey claims one may have to live beyond his or her normal lifespan before contracting cancer. (R. 29-30). From such data, Toohey concludes that the practical threshold for radium intake, above which cancer may be induced, is 9 microCuries. (R. 31). Toohey claims that to reach this threshold amount "one would have to be drinking water at the rate of 2 liters or about 2 quarts a day containing 5 picoCuries radium per liter for a bit more than 12,000 years." (R. 11). Toohey concluded that even using U.S.EPA model developed in 1986, there was a "0.07 percent chance of an extra cancer occurring in the additional people," added by the new subdivisions, if this variance was granted. Under an Argonne National Laboratory model, that statistic was calculated at 0.02 percent. (R. 34).

In its recommendation, favoring the granting of a three year variance, the Agency concluded that "an incremental increase in the allowable concentration for the contaminant in question even up to a maximum of four times the level of the maximum allowable concentration (MAC) for the contaminants in question, should cause no significant health risk for the limited population served by new water main extensions for the time period of this

recommended variance." (Ag. Rec. p. 7). The Agency further stated that the "denial of the recommended variance would be an arbitrary and unreasonable hardship" to Morris. (Ag. Rec. p. 9).

Morris has proposed a compliance plan of designing, financing, and constructing an ion exchange softener system. Once this treatment facility is constructed, Morris expects to be in compliance with the MAC's for combined radium-226 and radium-228 as well as gross alpha particle activity. Morris states that this treatment facility can be constructed in three years. If this variance is denied, Morris will not be able to extend its water mains to serve new developments. Morris claims that such a denial would hurt "prospective home purchasers as well as business developers and Petitioner's tax base." (R. 14). Considering the environmental impact and Morris' situation in total, the Board finds that denying this variance would constitute an arbitrary or unreasonable hardship. Consequently, the Board hereby grants Morris a variance for 3 years subject to conditions set forth in the Order.

The Board also notes that the U.S.EPA has challenged several Board issued variances from the radiological standards as being inconsistent with the state's obligation under the Safe Drinking Water Act. However, the variance requested here is solely from the state regulations establishing the restricted status mechanism and not from the national primary drinking water regulations. Consequently, this variance will not insulate Morris from the possibility of enforcement for violations of the underlying radiological standards.

This Opinion constitutes the Board's findings of fact and conclusions of law in this matter.

ORDER

The City of Morris is hereby granted a variance from 35 Ill. Adm. Code 602.105(a), Standards of Issuance, and 602.106(b), Restricted Status, as these rules relate to exceedances from the combined radium-226 and radium-228 limitation of 35 Ill. Adm. Code 604.301(a) and the gross alpha particle limitation of 604.301(b) subject to the following restrictions.

- 1) That this variance expires on January 8, 1990.
- 2) In consultation with the Agency, Petitioner shall continue its sampling program to determine as accurately as possible the level of radioactivity in its wells and finished water. Until this variance expires, Petitioner shall collect quarterly samples of its water from its distribution system, shall composite and shall analyze them annually by a laboratory certified by the State of Illinois for radiological analysis so as to determine the concentration of the contaminants in question. The results of the analyses shall be reported to the Water

Quality Unit, Division of Public Water Supplies, 2200 Churchill Road, IEPA, Springfield, Illinois 62706, within 30 days of receipt of each analysis. At the option of Petitioner, the quarterly samples may be analyzed when collected. The running average of the most recent four quarterly sample results shall be reported to the above address within 30 days of receipt of the most recent quarterly sample.

- 3) Compliance shall be achieved with the maximum allowable concentrations in question no later than three years from grant of this variance.
- 4) Within three months of the grant of the variance, the Petitioner shall secure professional assistance (either from present staff or an outside consultant) for planning the construction of an ion exchange water softening system.
- 5) Within four months of the grant of variance, evidence that such professional assistance has been secured shall be submitted to the Agency's Division of Public Water Supplies, FCS, at 2200 Churchill Road, Springfield, Illinois 62706.
- 6) Financing and plans and specifications for the ion exchange water softening system shall be completed within 24 months of grant of this variance.
- 7) Within 24 months after said time Petitioner shall apply to IEPA DPWS, Permit Section, for all permits necessary for construction of installations, changes or additions to the Petitioner's public water supply needed for achieving compliance with the maximum allowable concentration for the standards in question.
- 8) Within three months after each construction permit is issued by IEPA, DPWS, Petitioner shall advertise for bids from contractors to do the necessary work described in the construction permit and shall accept appropriate bids within a reasonable time.
- 9) Construction allowed on said construction permits shall begin within a reasonable time of bids being accepted, but in any case, construction of all installations, changes or additions necessary to achieve compliance with the maximum allowable concentration in question shall begin no later than 30 months from the grant of this variance and shall be completed no later than 36 months from the grant of this variance.
- 10) Pursuant to 35 Ill. Adm. Code 606.201, in its first set of water bills or within three months after the date of this Variance Order, whichever occurs first, and every

three months thereafter, Petitioner will send to each user of its public water supply a written notice to the effect that Petitioner has been granted by the Pollution Control Board a variance from 35 Ill. Adm. Code 602.105(a) Standards of Issuance and 35 Ill. Adm. Code 602.106(b) Restricted Status, as it relates to the MAC standard in question.

- 11) Pursuant to 35 Ill. Adm. Code 606.201, in its first set of water bills or within three months after the date of this Order, whichever occurs first, and every three months thereafter, Petitioner will send to each user of its public water supply a written notice to the effect that Petitioner is not in compliance with the standard in question. The notice shall state the average content of the contaminant in question in samples taken since the last notice period during which samples were taken.
- 12) That Petitioner shall take all reasonable measures with its existing equipment to minimize the level of contaminant in question in its finished water.
- 13) That within forty-five days of the date of this Order, Petitioner shall execute and forward to Wayne Wiemerslage, Enforcement Programs, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706, a Certificate of Acceptance and Agreement to be bound to all terms and conditions of this variance. This forty-five day period shall be held in abeyance for any period this matter is being appealed. The form of the said Certificate shall be as follows:

CERTIFICATION

The City of Morris has received and understands the Order of the Illinois Pollution Control Board in PCB 86-125, adopted on January 8, 1987, and hereby accepts said Order and agrees to be bound to all of the terms and conditions thereof.

By

Title

Date

IT IS SO ORDERED.

B. Forcade and J. Dumelle dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 8th day of January, 1987, by a vote of 4-2.

Dorothy M. Gunn
Dorothy M. Gunn, Clerk
Illinois Pollution Control Board