

ILLINOIS POLLUTION CONTROL BOARD
November 6, 1986

CITY OF JOLIET)
)
 Petitioner,)
)
 v.) PCB 86-121
)
 ILLINOIS ENVIRONMENTAL)
 PROTECTION AGENCY,)
)
 Respondent.)

THOMAS A. THOMAS, CITY OF JOLIET CORPORATION COUNSEL, APPEARED ON BEHALF OF PETITIONER; AND

WAYNE L. WIEMERSLAGE APPEARED ON BEHALF OF RESPONDENT.

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

This matter comes before the Board on an August 12, 1986 petition for variance, as amended on August 19, 1986, filed by the City of Joliet (City). The City seeks a five-year variance from Section 39 of the Environmental Protection Act (Act) and the Board's public water supplies regulations, 35 Ill. Adm. Code 602.105(a) "Standards for Issuance" and from 602.106(b) "Restricted Status", to the extent these rules involve 35 Ill. Adm. Code 604.301(a) and (b), the 5 pCi/l standard for combined radium-226 and radium-228, and the 15 pCi/l gross alpha activity standard (including radium-226, but excluding radon and uranium). On October 6, 1986, the Illinois Environmental Protection Agency (Agency) filed a Recommendation in support of variance, with conditions, from the combined radium standard; however, the Agency recommended that variance from the gross alpha particle standard be denied as unnecessary, a recommendation with which the City concurred at hearing. Hearing was ordered by the Board on August 14, 1986.

On August 28, 1986, the Board denied the City's motions a) for conditional Waiver of Deadline for Board Decision; b) to Rescind Board's Order for Hearing; and c) for Expedited Pollution Control Board Meeting.

On September 2, 1986, Mrs. Gisela Topolski filed an objection to grant of variance; however, at hearing, and by post-hearing motion filed October 20, 1986, Mrs. Topolski requested leave to withdraw her objection and be registered in support, with certain conditions. The Board notes that the Hearing

Officer reserved Citizens Exhibit No. 1 for Mrs. Topolski's post-hearing submittal; therefore, the Board will grant Mrs. Topolski's motion and, on its own motion, will incorporate Mrs. Topolski's October 20, 1986 submittal into the hearing record as Citizens Exhibit No. 1.

Hearing was held on October 20, 1986. Two or three members of the public other than those testifying were present (R. 153). Testimony in support of variance was presented by citizens Mrs. Topolski and Mr. Frank Markum. Joliet presented testimony of the following witnesses in support of its petition: Dr. Richard E. Toohey, a biophysicist at Argonne National Laboratory; Mr. Dennis L. Duffield, the City's Director of Public Works and Utilities; Mr. Richard A. Clark, a civil engineer responsible for the City's Water and Sewer Distribution and Production Systems; Mr. Ira Markwood, acting as a consultant for the City and formerly Manager of the Agency's Division of Public Water Supplies; and Ms. Ruth Calvert, Executive Vice President of the Joliet, Will County Center for Economic Development.

THE EXISTING SYSTEM

The City's water supply serves about 21,000 residential and 1,500 industrial and commercial users, representing about 78,000 residents and 2,500 businesses.

On December 9, 1985, the Agency notified the City that its water supply exceeded the combined radium standard, and on December 19, 1985 the City was notified that it would be placed on restricted status. The supporting analysis showed radium-226 at 6.5 pCi/l and radium-228 at less than 1.0 pCi/l, which in combination indicates a concentration of 6.5 pCi/l.

The City draws water from 12 deep wells placed in operation between 1907 and 1976, and five shallow wells all placed in operation in 1951. (Amend. Pet. p. 5)

Starting in January, 1986, the City proceeded with resampling of all its wells and the distribution system, and was receiving sample analyses up to the time of hearing. (Amend Pet. 6-8, R. 63-64, Pet. Ex. 4,5)

The gross alpha standard was not exceeded on resampling, and therefore, as noted earlier, the City concurred with the Agency that no variance from that standard was needed. (R. 63, Pet. Ex. 4 and 6) However, resampling verified the combined radium exceedances (Amend. Pet. p. 7,8, R. 63, Pet. Ex. 5).

Regarding notice, the City did not mail out individual notice to water users within three months as required by Board rules. The delay appeared to be due to the City's sampling program to verify the Agency's results, since the Agency's

samples were collected in 1980 and 1981. (R. 65.) In any event, some notice was provided in June by way of news coverage of the City Council's public discussion of the problem and its determination to seek variance; and individual notice was mailed in October by separate mailing because the water bills are a postcard type. (R. 65, 66, Pet. Ex. 3,7)

Mr. Duffield testified that the City has embarked on a blending program, which is possible, but only in certain parts of the City. Water from the shallow aquifer is blended with water from three deep wells at the Fairmont and Garvin storage tank. To increase the flow rate, the City has installed a new pump in shallow Gravel Well No. 2, as well as removing obstructions in the gravel packing of the well by chemical treatment. The City also has contracted for chemical treatment on shallow Gravel Well No. 1, and work is in progress to install a new pump on shallow Gravel Well No. 5. The results calculated for the blending efforts are that the Fairmont-Garvin section will receive waters containing an average and maximum radium content of 3.1 pCi/l, and the east (downtown) section will receive waters containing 5.0 pCi/l average and 5.8 pCi/l maximum. However, the west side will receive waters containing 10.0 pCi/l average and 11.0 pCi/l maximum; since the facility is located west of the Des Plaines River, no blending waters from the shallow wells, which are located on the east side of the River, are available without a major construction project. This project would cost, at a minimum, over \$2,000,000. Even then, compliance levels would not be achieved throughout the system. (R. 70-84, Pet. Ex. 8 and 9)

COMPLIANCE OPTIONS:

Mr. Clark and Mr. Markwood presented testimony regarding compliance options:

1. Development of new shallow groundwater sources for blending was investigated. The three shallow low radium limestone aquifers underlying Joliet are either being rapidly dewatered or have already been dewatered, and will not produce water in sufficient quantities to be usable as a municipal source. Efforts by others to tap this source have not been successful. It was also pointed out that water in the dolomite formations is subject to pollution and capable of carrying contaminants for long distances fairly rapidly (R. 95-107, 121, 122, Pet. Ex. 12-15).
2. Treatment of the water from the existing deep Galesville Sandstone aquifer, a formation in the Cambrian and Ordovician rocks, is feasible, costing \$15 million and requiring seven years to construct and test. The treatment methods addressed and the testimony concerning them were:

- a) Reverse osmosis. This option was not considered because of the nature of Joliet's deep well water; before utilizing reverse osmosis, the water would require pretreatment to remove hardness and iron, but such pretreatment also would remove radium and thus renders reverse osmosis unnecessary.
 - b) Ion exchange. This option removes radium but increases sodium, and may be a problem for those on a restricted sodium diet. Also, the waste generated concentrates radium as a liquid, which makes landfilling difficult and, with high total solids, difficult to dispose of in any case. It also presents an exposure hazard for anyone having to work inside the tank.
 - c) Lime softening. The resulting sludge does not create a special landfill problem and might be used for agricultural purposes. However, lime softening of the existing system would not leave room for expansion, and installation of a treatment plant would cost about the same as a treatment plant used for Kankakee River water. Most important, the water level in the deep aquifer is dropping from 5-6½ feet per year, is being over-pumped at four times its safe yield capacity, and will no longer be a viable water source for Joliet at some future time. Even were the aquifer to later stabilize, the City believes it may stabilize at a depth such that it would no longer be economically feasible to maintain and operate the wells (R. 75-81, 120-125).
3. Development of a Kankakee River water source. The City's preferred option is development of the Kankakee River as the water source, because of its likelihood of success and because it will supply more water. Also, it was pointed out that, unlike the groundwater sources, water from the Kankakee would be sufficient for blending if desired. This option has been supported by previous studies, as early as the 1967 State report "Water for Illinois, a Plan for Action". The City estimates the project will cost \$35 million and take seven years to construct, plus another year to test out. (Amend. Pet. Attach. 2, Alternative B, Pet. Ex. 10, R. 74-81). Joliet asserts that the long time period is occasioned in part by the time needed to issue revenue bonds and to receive a water withdrawal permit. Joliet believes that it could service some or all of nine other nearby communities and the Joliet Army Ammunition Plant, all of which are on restricted status because of excess radium. Notwithstanding, the City is committed to the project even if financial assistance from other communities is not forthcoming, and has bonding capability sufficient to finance the project independently. However, if it proceeds alone, Joliet believes it would have to get a separate withdrawal permit

rather than using the Regional Water Authority's permit which has already been issued for the area (R. 75-81).

HARDSHIP AND ENVIRONMENTAL EFFECTS:

Ms. Calvert testified that an active major marketing program is underway for the area (Pet. Ex. 17). The effort was initiated because of Joliet's unemployment rate, which in 1983 was 26.5%, the highest in the nation. Presently there are 23 prospects for new development, 2 of which are close to announcement. However, the uncertainty of water line connections has restricted the marketing area and has affected the number of sites that can be shown to prospects (R. 129-134). Mr. Duffield testified that there are three projects now under construction where the owners are proceeding at their own risk, and one additional project has been submitted to the Agency for permitting review (R. 81).

Dr. Toohey presented testimony regarding radium effects. He noted that some of his testimony has already been presented in the Board's pending regulatory proceeding R85-14 (Pet. Ex. 1). He addressed three models in assessing risk factors: first, the USEPA model used for determining the interim drinking water standards established in 1976; second, the USEPA revised model used for establishing the pending revised standards; and third, the Argonne model based on observed data for the radium dial painters. Assuming an exposure of eight years to 78,000 residents drinking two liters per day of City water containing radium at a level of 6.5 pCi/l, the first model calculates to 1.12 excess cancer deaths; the second model calculates to 0.51 and the third model calculates to 0.28. If Argonne's concept of a threshold is used, the predicted excess deaths would be zero, rather than the one or less excess death using the no threshold concept. Dr. Toohey also submitted a paper prepared for and completed in 1983 at the National Workshop for Radioactivity in Drinking Water under the sponsorship of USEPA. It was published in May, 1985 in the Health Physics Journal. The paper, "Metabolism of Ingested U and RA", Wrenn et al. (1985), contains more than 120 references and concludes, in part: "The interim ^{226}Ra limits in water could be relaxed by a factor of at least 4, and still provide a very high degree of protection for individuals" (R. 30-49, Ex. 2, p. 612, Recommendation No. 7).

The Agency believes that grant of variance for the time period in question, even up to a maximum of four times the present standard, should cause no significant health risk and that hardship resulting from denial of variance would outweigh any injury to the public if variance is granted. The Agency also favorably noted the possibility of Joliet assisting other communities in obtaining Kankakee River water (Agency Rec. p. 11, R. 148).

The City accepted the Agency's recommended conditions with certain changes, i.e. that the City strike the request for variance from Section 39 of the Act, and that all construction should begin no later than three and one-half years after grant of variance, rather than three years thereafter (R. 139-140). The Agency also noted, but did not recommend, that a variance only for the 16 months needed prior to application for a permit could be granted. The Agency supports variance for five years, noting that any requested extensions thereafter could be denied if Joliet has not proceeded in a timely manner.

CONCLUSIONS

Based on this record, the Board finds that, pursuant to Section 35(a) of the Act, Joliet has proven that denial of variance would impose an arbitrary or unreasonable hardship. The Board is persuaded that Joliet would suffer a high degree of economic hardship, by denial of variance. The Board also agrees with the Agency that grant of variance involves no significant health risk. The Board is impressed by the City's quick response upon learning of its radium problem, including its immediate and ongoing testing, its investments to enhance its interim blending capabilities, and its commitment to an expensive but long-term solution. The Board encourages Joliet in its effort to seek a common solution with its neighboring towns, but notes that this effort cannot be allowed to unduly extend Joliet's own compliance schedule.

The Board observes that this grant of variance from restricted status will affect only those users who consume water drawn from any newly extended water lines. This variance does not affect the status of the rest of Joliet's population drawing water from existing water lines, except insofar as the variance by its conditions may hasten compliance. Grant of variance may also, in the interim, lessen exposure for that portion of the population which will be consuming more effectively blended water, a significant portion of which water will contain a radium level below the 5 pCi/l regulatory standard. In so saying, the Board emphasizes that it continues to place a high priority on compliance with the radium standards.

For these reasons, variance is granted with conditions in some respects different from those recommended by the Agency. Variance will be granted for five years, but will terminate in 15 months if the compliance plan does not involve the use of Kankakee River water. This five year grant of variance is premised on Joliet's determination that it wishes to achieve compliance by utilizing Kankakee River water. Should another option be chosen, paragraph 6 of the Order provides that this variance will terminate on March 6, 1988, thus giving Joliet 120 days "lead time" to timely petition for another variance utilizing a different compliance plan and schedule.

The Board also has changed a number of other recommended conditions. Paragraph 8 alters the recommended condition so as to provide for any Agency approval or disapproval action to take place in a permit setting; it is inappropriate for the Board to order the Agency to take timely action on a Compliance Report, as recommended, and the condition does not address what would happen if the Agency disapproved. (Agency Rec. p. 13, paragraph (H))

Paragraph 9 alters the recommended condition concerning efforts to utilize a regional water supply, so as to avoid reliance on actions of entities other than the City for compliance. Paragraph 10 rephrases the Agency's recommendation. The schedule in Exhibit 10 indicates that obtaining right-of-way will take place immediately following Agency review and during the same time period as plans and specifications are being prepared, i.e. from March 5, 1988 to August 27, 1989. The Agency condition does not reference any starting date. The Board has rephrased this condition to state that the City will obtain all necessary right-of-way within 18 months of completion of Agency review. Paragraph 11 rephrases the recommendation concerning the bidding process, which was unclear as phrased in the Agency recommendation. (Agency Rec., paragraphs (I), (K) and (L)). If the Board's understanding of the intended time frames in Paragraphs 10 and 11 is incorrect, alternate phrasing should be submitted by way of a Motion for Reconsideration. Other changes reflect similar enforceability concerns.

Finally, the Board notes that, while it respects Mrs. Topolski's concerns regarding possible contaminants other than radium, it would be inappropriate to order the additional testing she requests; this proceeding is limited in scope to combined radium exceedances and, further, Board regulations require Joliet to test for other contaminants in addition to radium, and grant of this variance does not relieve Joliet from that responsibility.

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

ORDER

1. The City of Joliet is hereby granted a variance from 35 Ill. Adm. Code 602.105(a) (Standards of Issuance), and 602.106(b) (Restricted Status) but only as they relate to combined radium-226 and -228, subject to the following conditions:
2. This variance will terminate no later than November 6, 1991. However, this variance will terminate on March 6, 1988, pursuant to paragraph 6 of this Order, in the event that compliance will not be achieved by use of Kankakee River water.

3. In consultation with the Agency, the City of Joliet 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 water from its distribution system, and 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 contaminant 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.
4. Within three months of the grant of the variance, the City of Joliet shall secure professional assistance (either from present staff or an outside consultant) in investigating compliance options, including the possibility and feasibility of achieving compliance by blending water from its existing shallow wells with that of its existing deep wells.
5. Within four months of the grant of the variance, evidence that such professional assistance has been secured shall be submitted to the Agency's Division of Public Water Supplies, FOS, at 2200 Churchill Road, Springfield, Illinois 62606.
6. Within twelve months of the grant of the variance, the City of Joliet shall complete investigating compliance methods, including those treatment techniques described in the Manual of Treatment Techniques for Meeting the Interim Primary Drinking Water Regulations, USEPA, May 1977, EPA-600/8-77-005, and shall prepare a detailed Compliance Report showing how compliance shall be achieved within the shortest practicable time, but no later than eight years from the date of this variance; however, if the compliance plan does not involve the use of Kankakee River water, this variance shall terminate on March 6, 1988.
7. This Compliance Report shall be submitted within thirteen months of the grant of this variance to IEPA, DPWS.
8. Within thirty-four months of the grant of the variance, the City of Joliet shall apply to IEPA, DPWS, Permit Section, for all permits necessary for construction of installations, changes or additions to the City of Joliet's public water supply needed for achieving compliance with the combined radium standard.

9. The City of Joliet may work with area communities or other entities to determine if a regional water supply from the Kankakee River would be the best alternative for achieving compliance, as well as to consider funding mechanisms. Should a regional entity be selected by intergovernmental agreement or by other means to develop a regional water supply, such action shall not relieve Joliet of its obligation to comply with the terms of this variance. These activities shall occur concurrently with the technical requirements embodied in paragraphs 4-7 of this order, and shall be completed before November 6, 1988.
10. Acquisition of property for right-of-way shall begin upon the final routing of the pipe line being established and proceed to completion within 18 months of completion of Agency review.
11. Within three months after each construction permit is issued by IEPA, DPWS, the City of Joliet shall advertise for bids, to be submitted within 60 days, from contractors to do the necessary work described in the construction permit. The City of Joliet shall accept appropriate bids within a reasonable time. Petitioner shall notify IEPA, DPWS of: 1) advertisements for bids, 2) names of successful bidders, and 3) whether Joliet accepted the bids.
12. Construction allowed by 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 combined radium concentration shall begin no later than three and one-half years from the grant of this variance, and shall be completed no later than seven years from the grant of this variance.
13. 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 combined radium-226 and -228.
14. 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 combined radium content in

samples taken since the last notice period during which samples were taken.

- 15. The City of Joliet shall take all reasonable measures with its existing equipment to minimize the level of combined radium-226 and -228 in its finished water.
- 16. The City of Joliet shall provide written progress reports to IEPA, DPWS, FOS every six months concerning steps taken to comply with paragraphs 6, 8, 9, 10, 11, 12 and 15. Progress reports shall quote each of said paragraphs and immediately below each paragraph state what steps have been taken to comply with each paragraph.
- 17. Within 45 days of the date of this Order, the Petitioner shall execute and forward to Mr. Wayne L. 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.

CERTIFICATION

I, (We), _____, having read the Order of the Illinois Pollution Control Board in PCB 86-121, dated November 6, 1986, understand and accept the said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

Petitioner

By: Authorized Agent

Title


Date

18. Mrs. Gisela Topolski's October 20, 1986 Motion is granted. The Board hereby incorporates Mrs. Topolski's Motion into the hearing record as Citizens Exhibit No. 1.

IT IS SO ORDERED.

J. D. Dumelle and B. Forcade dissented.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 6th day of November, 1986, by a vote of 4-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board