

ILLINOIS POLLUTION CONTROL BOARD  
April 7, 1988

LAKE COUNTY PUBLIC WORKS DEPARTMENT, )  
WILDWOOD SUBDIVISION WATER SUPPLY )  
SYSTEM, )  
 )  
Petitioner, )  
 )  
v. ) PCB 87-107  
 )  
ILLINOIS ENVIRONMENTAL PROTECTION )  
AGENCY, )  
 )  
Respondent. )

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

This matter is before the Board on a July 24, 1987 petition for variance filed by the Lake County Public Works Department (County). The County seeks a variance for the Wildwood Subdivision water supply system, which the County owns and operates. The County requests a five-year variance from 35 Ill. Adm. Code 602.105(a) "Standards for Issuance" and from 35 Ill. Adm. Code 602.106(b) "Restricted Status", to the extent these rules relate to the 5.0 pCi/l standard for combined radium-226 and radium-228 (combined radium) contained in 35 Ill. Adm. Code 604.301(a). On August 6, 1987 the Board found the petition deficient for lack of sufficient information, and on September 4, 1987 the County filed its first amended petition. After this filing, the County consulted with the Illinois Environmental Protection Agency (Agency), which asked the County to provide additional technical data. In response to the Agency's request, the County filed its second amended petition on December 17, 1987. The Agency filed its Recommendation in support of grant of variance, subject to conditions, on February 10, 1988. Hearing was waived, and none has been held.

The Wildwood Subdivision is located in an unincorporated area of Lake County, and has a residential population of 8000. The population of the subdivision is projected to increase to 11,000 by the year 2000 and to 15,000 by 2020. The County owns and operates the public water supply which serves the residential population as well as commercial and industrial users. Major customers of this supply include the College of Lake County and the Area Vocational School. The water supply system consists of three deep wells (Wells 2, 4, and 7), three shallow wells (Well 3, 5, and 6), pumps, storage and distribution systems. The current average day demand is approximately 572,000 gallons (397 gallons per minute over a 24-hour delivery period). The current

maximum day demand is 1,172,000 gallons (813 gpm over a 24-hour delivery period). Well 2 is currently on standby status, and was pumped a total of 67.6 hours and 83.7 hours in June 1987 and July 1987, respectively.

By letter dated October 4, 1985, the Agency advised the County that a composite sample indicated that the Wildwood water supply was in violation of the 5.0 pCi/l combined radium 226 and 228 standard. Sampling results showed radium-226 levels of 5.5 pCi/l and radium-228 levels of less than 1.0 pCi/l. On May 23, 1986, the County filed a petition for variance from restricted status to the extent that such status was based on its violation of the combined radium standard of 35 Ill. Adm. Code 604.301(a). On August 14, 1986, the Board granted such variance until August 15, 1987, in PCB 86-75.

Because the variance granted in PCB 86-75 expired without the Wildwood water system coming into compliance with the combined radium standard, the water supply system is again on restricted status. This prohibits the Agency from issuing permits for water main extensions for six proposed and pending developmental projects within Wildwood. These developments are: a) Woodland Hills - a development of townhomes, consisting of 80 units of attached single family residences, b) Woodland Meadows - 60 units of detached single family residences, c) Mariner's Cove - 200 units of detached single family residences, d) Country Squire Village - 250 units of multi-family apartments in conjunction with commercial development, e) Dooley/Towne Development - 140 units of townhomes, f) Tomessen Development - 110 units of townhomes. These 840 proposed housing units are projected to require an additional total flow of 130 gpm or 187,200 gallons per day over a 24 hour delivery period.

#### COMPLIANCE PLAN

As a condition of the previous variance (PCB 86-75), the Board directed the County to secure professional assistance in investigating compliance options, and to submit a report of those options to the Agency. The County secured the services of Morris Environmental Engineering, Inc., which prepared and submitted the compliance report. The County has included that report with the instant petition for variance. Although it is not clear in the record, the County apparently adopts the conclusions and recommendations of that report. In any event, the Board interprets the inclusion of the compliance report, without any disclaimer, as an adoption of the report. The report rejects the following compliance options: a) treatment at point of use or point of entry; b) alternate water sources other than Lake Michigan; c) lime softening; d) ion exchange softening; and e) reverse osmosis. Instead, the compliance report recommends a two-phase program for compliance with the combined radium standard. The first phase would provide compliance through 1995

by a blending program. The second phase would consist of the delivery and use of Lake Michigan water. The County states that Lake Michigan water will be available to Wildwood by 1995.

Due to the fragmented way in which the County's information was submitted, it is difficult to determine the specifics of the County's blending plan. Basically, the plan involves blending water from Wells 4 and 7, which have high radium concentrations, with water from the three wells with low radium concentrations (Wells 3, 5, and 6) and water from two new shallow wells. These new shallow wells would pump 200 gpm, and would be located adjacent to existing Wells 2 and 4. As set forth by the Agency, the County proposes the following plan:

- a. Water from Wells Nos. 3 and 7 would be blended with static mixers, with Well No. 7 throttled or modified to discharge at 140 gpm (maximum radium concentration) or 252 gpm (average radium concentration).
- b. Well No. 4 would be throttled to 162 gpm (maximum RC) or 270 gpm (average RC), and water from Well No. 4 would be blended with static mixers with a proposed 200 gpm shallow well to be installed at the Well No. 4 site.
- c. Either Well No. 5 or Well No. 6 would be used.
- d. Pump controls respectively for Well No. 3 and Well No. 7 and Well No. 4 and the proposed shallow well would be interlocked to prevent the operation of Well No. 7 and Well No. 4 when either Well No. 3 or the new shallow well is out of service.

This blending plan is the third call in the following pumping and blending sequence:

- a. First Call --- Wells No. 3, 5 or 6
- b. Second Call --- Wells No. 3, 5 or 6 and 7
- c. Third Call --- Wells No. 3, 4, 5 or 6, 7 and a new shallow well
- d. Fourth Call --- Wells No. 3, 4, 5 or 6, 7 and two new shallow wells

This County currently uses these first and second calls to meet its average day demand, and uses the third call (with the exception of the proposed shallow well) to meet current maximum day demand. The County projects that this blending method would produce a total capacity of 992 gpm (1.43 million gallons per day (MGD)) with an estimated combined radium concentration (CRC) of 4.49 pCi/l in the distribution system, under average radium concentrations in Wells 4 and 7. Under maximum CRC in Wells 4 and 7, the County estimates that the blending plan will produce a total capacity of 772 gpm (1.11 MGD) with an estimated CRC of

4.35 pCi/l in the distribution system. The County apparently does not plan to use the fourth call, with the second new well, until 2000. It is not stated when the second well is to be constructed.

The County calculates that the total capital cost to implement the blending plan is \$248,000. The estimated annual cost, including energy, maintenance, chemicals, and labor expense is \$54,000. It is unclear whether these estimates include the costs of the second shallow well at the Well 2 site. The addition of the shallow well at the Well 4 site will take approximately 14 months to complete, from the preparation of the preliminary design through final construction.

The Agency believes that the blending plan has "a reasonable chance of success if [the County] maintains proper control of all wells." Agency Rec. at 16. The Agency particularly states that the County must insure that water from Wells 4 and 7 is properly blended before those wells are activated. However, the Agency does express several concerns about the proposed blending plan. First, the Agency notes that the radium concentration appears to increase with higher pumping rates, and thus recommends that the maximum CRC be used to establish the blending rate from Wells 4 and 7, rather than the average CRC suggested by the County. The Agency does not dispute the County's estimates that the third call blending sequence would result in levels of combined radium less than the 5.0 pCi/l standard whether blended at average CRC (4.49 pCi/l) or maximum CRC (4.35 pCi/l). This concern leads to the second issue raised by the Agency: that the total capacity of the third call blending sequence under maximum CRC (772 gpm) will not meet the projected maximum day demand in 1995 (819 gpm). Therefore, the Agency states that the County should be able to meet the 1995 maximum day demand through the fourth call by 1995 instead of 2000.

The Board recognizes these two concerns raised by the Agency. However, since figuring the blending rates on either average CRC or maximum CRC will result in levels of combined radium less than the 5.0 pCi/l standard, the Board feels that the County should be given the flexibility to meet that standard in the manner in which it sees fit. The County is cautioned, of course, that it must accomplish both goals: meet the combined radium standard while providing sufficient total capacity to meet maximum day demand.

The second phase of the County's compliance plan is the delivery and use of Lake Michigan water by 1995. On February 28, 1981, the County received a Lake Michigan Allocation Permit, effective from 1985 through 2020. In April 1982, the County and six municipalities established the Central Lake County Water Supply Committee. The County states that it has contributed a total of \$45,000 to the committee and its successor, the Central

Lake County Joint Action Water Agency (JAWA). JAWA has retained engineers to evaluate long term alternatives for obtaining Lake Michigan water, and has hired a financial consultant to assist in implementing the Lake Michigan water allocation. The members of JAWA are considering an Interim Water Supply Contract which would authorize the issuance of \$4,250,000 in revenue notes to finance the design of a system to deliver Lake Michigan water to control Lake County, including Wildwood. The County states that Lake Michigan water will be available to Wildwood by 1995, and perhaps earlier. The construction of facilities to receive Lake Michigan water has an estimated total capital cost of \$3,290,000.

#### ENVIRONMENTAL IMPACT

The County has not made any formal assessment of the effect of the requested variance on the environment, but refers both the Board and the Agency to the testimony and exhibits presented by Richard E. Toohey, Ph.D. and James Steffings, Ph.D., both of the 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. The County does state its belief that the granting of this variance will not cause any significant harm to the environment or to the people served by potential water main extensions.

The Agency states that while radiation at any level creates some risk, the risk associated with this level is very low. The Agency notes that the maximum allowable concentration for combined radium is currently under review at the federal level, but states that it does not expect any proposal to change the standard in 1988. In sum, the Agency believes that an incremental increase in combined radium should cause no significant health risk for the limited population served by new water main extensions for the time period of the recommended variance.

#### HARDSHIP

The County contends that it would suffer an arbitrary and unreasonable hardship if the variance is denied. The County points out that all construction in the Wildwood area which requires extension of the water supply system would be halted. Furthermore, the County maintains that the construction of treatment facilities would be impractical due to the cost, especially in view of the County's on-going plan to convert to Lake Michigan water. The County asserts that any special treatment facilities which would be built would be rendered useless by the conversion to Lake Michigan water.

The Agency states that in light of the cost of treatment of the current water supply, the likelihood of no significant injury to the public from continuation of the present level of combined

radium for the period of the variance, and the "possibility" of compliance with the combined radium standard through blending, it concludes that denial of the variance would impose an arbitrary or unreasonable hardship on the County.

#### CONCLUSIONS

As previously stated in PCB 86-75, the Board finds that the County would incur an arbitrary or unreasonable hardship if a variance is not granted. The County's two-phase compliance plan should lower the combined radium concentration of the water supply system to a level below the 5.0 pCi/l standard. Therefore, the Board will grant the requested five-year variance, subject to conditions. However, the Board will tighten the interim deadlines suggested by the Agency. For example, the record contains no reason why the County should wait two years before applying to the Agency for construction permits for its blending program. The Board wishes to stress that this variance is granted on the condition that the County make all efforts at compliance through the blending plan. The County is not to delay initiation of the blending plan while waiting for Lake Michigan water.

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

#### ORDER

The Lake County Public Works Department (County), Wildwood Subdivision Water Supply System, 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 the combined radium-226 and radium-228 standard of 35 Ill. Adm. Code 604.301(a), subject to the following conditions:

1. This variance expires on April 7, 1993, or when analysis pursuant to 35 Ill. Adm. Code 605.105(a) shows compliance with the standard for combined radium, whichever occurs first.
2. In consultation with the Agency, the County 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, the County shall collect quarterly samples of its water from its distribution system, at the same designated locations each quarter, shall composite the quarterly samples for each specified location separately, and shall analyze them annually by a laboratory certified by the State of Illinois for radiological analysis so as to determine the concentration of combined radium.

The results of the analyses shall be reported to the Compliance Assurance Section, Division of Public Water Supplies, IEPA, 2200 Churchill Road, Springfield, Illinois 62794-9276, within 30 days of receipts of each analysis. At the option of the County, 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 quarterly sample.

3. The County shall continue to take all necessary steps to obtain Lake Michigan water by 1995 and shall:
  - a) participate actively in the Central Lake County Joint Action Water Agency;
  - b) pay all costs and contributions associated with its efforts to obtain Lake Michigan water;
  - c) negotiate with shoreline municipalities to acquire Lake Michigan water;
  - d) assist retained consultants and engineers to implement the Lake Michigan water system.
4. Within nine months of grant of the variance, unless there has been a written extension by the Agency, the County shall apply to IEPA, DPWS, Permit Section, for all permits necessary for construction of modifications and additions to Wells No. 2, 4 and 7 and installation of shallow wells at the sites of Wells Nos. 2 and 4 and other installations, changes or additions to the County's public water supply needed for achieving compliance with the standard for combined radium.
5. Within three months after each construction permit is issued by IEPA, DPWS, the County shall advertise for bids, to be submitted within 60 days, from contractors to do the necessary work described in the construction permit. The County shall accept appropriate bids within a reasonable time. The County shall notify IEPA, DPWS, within 30 days, of each of the following actions: 1) advertisements for bids, 2) names of successful bidders, and 3) whether the County accepted the bids.
6. 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 standard for combined radium shall begin no later than two years from the grant of this

variance and shall be completed no later than three years from the grant of this variance.

7. Failure to meet any of the dates in paragraphs 4, 5 and 6 shall result in termination of this variance.
8. 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, the County will send to each user of its public water supply a written notice to the effect that the County 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 standard for combined radium.
9. 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, the County will send to each user of its public water supply a written notice to the effect that the County is not in compliance with the standard for combined radium. The notice shall state the average content of combined radium in samples taken since the last notice period during which samples were taken.
10. Until full compliance is reached, the County shall take all reasonable measures with its existing equipment to minimize the level of contaminant in question in its finished drinking water.
11. The County shall provide written progress reports to IEPA, DPWS, FOS every six months concerning steps taken to comply with paragraphs 3, 4, 5, 6, and 9. Progress reports shall quote each of said paragraphs and immediately below each paragraph state what steps have been taken to comply with each paragraph.
12. Within 45 days after the date of this Opinion and Order the County shall execute and send to:

Illinois Environmental Protection Agency  
Attention: Jose L. Gonzalez, Jr.  
Enforcement Programs  
2200 Churchill Road  
Springfield, Illinois 62794-9276

a certificate of acceptance of this variance by which it agrees to be bound by the terms and conditions contained herein. This variance will be void if the County fails to execute and forward the certificate within the 45 day



period. The 45 day period shall be in abeyance for any period during which the matter is appealed. The form of the certification shall be as follows:

CERTIFICATION

I, (We), \_\_\_\_\_, having read the Opinion and Order of the Illinois Pollution Control Board, in PCB 87-107, dated April 7, 1988, understand and accept the said Opinion and Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

\_\_\_\_\_  
Petitioner

\_\_\_\_\_  
By: Authorized Agent

\_\_\_\_\_  
Title

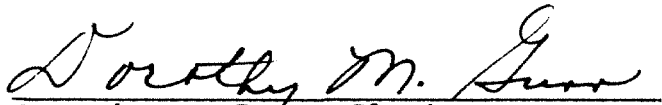
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Date

13. Section 41 of the Environmental Protection Act (Ill. Rev. Stat. 1985, ch. 111<sup>1</sup>/<sub>2</sub>, par. 1041) provides for appeal of final Orders of the Board within 35 days. The Rules of the Supreme Court of Illinois establish filing requirements.

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 7<sup>th</sup> day of April, 1988, by a vote of 5-2.

  
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Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board