

ILLINOIS POLLUTION CONTROL BOARD
June 10, 1987

CITY OF LOCKPORT)	
)	
Petitioner,)	
)	
v.)	PCB 87-16
)	
ILLINOIS ENVIRONMENTAL)	
PROTECTION AGENCY,)	
)	
Respondent.)	

OPINION AND ORDER OF THE BOARD (by R. C. Flemal):

This matter comes before the Board on the petition for variance filed on February 17, 1987, by the City of Lockport ("Lockport"). Lockport seeks a five year variance from 35 Ill. Adm. Code 602.105(a) "Standards For Issuance" and 602.106(b) "Restricted Status" to the extent those rules relate to the exceedence by Lockport's public water supply of the 5 picocuries per liter ("pCi/l") combined radium-226 and radium-228 standard of 35 Ill. Adm. Code 604.301(a) and the 15 pCi/l gross alpha particle activity standard of 35 Ill. Adm. Code 604.301(b).

On March 27, 1987, the Illinois Environmental Protection Agency ("Agency") filed a Recommendation in support of grant of variance subject to conditions. On April 2, 1987, the Agency filed a motion requesting that its Recommendation be accepted instanter. That motion is granted. On April 8, 1987, Lockport filed a response to the Agency's Recommendation, in which it accepted each and every condition recommended by the Agency. On June 9, the Board received additional Agency comments which provided the USEPA perspective on variances of this type. Hearing was waived and none was held.

Lockport provides potable water supply and distribution for a population of 3,035 residential and 245 industrial, governmental, and commercial customers representing a population of 9,800. Lockport currently has four wells, as follows:

<u>Well No.</u>	<u>Depth</u>	<u>Placed in Operation</u>	<u>Gallons Per Minute</u>	<u>Location</u>
2	1550 feet	1927	750	Commerce St
3	1571 feet	1940	(not in use)	E. 14th St
4	1572 feet	1954	950	S. Madison St
5	330 feet	1973	400	Farrell Rd

Lockport was first advised of the high radium content in its water supply by letter from the Agency dated October 4, 1985, and was first notified of placement on restricted status by letter from the Agency dated December 19, 1985. The Agency based its determination on four quarterly analyses showing an average radium-226 content of 10.5 pCi/l and an average radium-228 content of 1.2 pCi/l, for a combined average of 11.7 pCi/l. A subsequent single analysis, reported by the Agency in December 1986, showed that radium-226 was 13.1 pCi/l and radium-228 was 4.2 pCi/l, for a combined total of 17.3 pCi/l.

Lockport was first advised of the excess gross alpha particle activity in its water by letter from the Agency dated October 17, 1980. The letter indicated gross alpha particle activity of 21.4 pCi/l. Subsequent analyses, as provided by Petitioner, showed the following results, in pCi/l:

<u>Date</u>	<u>Results</u>	<u>Address</u>
07-01-81	23.0 ± 5.11	1134 State St.
09-15-81	25.3 ± 4.59	unknown
03-12-82	25.8 ± 5.22	103 W. 17th St.
06-14-82	15.4 ± 4.89	1422 Sisson St.
09-01-82	13.2 ± 5.17	718 Cove St.
02-17-83	14.4 ± 4.17	1422 Sisson St.
04-05-83	9.1 ± 5.55	1422 Sisson St.
07-19-83	11.4 ± 3.59	1422 Sisson St.
09-29-83	7.8 ± 3.55	1422 Sisson St.
12-06-83	29.7 ± 5.87	1422 Sisson St.
04-25-84	23.8 ± 5.36	718 Cove St.
07-31-84	20.7 ± 5.04	718 Cove St.
10-02-84	19.7 ± 4.47	1422 Sisson St.
01-03-85	12. ± 3.	555 E. 3rd St.
04-01-85	7. ± 4.	1422 Sisson St.
10-29-85	20. ± 4.	1422 Sisson St.
03-11-86 ¹	12. ± 4.	555 E. 3rd St.

REGULATORY FRAMEWORK

In recognition of a variety of possible health effects occasioned by exposure to radioactivity, the U.S. Environmental Protection Agency has promulgated maximum concentration limits for drinking water of 5 pCi/l of combined radium-226 and radium-228 and 15 pCi/l gross alpha particle activity. Illinois subsequently adopted the same limits as the maximum allowable concentrations under Illinois law.

¹ A second analysis on the sample taken this day, available to the Agency but not reported to Petitioner, showed a gross alpha activity level of 15 ± 5 pCi/l (Agency Recommendation, p. 4).

However, the action that Lockport requests here is not variance from these two maximum allowable concentrations. Irrespective of the action taken by the Board in the instant matter, these standards will remain applicable to Lockport. Rather, the action Lockport requests is the temporary lifting of prohibitions imposed pursuant to 35 Ill. Adm. Code 602.105 and 602.106. In pertinent part these sections read:

Section 602.105 Standards for Issuance

- a) The Agency shall not grant any construction or operating permit required by this Part unless the applicant submits adequate proof that the public water supply will be constructed, modified or operated so as not to cause a violation of the Environmental Protection Act (Ill. Rev. Stat. 1981, ch. 111^{1/2}, pars. 1001 et seq.) (Act), or of this Chapter.

Section 602.106 Restricted Status

- a) Restricted status shall be defined by the Agency determination pursuant to Section 39(a) of the Act and Section 602.105, that a public water supply facility may no longer be issued a construction permit without causing a violation of the Act or this Chapter.
- b) The Agency shall publish and make available to the public, at intervals of not more than six months, a comprehensive and up-to-date list of supplies subject to restrictive status and the reasons why.
- c) The Agency shall notify the owners or official custodians of supplies when the supply is initially placed on restricted status by the Agency.

Illinois regulations thus provide that communities are effectively prohibited from extending water service, by virtue of not being able to obtain the requisite permits, if their water fails to meet any of the several standards for finished water supplies. This provision is a feature of Illinois regulations not found in federal law. It is this effective prohibition which Lockport herein requests be lifted.

The Board has become increasingly reluctant to grant lengthy variances from restricted status which provide time for the development and actual implementation of a compliance plan. Some communities have abused such variances by ignoring conditions and failing to make progress toward compliance. The Board has responded to this situation by occasionally granting short-term

variances (without an ultimate compliance date) on the assumption that a community will be more likely to make progress toward actual compliance if it must come back for a variance extension for time to complete the compliance plan. In the event that progress was not being made, the extension could be denied by the Board.

The Agency's June 9 comment addressed several problems inherent in current Agency, USEPA, and Board procedures and suggests an alternative. As noted above, a variance from restricted status does not constitute a variance from the standards in question. As pointed out in the Agency comment:

A Petitioner with only a Restricted Status variance is still subject to the possibility of enforcement for violation of the national primary drinking water standard. But if a variance order does include enforceable interim milestones and a fixed compliance date, then the State has been deemed by U.S. EPA to have "commenced appropriate enforcement action". Neither the State nor U.S. EPA must take further enforcement action against the supply for violating the national primary drinking water standard for which the supply obtained a Restricted Status variance which includes those items.

It should be noted that both the U.S. EPA and the IEPA will be closely tracking compliance with the enforceable interim milestones and the fixed compliance date of a variance order. Any significant deviation from them will result in an enforcement response from either U.S. EPA or the IEPA to the supply.

The Agency comment states that it met several times with the USEPA and has had several staff meetings (as late as June 5) to discuss this matter. The Agency and USEPA have essentially agreed to address this issue by using the Agency's "enhanced enforcement program". According to the Agency comment:

Pursuant to this program, Enforcement Notice Letters will be mailed periodically to various groups of supplies which are in violation of one or more national primary drinking water standards. They will be asked to sign Letters of Commitment, i.e., agreements to prepare engineering reports and compliance plans. With the concurrence of Illinois Attorney General's Office, the compliance plans approved by IEPA will then be submitted to the Board for its approval

and for the entry of Board orders that contain enforceable interim milestones and a fixed compliance date.

Supplies that have variances or obtain variances containing enforceable interim milestones and a fixed compliance date and which do not have other significant violations need not be part of the Agency's enhanced enforcement program.

Hence, each supply violating any national primary drinking water regulation will eventually be under a Board approved enforceable compliance order, either an enforcement proceeding order or a variance proceeding order. The State will have "commenced appropriate enforcement action" against all supplies consistent with the requirements of the SDWA.

COMPLIANCE ALTERNATIVES

Lockport has not, as of this time, committed to a specific compliance plan. Rather, it is considering four general options, as follows:

- (A) Using existing or new wells for blending purposes;
- (B) Utilizing Lake Michigan water, which would replace water presently being supplied by wells;
- (C) Constructing treatment facilities;
- (D) Utilizing the Kankakee River as a new source of water and developing it as a regional system with other communities such as the City of Joliet.

Lockport asserts that it is its intention to retain an outside consultant to assist in reviewing and evaluating the compliance options and to prepare recommendations. The timetable for this task has not yet been developed, and Petitioner does not expand upon the possible alternatives other than to note the negative aspects of lime-soda softening and ion exchange as treatment alternatives. Both methods concentrate radium in the sludge, causing waste disposal and handling difficulties and expenses; the ion exchange method also concentrates sodium in the finished water, which can pose health risks to persons with hypertension or heart problems.

The Agency is more expansive regarding compliance possibilities, noting in particular several current and promising developments in the area of treatment methods:

To provide help for small communities, a long-term, USEPA-funded project has been undertaken to evaluate the single contaminant removal processes (activated alumina and ion exchange) versus the desalting processes (electro-dialysis with reversal and reverse osmosis). To accomplish this project, contaminated water sources in a series of small U.S. communities are being studied with the use of a mobil drinking water treatment research facility.

The objectives of the pilot-scale studies conducted at the Mobile Drinking Water Treatment Research Facility in Lemont and the bench-scale research undertaken at the University of Houston include the following:

1. To evaluate RO (reverse osmosis), IX (ion exchange), EDR (electro-dialysis with reversal) and specific adsorbents for the treatment of Lemont and similar small-community water supplies for the removal of radium, and to a lesser extent barium.
2. To obtain valid design and cost information for the scale-up of these processes.
3. To develop recommended means for the most economical operation of each of these processes, i.e. to establish: pretreatment requirements for all processes, bypass water allowances for all processes, types of adsorbents including Isoclear beads, acid-regenerated filter sand (Valentine's method) and Dow radium selective adsorbent, type of resins, optimum detention times and capacity changes during cyclic operation, regenerant dosage, concentration and flow direction (cocurrent or countercurrent) and types of membranes including polyamide, thin film composite, and cellulose triacetate.
4. To evaluate radium removal efficiency of point-of-use treatment systems consisting of cellulose acetate and thin-film composite RO modules.
5. To make a techno-economic comparison of RO, IX, EDR and specific adsorbents for central treatment.

This study began in January, 1987 and will end in mid-March, 1988, according to Dr. Dennis Clifford Prof. Eng., Associate Professor and Director, Environmental

Engineering Program of the Department of Civil Engineering, The University of Houston-University Park, Houston, TX 77004.

A second study may be done by Iso-Clear Systems Corporation of Yorkville, Illinois which says it has developed a product for the efficient removal of Radium from drinking water. The material is used in packed vertical columns, through which the drinking water is passed. As the water passes through the column, Radium is adsorbed into the resin and retained. Iso-Clear is currently negotiating with the State of Illinois to establish design parameters for full-scale usage. A mobile trailer mounted pilot plant is proposed which would allow testing water from various municipalities. The Agency has been informed it would take about six months to complete the study but the starting date is uncertain as it is dependent on the company getting a state grant for the study.

Since the Iso-Clear method may be a viable compliance method, the Petitioner should not have to proceed with more expensive alternatives but rather should wait for the results of this method's investigation, if finished relatively soon.

Agency Recommendation, p. 6-8.

HARDSHIP

Lockport believes that a requirement to come into immediate compliance would impose an arbitrary or unreasonable hardship. It also notes that by virtue of its inability to receive permits for water main extensions, needed expansion of the water system to serve the domestic and fire protection requirements of the local population are forestalled, and that prospective home purchasers and business developers have been hurt. As specific examples, Petitioner currently foresees the need to extend water mains to serve the following new users:

- A. Wilhelmi farm development to be located on 7th Street in Lockport, consisting of 113 acres in size. The owner contemplates building 283 residential units and 80 apartment units, and plans on utilizing 10 acres for commercial development. Each house would have a separate hookup to the proposed water main.
- B. Lutheran Unity Village, to be located on Briggs Street in Lockport, encompassing 36 acres. It is

a ten year, \$25 million project designed to meet the residential and nursing care needs of 500 senior citizens.

ENVIRONMENTAL AND HEALTH EFFECTS

As to the environmental and health affects of its request, Lockport asserts that it believes that grant of variance will impose no significant health risk to persons who will receive water from the new service connections during the term of this variance. In support of this belief, Lockport refers the Board to the testimony and exhibits presented by Richard E. Toohey, Ph.D. and James Stebbings, Ph.D., both of Argonne National Laboratory, at the hearing held on July 30 and August 2, 1985 in R85-14, Proposed Amendments to Public Water Supply Regulations, 35 Ill. Adm. Code at 602.105 and 602.106.

The Agency does not dispute Lockport's various assertions regarding health affects. The Agency believes that while radiation at any level creates some risk, the risk associated with Lockport's water is low. Moreover, the Agency believes that "an incremental increase in the allowable concentration of the contaminants in question even up to a maximum of four times the level of the maximum allowable concentrations ("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" (Id., p. 6). In conclusion the Agency states:

The Agency believes that the hardship resulting from denial of the recommended variance from the effect of being on Restricted Status would outweigh the injury of the public from grant of that variance. In light of the cost to the Petitioner of treatment of its current water supply, the likelihood of no significant injury to the public from continuation of the present level of the contaminant in question in the Petitioner's water for the limited time period of the variance, and the possibility of compliance with the MAC standard due to blending or new shallow wells, etc., the Agency concludes that denial of a variance from the effects of Restricted Status would impose an arbitrary or unreasonable hardship upon Petitioner.

The Agency observes that this grant of variance from restricted status should affect only those users who consume water drawn from any newly extended water lines. This variance should not affect the status of the rest of Petitioner'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. In so saying, the Agency emphasizes that it continues to place a high priority on compliance with the radium standards.

Id., p. 12.

CONCLUSION

The Board finds that, in light of all the facts and circumstances of this case, denial of variance would impose an arbitrary or unreasonable hardship upon Petitioner. The Board also agrees with the Agency that no significant health risk will be incurred by the persons who are served by any new water main extensions, assuming that compliance is timely forthcoming.

Nevertheless, the Board is concerned about Lockport's apparent lack of progress in bringing about compliance, and therefore questions whether the assumption that compliance will be timely is warranted. Lockport has known of its gross alpha problem since October 1980, a period of over six years, and of its combined radium problem since October, 1985, a period of a year-and-a-half. This notwithstanding, all Lockport offers is four general compliance possibilities, three of which it does nothing more than list, and the fourth of which it discusses only to the extent of apparently dismissing two options. The Board would have liked to have seen a greater manifestation of Lockport's sincerity about achieving compliance than this meager action to date implies.

Given these circumstances, the Board does not believe that the full five-year variance, as requested, is justified at present. Rather, the Board will grant variance until December 31, 1990, subject to those conditions proposed by Lockport and the Agency which are germane to the development of and commitment to a compliance plan. In selecting this period, the Board is taking into consideration the Agency's recommendation that eighteen months be allowed for investigation of compliance, given the present activity in testing of new treatment options (Agency Recommendation, p. 6-8).

In reviewing the Agency comment, the Board notes that its charge is to see that the Act and the Board's rules and regulations are complied with most efficaciously, whether this be via enforcement action or via some other means. Thus, that a Petitioner may be insulated from enforcement by grant of variance is totally incidental to the overriding concern of having Lockport commit to and achieve compliance. The Agency's newly established "enhanced enforcement program" should be adequate to achieve this goal. Under this arrangement, the petition can expand its water supply but must make steady progress toward compliance or face enforcement. In addition, the petitioner meets the requirements necessary to prevent federal enforcement of the standards as long as progress is made toward compliance by a date certain.

As a final matter, the Board also notes all analyses of gross alpha particle activity have been conducted on samples taken from the distribution system. Although no information has been provided regarding where the combined radium samples were collected, it is assumed that these also have been collected from the distribution system. Since prior experience has shown that distribution system concentrations of the radiological parameters can vary widely, depending in part on the particular mix of wells serving any point at any given time, it is impossible from the data presently available to evaluate the extremes of concentration which may exist system-wide. Accordingly, the Board will additionally order that, during the term of the variance, Lockport conduct analyses of its water both at the well head and within the distribution system.

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

ORDER

1. Petitioner, the City of Lockport, is hereby granted 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 5 pCi/l combined radium-226 and radium-228 standard of 35 Ill. Adm. Code 604.301(a) and the 15 pCi/l gross alpha particle activity standard of 35 Ill. Adm. Code 604.301(b), subject to the following conditions:
 - (A) This variance expires on December 31, 1990, or when compliance with 35 Ill. Adm. Code 604.301(a) and (b) is achieved, whichever is sooner.
 - (B) In consultation with the Agency, Petitioner shall continue its sampling program to determine as accurately as possible the level of radioactivity in each of its wells and finished water. Until this variance expires, Petitioner shall collect quarterly samples of its water from its distribution system and from each of its two operating deep wells, composite them separately, and have them analyzed annually by a laboratory certified by the State of Illinois for radiological analysis so as to determine the concentration of the three parameters, radium-226, radium-228, and gross alpha particle activity. The results of the analyses shall be reported to the Compliance Assurance Section, Division of Public Water Supplies, 2200 Churchill Road, IEPA, Springfield, Illinois 62794-9276, 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.

- (C) Compliance shall be achieved with the maximum allowable concentrations of combined radium-226 and radium-228 and with gross alpha particle activity no later than December 31, 1990.
- (D) Within three months of the grant of this variance, Petitioner shall secure professional assistance (either from present staff or an outside consultant) in investigating compliance options.
- (E) Within four months of the grant of this 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 62706.
- (F) Within 18 months of the grant of this variance, Petitioner shall complete its investigation of 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 submit to IEPA, DPWS, a detailed Compliance Report showing how compliance shall be achieved within the shortest practicable time, but no later than December 31, 1990.
- (G) Within 22 months of the grant of the variance 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 contaminants in question.
- (H) Within three months after each construction permit is issued by IEPA, DPWS, the Petitioner shall advertise for bids, to be submitted within 60 days, from contractors to do the necessary work described in the construction permit. The Petitioner shall accept appropriate bids within a reasonable time. Petitioner shall notify IEPA, DPWS, within 30 days of each action, of: 1) advertisements for bids, 2) names of successful bidders, and 3) whether Petitioner accepted the bids.
- (I) 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 concentrations in question shall begin not later than thirty months from grant of this variance and shall be completed no later than three years from the grant of this variance.

- (J) 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 standards in question.
 - (K) 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 standards in question. The notice shall state the average content of the contaminants in question in samples taken since the last notice period during which samples were taken.
 - (L) Petitioner shall take all reasonable measures with its existing equipment to minimize the level of contaminants in question in its finished water.
 - (M) Petitioner shall provide written progress reports to IEPA, DPWS, FOS every six months concerning steps taken to comply with paragraphs F, G, H, I and L. Progress reports shall quote each of the above paragraphs and immediately below each paragraph shall state what steps have been taken to comply with each paragraph.
2. Within forty-five days of the date of this Order, Petitioner shall execute and forward to Wayne L. Wiemerslage, Enforcement Programs, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706, a Certificate of Acceptance and Agreement to be bound by 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 said Certification shall be as follows:

CERTIFICATION

I, (We), _____, having read the Order of the Illinois Pollution Control Board, in PCB 87-16, dated June 10, 1987, understand and accept the said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

Petitioner

By: Authorized Agent

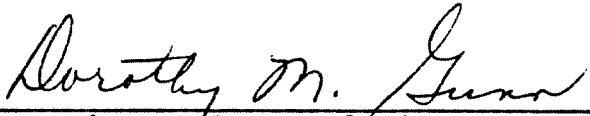
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Date

IT IS SO ORDERED.

Board Members Jacob D. Dumelle and Bill Forcade dissented,
and Joan Anderson concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control
Board, hereby certify that the above Opinion and Order was
adopted on the 10th day of June, 1987, by a vote
of 4-2.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board