

ILLINOIS POLLUTION CONTROL BOARD
August 6, 1987

IN THE MATTER OF:)
)
PROPOSED AMENDMENTS)
TO 35 ILL. ADM. CODE) R 86-17(A)
304.120, DEOXYGENATING)
WASTES STANDARDS)
)

ADOPTED RULE. FINAL ORDER.

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

This matter comes before the Board upon a proposal by the Illinois Environmental Protection Agency (Agency) to amend 35 Ill. Adm. Code 304.120, Deoxygenating Wastes, filed with the Board on April 23, 1986. Hearings on this proposal were held by the Board on June 24, 1986 at Peoria (generating a transcript hereinafter referred to as RI) and June 27, 1986 at Effingham (generating a transcript hereinafter referred to as RII). On January 5, 1987, the Department of Energy and Natural Resources (DENR) filed with the Board its negative declaration. The DENR stated that "[t]he net economic impact of the regulation is favorable and the costs of compliance are small or are borne entirely by the proponent of the regulation." The Economic and Technical Advisory Committee concurred with DENR's finding that economic impact studies were not necessary in this matter. By a letter dated December 15, 1986, DENR requested that the record in this matter remain open until January 23, 1987 so that DENR could submit two exhibits which would "aid the Board in its deliberations." By a Hearing Officer Order dated December 19, 1986, the record was held open until February 25, 1987 to allow interested persons to comment upon the two DENR exhibits which were filed with the Board on January 23, 1987.

By its Order of March 5, 1987, the Board sent part of the Agency's proposal to First Notice and opened Docket B to consider the remaining aspects of the Agency's proposal. The Board's proposed rule appeared in the Illinois Register on March 27, 1988. 11 Ill. Reg. 5011.

During the First Notice period, the Board received one public comment concerning the proposed rule. Citizens Utilities Company of Illinois (Citizens) filed a comment on April 24, 1987, which requested that the Board's proposed rule include wastewater treatment works of investor-owned utilities. That is, Citizens would like privately owned treatment facilities to qualify for a lagoon exemption if it has an untreated waste load between 2500 and 5000 population equivalents. The rule applies only to a publicly owned treatment works (POTW). The Board notes that Citizen's comment merits consideration, and the Board will explore this issue further under Docket B.

On May 28, 1987, the Board adopted the proposed rule for Second Notice. The Second Notice period began on June 10. On July 22, the Joint Committee on Administrative Rules voted an objection to the proposed rule because of the Board's failure to provide "adequate standards used to determine when a publicly owned treatment works has reached the end of its 'useful life'." In response to that objection, the Board has modified the previous version of the rule so as to include an additional subsection further defining the term useful life. The Board will adopt, as final, this modified version of the rule.

The Agency proposal essentially requests that the Board expand the lagoon exemption of Section 304.120 to include publicly owned treatment works (POTW) whose untreated waste load is less than or equal to 5000 population equivalents (p.e.). The current regulation allows an exemption for any waste treatment facility whose untreated waste load is less than 2,500 p.e. provided other exemption requirements are satisfied. The current and proposed lagoon exemption applies only to effluents whose dilution ratio is less than five to one. If a facility qualifies for an exemption, it is exempt from the requirements that the effluent not exceed 10 milligrams per liter (mg/l) biochemical oxygen demand (BOD₅) as well as 12 mg/l suspended solids. Instead, the exempted facility would be subject to limits of 30 mg/l BOD₅ and 37 mg/l suspended solids.

The Agency proposal changes the requirements for a source to qualify for such an exemption. Under the proposal, several of the current exemption requirements are unaltered. First, a source must employ third-stage treatment lagoons. Secondly, the lagoons must be properly constructed, maintained and operated. Also, in order to qualify for an exemption, an effluent's deoxygenating constituents must not, alone or in combination with other sources, cause a violation of the applicable dissolved oxygen standard. The Agency's proposal seeks to change the requisite factors dealing with population equivalents. The language of the proposal requires that the source qualify under one of the following three categories.

- 1) Any wastewater treatment works whose untreated waste load is less than 2500 p.e. and is sufficiently isolated that combining with other sources to aggregate 2500 p.e. or more is not practicable.
- 2) Any publicly owned treatment works in existence on January 1, 1986 whose untreated waste load is 5000 p.e. or less and sufficiently isolated that combining to aggregate 5000 p.e. or more is not practicable.
- 3) Any publicly owned treatment works whose untreated waste load is 5000 p.e. or less which has reached the end of its useful life and is sufficiently isolated that combining to aggregate 5000 p.e. or more is not

practicable.

The current regulation contains only the first category.

It is the Agency's position that a p.e. maximum of 5000 equates with the concept of a small town lagoon exemption better than the current maximum of a 2500 p.e.. According to the Agency, POTW's serving communities with a population greater than 5000 generally do not utilize lagoons. (R II. 5, 48).

The Agency asserts that the alternative to lagoon use is the employment of mechanical treatment systems, such as an activated sludge filter system. Mechanical treatment systems have the ability to produce an effluent that is within 10 mg/l BOD₅ and 12 mg/l suspended solids. However, the Agency states that small towns often do not operate these systems properly and that as a result performance levels decline. (R II. 13). On the other hand, the Agency asserts that lagoon systems, although often not capable of maintaining 10/12 standard, are more forgiving when subject to less than adequate operational attention. That is, the lagoon system provides a more consistent and stable performance with a less than sophisticated operator. (R II. 24-5).

The mechanical treatment systems are generally more expensive to build and operate than lagoon systems. The Agency claims that the current exemption limitation of 2500 p.e. does not take into account the economic hardship of small communities which are faced with utilizing the more costly mechanical treatment systems in order to achieve the 10/12 standard. According to the Agency, the communities between a 2500 and 5000 p.e. level were once able to take advantage of federal and state grants. However, the Agency states that such grants have dried up and that only low interest loans are available for these communities. As a consequence, communities within the 2500 to 5000 p.e. level must now bear the full capital and operational costs of their wastewater treatment systems. (R I. 6). It is the Agency's position that the economic burden of requiring communities of 5000 p.e. and under to utilize mechanical treatment facilities is unjustified. The Agency believes that 5000 p.e. is a logical upper limit for the lagoon exemption since almost all POTW's treating more waste have chosen mechanical systems, probably due to economies of scale. (R II. 48).

The Board notes that the Agency's proposal would not exempt private wastewater treatment works which operate at levels between 2500 and 5000 p.e. The current regulation allows an exemption for private facilities that operate below 2500 p.e. It is the Agency's position that an expansion of the exemption for private facilities is unnecessary. According to the Agency, the private facilities have had a better compliance record when compared with POTW's of similar size. The Agency also states that the technical ability of the private operators as well as the private facilities' ability to pass cost on to the customer

are important factors which distinguish private wastewater treatment works from POTW's. Therefore, private facilities are not included in the Agency's proposed expansion of the lagoon exemption. (R I. 21-2). The Board will further address this issue in Docket B.

The Agency filed with the Board a United States Environmental Protection Agency (U.S.EPA) response to the Agency's proposal. In a letter to the Agency dated August 12, 1986, the U.S.EPA states, "Our review of the prepared amendments indicated that overall, the changes should not result in any conflicts with applicable Federal regulations." (P.C. #9).

Economic Impact

At hearing, the Agency stated that there were 15 communities presently utilizing lagoon systems which would immediately benefit from the proposed rule change. (RI.16; RII.11; Ag. Exh. #8). After the hearing, the Agency submitted data to the Board which indicates that 21 communities would be "eligible to apply to a lagoon exemption immediately upon the adoption of the proposal." The Agency indicated that two of these communities are currently using mechanical treatment systems. (P.C. #2, Attachment 1). By including these two communities on such a list, the Agency implies that the mechanical treatment systems of these two communities are currently at the end of their useful lives. Other data presented by the Agency indicates that approximately 144 other communities, currently using mechanical treatment systems, would qualify for an exemption under the Agency proposal once the systems reach the end of their useful life. The Agency notes that some of these facilities may be consolidated with other plants or expanded so as to remove them from exemption eligibility. (P.C. #2, Attachment 2). The following economic data comparing the cost of compliance with and without the proposal were also supplied by the Agency as well as by testimony at the hearing.

POTW Discharger	Compliance Cost Without the Proposed Exemption			Compliance Cost With the Proposed Exemption		
	Capital	OM&R	Monthly House Hold Cost	Capital	OM&R	Monthly House Hold Cost
Aledo	\$2,509,000	108,000	----	1,910,000	50,000	-----
Christopher	2,800,000	----	16.78	800,000	----	9.55
	(Would receive \$1.4 million grant from EPA)					
Coal City	3,206,000	166,700	68.95*	757,000	62,400	31.23*
Gillespie	2,991,000	----	----	826,000	110,000	---
Johnston City	2,500,000	----	----	800,000	----	----
Kincaid	3,000,000	----	----	703,000	45,000	----
McLeans- boro **	1,500,000	41,500	16.50	1,000,000	25,800	11.00
New Baden	1,500,000	141,000	----	260,000	71,000	----
Staunton	3,800,000	192,000	----	2,000,000	79,000	----
Virден **	5,012,000	----	----	2,840,000	----	----

* : (for 20 years)

** : Denotes current mechanical plant.

--- : Denotes Data Not Presented.

(P.C. #2 Attachment 1; RI. 29; RII. 31
RII. 38; RII. 43)

It is clear that the communities listed above would save a considerable amount of money if the Agency's proposal is adopted. If such costs are representative, the proposal, if adopted, would eventually result in a savings to over one hundred communities. As previously stated, DENR has concluded that the net economic impact of the proposed amendment would be favorable.

Environmental Impact

It is the Agency's position that mechanical systems, such as activated sludge systems and trickling filters, generally show "more identifiable impact and detriment than properly designed and operated lagoon systems." According to the Agency, this poor performance level of mechanical systems is primarily due to plant

upsets, solids washout, and difficulties in achieving stable and consistent ammonia reduction. (RII. 10). Consequently, the Agency concludes that "lagoons may be more protective of receiving stream water quality than mechanical facilities." In support of this conclusion, the Agency refers the Board to Stream Surveys it has provided. (P.C. #4).

Attached to the stream surveys are NPDES monitoring data reports for the years 1983 through 1985. These reports present data on the quality of the POTW effluents over three years. On the other hand, the stream surveys of the same POTW's did not always sample the effluent for BOD₅ and suspended solids. Even when the effluents were sampled, the results merely represent the quality of the effluent at one point in time. Consequently, the data shown below is taken from the NPDES monitoring reports. The figures presented are averages of the yearly average for the years 1983, 1984 and 1985.

<u>Discharger</u>	<u>Flow (MGD)</u>	<u>BOD₅ (mg/l)</u>	<u>Suspended Solids (mg/l)</u>
<u>Mechanical Systems</u>			
Walnut	0.20	15.0	18.0
Lake County, Sylvan-Diamond Lake	0.26	18.7	14.3
Red Bud	0.51	5.7	9.0
Bushnell	0.57	11.3	7.0
<u>Lagoon Systems</u>			
Greenfield	0.21	8.7	13.0
Mount Sterling	0.47	11.3	21.7
Breese	0.53	2.3	9.7

(P.C. #2)

A flow rate range from .25 to .50 million gallons per day (MGD) roughly represents a population equivalents range of 2500 to 5000. (P.C. #2). The Board notes that at hearing the Breese facility's near-compliance performance level was classified as an exceptional case among lagoon systems. (RII. 45).

The record does not indicate how or why the seven plants and the associated stream surveys were selected from the universe of available facilities. The Board does not know if these are representative of the facilities and streams that may fall under the proposed rule. The record would also have benefited from a more complete discussion of the various design configurations

that lagoon and mechanical plants may use and the capabilities and costs of each. The information provided does not conclusively support the Agency's contention that lagoons generally have less adverse impact on receiving streams or that lagoons cannot produce effluent of a better quality than 30/37 on a consistent basis.

Agency data show that the performance levels vary considerably between POTW's of the same system type and size, as well as across system types. It is also apparent that with regard to these facilities neither system type consistently outperforms the other.

The proposed rule, as well as the current regulation, provides that no exemption may be granted to a facility if the discharge from that facility, alone or in combination with other discharges will cause a violation of the applicable dissolved oxygen water quality standard. DENR points out that the environmental impact of a lagoon exemption will vary from site to site. (DENR Exh. #1, p.3). DENR asserts that the Agency's modeling techniques do not adequately take into account such factors as sediment oxygen demand and algal respiration. Consequently, DENR concludes that the Agency will always overestimate the existing dissolved oxygen content of a stream. Such a situation would lead to an inaccurate evaluation of whether water quality standards will be violated by a POTW exemption, according to DENR. DENR requests that the regulation include methods of calculation to ensure that dissolved oxygen standards are not violated by POTW exemptions. (DENR Exh. #1, p. 11).

The foundation for the proposal is the Agency's view that POTW's treating a load less than 5000 p.e. can neither afford to utilize nor properly operate mechanical systems to meet the 10/12 standard. Therefore, the Agency concludes that these POTW's should be allowed to utilize lagoon exemptions. The Agency presumes that the only viable option for these POTW's is a lagoon system and less stringent effluent limitations. DENR submitted a report which concluded that land treatment systems could provide an alternative for wastewater treatment. The report states that any point discharge from a land treatment system would be well within the 10/12 standard. In many instances, a land treatment system would have no point discharge. (DENR Exh. #2, p. 1-2, 3-2, 3-20). The report makes a strong case for land treatment systems. Such systems would store effluent in lagoons for later application to land. It is also possible to develop a hybrid system which would discharge to streams during high flow and irrigate land during the growing season. The effluent can be spread by a number of methods including standard agricultural irrigation systems. The table below given approximate lagoon size and the land required for slow rate application. The information is derived from DENR Exh. #2, pp. 3-27 and 4-6.

<u>Wastewater Flow Rate (MGD)</u>	<u>Storage Lagoon</u>	<u>Land for Application</u>
0.1	2.18 acres	38.4 acres
0.2	4.36 "	76.8 "
0.3	6.54 "	115 "
0.4	8.70 "	154 "
0.5	10.9 "	192 "

The Agency responded to this report in a cursory fashion, characterizing land treatment as a technology that has consistently failed to be adopted by consulting engineers and their clients. The DENR report raises issues which the Board would like see expanded upon. Specifically, what economically reasonable alternatives are available for POTW's to treat wastewater and what standard could they meet. This topic will be discussed further under Docket B.

Summary

It is clear that the net economic effect of expanding the lagoon exemption would be positive. Many communities would save considerable amounts of money by being allowed to utilize lagoons to meet a 30/37 rather than a 10/12 standard. However, the Board is disappointed by the quantity and quality of data presented by the Agency concerning the costs and capabilities of various treatment alternatives and the environmental impact of the proposal. According to the Agency's own figures, over 150 communities could eventually take advantage of this proposed expansion of the lagoon exemption. The Agency has given the Board effluent information on only seven POTW's. If data presented at hearing by Coal City is counted, the Board has before it effluent information from eight POTW's.

Although the Agency proposal is written so that no exemption will be granted which would result in a violation of dissolved oxygen standard, the Agency proposal could still result in a decline in the quality of the receiving streams. Given the record, it is impossible for the Board to assess the environmental impact that will result if up to 150 communities switch to lagoon systems.

The Clean Water Act requires all POTW's to be in compliance with effluent limitations by July 1, 1988. The Board recognizes the urgent need for a number of POTW's to ascertain whether or not they will qualify for an exemption so that they may alter their operations accordingly in order to achieve compliance by the deadline. It is apparent that many communities presently need relief so that their compliance will be assured by July 1, 1988. However, the record is insufficient to support the full extent of the exemption proposal requested by the Agency. As a result, the Board will allow lagoon exemptions for those POTW's treating a load of less than 5000 p.e., which are presently utilizing lagoon systems or which have a system that has reached the end of its useful life by January 1, 1987. Such action will

essentially preserve the status quo regarding impact on streams while allowing communities to take advantage of the coming construction season.

Due to the unresolved questions in this record, it is necessary for the Board to consider under a separate docket the proposal for expanding the lagoon exemption to those non-lagoon facilities which have not reached the end of their useful lives by January 1, 1987. This docket allows the Agency and the public, including DENR, to provide information on a number of topics including whether well designed and run lagoon systems can produce an effluent of better than 30/37 quality; the costs of various treatment alternatives; the practical feasibility of using land treatment in Illinois alone or in combination with other methods; and the impact of various systems on streams.

In P.C. #6, the Agency questioned the propriety of DENR filing its exhibits #1 and #2 after issuing a negative declaration. The concern would appear to be that the exhibits could lead to a modified proposal with altered economic impact. In this matter, the Board has already opened Docket B based on a desire for an expanded record. The stated concern will, therefore, not impact Docket A. The type of information contained in the two exhibits is most helpful to the Board in reaching informal decisions on complex rules. The Board encourages DENR and other knowledgeable persons or entities to participate in the regulatory process. The Board specifically notes that DENR's ability to participate is by no means limited to its EcIS function. That function is separate from its right to provide such technical input to the process as it deems appropriate. DENR is diverse and includes the Scientific Surveys as well as the remnants of the Institute for Environmental Quality which was originally mandated to among other things "give expert guidance to the Agency and to the Board in the formulation of regulations". Ill Rev. Stat. 1975, ch. 111 ¹/₂, par. 1006. Technical input to a proceeding, such as that contained in the two exhibits, is appropriately introduced at hearing and may be considered in the EcIS process. Such information is generally presented by DENR personnel while the EcIS is often prepared by outside consultants under contract. The Board recognizes the potential problems associated with the timing of the filing in question and the fact that the exhibits were not discussed at hearing. However, the Agency and other participants did have 30 days to comment on the two exhibits. The coming hearings in Docket B will provide the opportunity to correct any problems that would otherwise exist because of the lateness of the filings.

As stated earlier, DENR requests that the Board include in the regulation modeling methods to ensure that dissolved oxygen water quality standards are not violated by the lagoon exemptions. DENR claims that the modeling methods used by the Agency overestimate the dissolved oxygen content of the streams. Such modeling techniques are certainly within the field

of the Agency's expertise. The Board will defer to the Agency's technical expertise in choosing the proper modeling method in Docket A. The issue can be explored on the record by all participants in Docket B.

ORDER

In response to the objection of the Joint Committee on Administrative Rules, the Board hereby modifies its rule to add subsection (f) and directs the Clerk to cause the publication of a notice of this response in the Illinois Register.

Section 41 of the Environmental Protection Act, Ill. Rev. Stat. 1985 ch. 111 1/2 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.

The Board hereby directs the Clerk to cause the filing of the following final, adopted rule with the Secretary of State.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE C: WATER POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD

PART 304
EFFLUENT STANDARDS
SUBPART A: GENERAL EFFLUENT STANDARDS

Section 304.120 Deoxygenating Wastes

Except as provided in Section 306.103, all effluents containing deoxygenating wastes shall meet the following standards:

- a) No effluent shall exceed 30 mg/l of five day biochemical oxygen demand (BOD₅) (STORET number 00310) or 30 mg/l of suspended solids (STORET number 00530), except that treatment works employing three stage lagoon treatment systems which are properly designed, maintained and operated, and whose effluent has a dilution ratio no less than five to one or who qualify for exceptions under paragraph (c) shall not exceed 37 mg/l of suspended solids.
- b) No effluent from any source whose untreated waste load is 10,000 population equivalents or more, or from any source discharging into the Chicago River System or into the Calumet River System, shall exceed 20 mg/l of BOD₅ or 25 mg/l of suspended solids.
- c) No effluent whose dilution ratio is less than five to one shall exceed 10 mg/l of BOD₅ or 12 mg/l of suspended solids, except that sources employing third-stage treatment lagoons shall be exempt from this paragraph (c) provided all of the following conditions are met:

- 1) The untreated waste load is less than 2500 population equivalents and
- 1) The waste source qualifies under one of the following categories:
- A) Any wastewater treatment works with an untreated waste load less than 2500 population equivalents, which is sufficiently isolated that combining with other sources to aggregate 2500 population equivalents or more is not practicable.
- B) Any publicly owned treatment works in existence on January 1, 1986 whose untreated waste load is 5000 population equivalents or less and sufficiently isolated that combining to aggregate 5000 population equivalents or more is not practicable.
- C) Any publicly owned treatment works with an untreated waste load of 5000 population equivalents or less, which has reached the end of its useful life by January 1, 1987, and is sufficiently isolated that combining to aggregate 5000 population equivalents or more is not practicable.
- 2) Is sufficiently isolated that combining with other sources to aggregate 2500 population equivalents or more is not practicable; and
- 3) 2) The lagoons are properly constructed, maintained and operated; and
- 4) 3) The deoxygenating constituents of the effluent do not, alone or in combination with other sources, cause a violation of the applicable dissolved oxygen water quality standard.
- d) No effluent discharged to the Lake Michigan basin shall exceed 4 mg/l of BOD₅ or 5 mg/l of suspended solids.
- e) Compliance with the numerical standards in this Section shall be determined on the basis of the type and frequency of sampling prescribed by the NPDES permit for the discharge at the time of monitoring.
- f) For the purposes of this Section, useful life is the period of time during which it is cost effective to operate and maintain a particular wastewater treatment works under consideration. At a minimum, the following

factors relating to a wastewater treatment works shall be considered in a determination of its useful life:

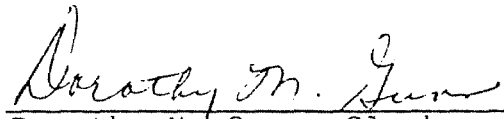
- 1) Structural and operational condition of components;
- 2) Past operations and maintenance record;
- 3) Cost for continued use; and
- 4) Description and costs for treatment alternatives.

(Source: Amended at 11 Ill. Reg. _____,
effective _____)

IT IS SO ORDERED.

J. Dumelle concurred,

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Order was adopted on the 6th day of August, 1987, by a vote of 6-0.


Dorothy M. Gunn, Clerk
Illinois Pollution Control Board