

ILLINOIS POLLUTION CONTROL BOARD
January 23, 1986

IN THE MATTER OF:)
)
SITE-SPECIFIC RULEMAKING) R85-15
FOR THE SANITARY DISTRICT)
OF DECATUR, ILLINOIS)

PROPOSED RULE. FIRST NOTICE.

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

PROCEDURAL HISTORY

On May 31, 1985, the Sanitary District of Decatur ("District") filed a petition for site-specific rulemaking with the Board. Specifically, the District requests that it be granted exception from 35 Ill. Adm. Code 304.120(c), which presently limits discharges from the District's sewage treatment works to 10 mg/l of five-day biochemical oxygen demand (BOD₅) (STORET number 00310) and 12 mg/l of suspended solids (STORET number 00530). In place of these limits, the District proposes that its discharge be subject to BOD₅ not to exceed 20 mg/l and suspended solids not to exceed 25 mg/l.

Hearing was held in this matter September 9, 1985, at the Decatur Public Library. At hearing the Illinois Environmental Protection Agency ("Agency") indicated its support for the District's request, and presented testimony to that effect. A statement favoring the District's request was also made by Richard J. Lutovsky, President of the Metro Decatur Chamber of Commerce. No objections to the District's request have been received by the Board, either at hearing or through filings.

The Illinois Department of Energy and Natural Resources made a "Negative Declaration" of economic impact in this matter on December 5, 1985, noting the declaration is appropriate based on the statutory criteria in Ill. Rev. Stat., Ch. 92^{1/2}, par. 7404(d)(2). The Economic Technical Advisory Committee concurred in this determination on December 6, 1985.

BACKGROUND

The Sanitary District of Decatur is located in Decatur in Macon County, Illinois, at the address of 501 Dipper Lane, Decatur, Illinois 62522. The wastewater treatment facility is located at mile point 126.4 on the Sangamon River on the southwest side of the City of Decatur, Illinois. The District provides sewage treatment service to approximately 136,700 residents in the City of Decatur and adjoining areas, and to

industrial customers which contribute 49.5% of the total flow and 59.3% of the total organic loading. The City of Decatur is served primarily by a combined sewer system; however, more recent additions and expansions are serviced by separate sanitary and storm sewer systems.

The District is presently engaged in a large-scale facilities improvement program. Approximately \$25 million of construction was in progress at the time of filing of the petition. The entire program, absent the requested relief, is estimated to cost approximately \$147 million and is scheduled for completion by December 1990. Planned facilities include: bar screens, grit chambers, circular primary clarifiers, secondary fine-bubble aeration basins, circular secondary clarifiers, nitrification fine-bubble aeration basins, circular nitrification clarifiers, effluent pumps, chlorination facilities, sludge return facilities, digested sludge storage, sludge land-application equipment, and tertiary filters. The District also plans to provide treatment of the first flush pollutants at five combined sewer overflow locations (Petition, p. 10).

The United States Environmental Protection Agency ("USEPA") has reviewed the construction program and has approved and committed to participating in funding all major elements of the program except the tertiary filters. The USEPA position is that tertiary filtration is not necessary to achieve Illinois' water quality standards, and hence it has deferred funding on this matter (R. at 135). Accordingly, if the filters were to be emplaced under present circumstances, the cost would have to be borne in full by the State and the District, in approximately equal shares (R. at 136).

Granting of the requested relief would in fact allow the District to exclude the proposed tertiary filters from its construction program, as well as allow alternate design of the overall effluent pumping system. In combination it is asserted that these would entail a construction cost reduction of approximately \$9.2 million (Petition at 4; R. at 93, 100, 122), \$4.7 million of which would be savings directly to the residents of the District and the rest savings to the State (R. at 122). The District would also realize an annual operations savings of approximately \$87,000 (Petition p. 4; R. at 93). The saving of these sums constitutes Petitioner's principal purpose for requesting the desired relief (R. at 93).

ENVIRONMENTAL IMPACT

Under normal conditions, effluent discharge from the District's treatment facilities constitutes the primary flow in the Sangamon River at and below the District's outfall. This condition exists in part due to the location of the outfall with respect to Lake Decatur, which is located approximately four miles upstream from the outfall. During prolonged dry weather water is retained in the lake to maintain pool elevation, with a

corresponding loss to downstream flow. Thus, the 30-day 10-year low-flow downstream from the Lake Decatur dam is 0 cubic feet per second (cfs) during all months except April, May, and June, when it is 75, 95, and 63 cfs, respectively (Ex. 5, Table 1).

Interest in quality water in the Sangamon River below the District's outfall extends beyond the mandate of protecting the integrity of instream uses. The Sangamon River also offers the potential for withdrawal uses, including use as a raw source for domestic water. At present, the City of Springfield, which is located approximately 48 miles downstream, is considering the use of the Sangamon River as an emergency supplementary source of water (Petition, p. 8), and other similar withdrawal uses are possible.

The District asserts, and the Agency concurs, that granting of the requested relief will not prevent Petitioner from complying with present water quality standards in the Sangamon River.

In 1982 the Agency, along with the Illinois Department of Conservation and the United States Geological Survey, conducted an intensive field study and stream modeling of the Sangamon River in the reach between Decatur and Springfield. Results have been published by the Agency in a three volume report titled Water Quality Assessment of a Major Portion of Sangamon River Basin, dated March 31, 1983, and presented as Joint Agency and Petitioner's Exhibit 1. A part of this study addresses the impact of the District's outfall on instream dissolved oxygen (DO). Specifically considered are six scenarios of varying carbonaceous BOD₅ (CBOD₅) and ammonia nitrogen (NH₃-N) discharge concentrations and their impact on stream DO concentrations under low flow conditions. Three of the scenarios are not germane to the instant matter because they consider NH₃-N concentrations substantially in excess of that anticipated for the new District facility. The remaining scenarios consider three levels of CBOD₅ in accompaniment with an NH₃-N discharge of 1.5 mg/l. The latter is the intended design level of NH₃-N discharge under the proposed facilities improvement program. The three CBOD₅ concentrations are 10, 15, and 20 mg/l.

Modeling of instream DO concentrations at the three specific CBOD₅ concentrations was accomplished using Qual II, a computer-based model developed by Water Resources Engineers and available on the USEPA TYMNET system. Model calibration was accomplished using two sets of field data collected during intensive diel sampling periods in mid-August and mid-September of 1982. In addition, various other field studies conducted between June and November 1982 were relied upon to estimate time-of-travel and reaeration values. Sensitivity analysis, combined with model calibration, verification, and recalibration, suggested to the Agency that the model "could be used with a very high degree of confidence to predict DO profiles within the study area, downstream from the DSD discharge, for a wide range of flow conditions (40 to 400 cfs)" (Joint Exhibit 1, Vol. I, p. 3).

Field conditions at the time of the two calibration studies were significantly different. Several days prior to and during the August calibration period there was a sustained release of water of approximately 100 to 110 cfs over the Lake Decatur dam. Several days prior to and during the September sampling there was no release other than leakage at approximately 2.2 cfs. Thus, the September sampling approximates the worst case condition regarding the ability of the District's discharge to be assimilated by flows in the Sangamon River (R. at 22).

Model results indicate only small differences in instream DO concentrations at the three differing levels of CBOD₅. In particular, using the August 1982 calibration the maximum difference in DO concentrations between a 10 mg/l CBOD₅ discharge and a 20 mg/l CBOD₅ discharge is 0.2 mg/l, with most differences being 0.1 mg/l or less (Joint Exhibit 1, Vol. III, Figure 32); all absolute values are greater than or equal to 7.2 mg/l DO. Using the September 1982 calibration the maximum difference was 0.7 mg/l with no absolute values below the District's outfall less than 6.3 mg/l DO (Joint Exhibit 1, Vol. III, Figure 33). On this basis the District, with the concurrence of the Agency, has asserted that no violations of DO water quality standards* would be occasioned by limiting the District's effluent to 20 mg/l BOD₅ (R. at 40).

The USEPA has contracted an outside review of the Agency's modeling effort (Ex. 5, Attachment 1), which review is generally critical of the modeling. Notwithstanding this fact, the USEPA has drawn conclusions which support those of the Agency and the District. Specifically, the USEPA concludes that during the summer** an effluent discharge of 20.0 mg/l CBOD₅ and 1.5 mg/l NH₃-N is adequate to maintain instream DO criteria (Ex. 5, p.10). They further conclude that tertiary filtration, given the presence of nitrification, is not necessary to achieve a CBOD₅ of 20 mg/l (Ex. 5, p.10), and that therefore the "proposed tertiary filtration following nitrification is not supported by the DO water quality analyses as necessary to meet the DO and ammonia criteria and to result in significant DO improvement" (Ex. 5, p. 11).

It is noteworthy that the assertion of no violation of instream standards is based upon NH₃-N effluent concentrations not exceeding 1.5 mg/l; at higher NH₃-N discharges modeling indicates below-standard DO concentrations at both calibrations

*Dissolved Oxygen (STORET number 00300) shall not be less than 6.0 mg/l during at least 16 hours of any 24 hour period, nor less than 5.0 mg/l at any time (35 Ill. Adm. Code 302.206).

**The USEPA is silent on the matter of recommending an exact CBOD₅ effluent limitation for the winter, noting only that "this value should be based on the expected CBOD₅ removal capability facilities designed to achieve 20 mg/l CBOD₅ during warm weather (Ex. 5, p.10).

for CBOD₅ concentrations above 10 mg/l (Joint Exhibit 1, Vol. III, Figures 32 and 33). This is consistent with ammonia concentrations exerting a major control on instream DO. The Board also notes that USEPA's conclusion that tertiary filtration is not necessary for the District to meet water quality standards is predicated on the assumption that the District will achieve a design effluent limitation of 1.5 mg/l of NH₃-N (Ex. 5, p.7). For its part, the District asserts, and the Agency concurs, that it will meet the 1.5 mg/l NH₃-N discharge condition upon completion of its plant improvements (R. at 39; 54).

Of further note is that the District does not propose to operate at a full 20 mg/l BOD₅ discharge all of the time. Rather, under normal operating conditions the BOD₅ would be at some lesser value (R. at 109). This position is supported by the conclusion of the USEPA that nitrification plants (as the District's is proposed to be) in Illinois and other States consistently produce effluents with a CBOD₅ less than 10 mg/l, and typically within the range of 4-6 mg/l (Ex. 5, p.10).

In contrast to exposition of the environmental impact of the proposed change in BOD₅, there is little in the record which focuses on the environmental impact of the accompanying proposed increase in suspended solids discharge, other than as suspended solids contribute to oxygen demand. The record does support that increasing the BOD ceiling requires an attendant increase in the suspended solids ceiling, since it is the suspended solids which exert a significant fraction of the oxygen demand (R. at 111). But with respect to other impacts the Record only notes generalities regarding the effects of suspended solids and the conclusion that an increase in loading from the District would be small compared to the typical background loading (R. at 110, 129). The Board would welcome comments on this aspect of the proposal during the first notice comment period.

FIRST NOTICE RULE

Both the District and the Agency assert that there would be no violation of water quality standards as a consequence of promulgation of the requested site-specific regulation. The Board has no reason for disputing the likelihood of this assertion. However, the Board does note that the foundation upon which the assertion is based is that of modeling of a proposed condition, rather than monitoring of an actual condition. Models are, by their nature, subject to inherent uncertainties related to such matters as the degree to which the model faithfully portrays complex natural interactions and the degree to which simplifying assumptions are justified.

The inherent uncertainties of modeling are not sufficient grounds for the Board to reject the District's site-specific request; in the absence of an ability to monitor a future condition, the District has had no recourse other than to rely on the best available forecasting device (i.e., modeling). Nevertheless, the Board believes it necessary to note that failure of monitoring results to bear out the modeling studies,

and attendant failure to meet water quality standards, would require the District to take such steps as would be necessary to comply with the appropriate water quality standards (re: 35 Ill. Adm. Code 304.105). The District should further be aware that these steps might negate the District's ability to exercise the full relief proposed herein. Alternatively, the District might find it necessary to consider some alternate technology (e.g., instream aeration) which would allow water quality standards to be met.

The Board has considered whether the proposed rule should require that the District be responsible for monitoring instream DO concentrations. However, given that the Agency currently operates ambient water quality monitoring stations downstream from the District's outfall, and that DO monitoring is a standard operational procedure at these stations, the Board refrains at this time from imposing this seemingly duplicate effort on the District. The Board does request that the District and the Agency address the appropriateness of this course of action during the first notice comment period.

The Board does note the dependency of instream DO concentrations on the levels of Decatur's $\text{NH}_3\text{-N}$ discharge, and therefore proposes that the requested exception be applicable only when the modeled level of $\text{NH}_3\text{-N}$, namely 1.5 mg/l, is actually achieved. The record does not address whether this stricture is necessary only during warm weather, or whether it might be relaxed during cold weather. In the absence of further information, no distinction between appropriate warm and cold weather limitations can be made by the Board at this time. The Board will welcome comments on this matter during the first notice comment period.

The Board also notes that there is little distinction made in the record between CBOD_5 and BOD_5 . In particular, all the modeling is based on CBOD_5 , but the proposed regulation is presented in terms of BOD_5 without comment as to the significance involved in how these measures differ. Since it is generally considered that the CBOD_5 of a given effluent will be lower than the simultaneously measured BOD_5 (e.g., Ex. 5, Table 2), and the model results place the apparent necessary ceiling on CBOD_5 at 20 mg/l, a BOD_5 limit of 20 mg/l would appear to represent a conservative request. Alternatively, it may be that Decatur does not need relief to a full 20 mg/l of BOD_5 . For purposes of first notice the Board is retaining the District's proposal for a 20 mg/l limit expressed as BOD_5 . However, the Board requests that the District and the Agency address the appropriateness of this number during the first notice comment period.

An additional matter of concern to the Board is the permanency of the rule as offered by the Proponents. It is readily possible to imagine situations where a rule fully justifiable and rational at a given point in time may not continue to be so at a future date. In the instant matter, but by no means peculiar to it, would be a situation where future dischargers to the Sangamon River find that their increment of

discharge induces DO violations in the River, but that the violations would not exist in the absence of the exception granted to the District. The record does support the conclusion that the District's exception would utilize a portion of the River's capacity to assimilate oxygen-demanding wastes (R. at 50), a capacity which would then not be available to a future user. The Board questions whether this circumstance could lead to an inequitable and possibly illogical distribution of the spoils (and conversely the burdens) of environmental regulation.

Admittedly the problems associated with the permanency of a rule can be challenged by a counter-proponent who at a future date offers an alternative rule which partially or in total reverses an existing site-specific rule. However, this places the burden on a party other than the holder of the exception. The Board believes a more appropriate procedure is to require the holder of the exception to bear the burden of justification for continuing the exception.

Among other situations is the possibility that a future change in treatment technology, or, in the alternative, a change in technical or scientific understanding of the dynamics of water quality, would reflect negatively on the exception granted to the District. The Board cannot determine that any such changes will occur, but neither can it definitively say that they will not. Given that the history of environmental management has witnessed many such changes, the prudent posture may be to limit the operation of an exception to a specific time interval, after which a reconsideration may be undertaken.

Lastly, as a general position, the Board is concerned about the proliferation of site-specific rule proposals. While the Board fully intends to continue to review each on its individual merits, the Board is concerned that the trend will eventually lead to an edifice of patchwork site-specific rules, some of which will inevitably become obsolete and others which will lose their justification with time. This situation obligates future society with the need to regularly house clean already cumbersome regulations. Accordingly, the Board believes that there may be merit in considering "sunset" provisions as a feature in site-specific rulemakings. The Board would welcome comment on the inclusion of a sunset provision in site-specific rules not only from the participants in the instant matter, but from interested persons in general. The Board specifically requests comment regarding the effects of a sunset provision on federal funding programs and capital funding costs.

In view of the above, the Board proposes, as an addition to Proponent's requested language, that the rule be limited to ten years from the date of completion of the facility improvements. In as much as the District proposes to complete the second and final phase of its improvements as of December 1990 (Petition, p.12), the termination date is set in the first notice order at December 31, 2000. Inclusion of this provision in the final rule would not negate the District's ability to petition the Board, prior to expiration of the rule, for a repromulgation of a

similar or identical rule justifiable in the context of conditions and knowledge then existent. A ten year exception should provide a sufficiently long period for observation and study so that a well-informed decision on the continuing merits can then be made.

ORDER

The Board hereby adopts the following rule for First Notice and instructs the Clerk of the Board to file this rule with the Secretary of State:

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

PART 304

SITE-SPECIFIC RULES AND EXCEPTIONS
NOT OF GENERAL APPLICABILITY

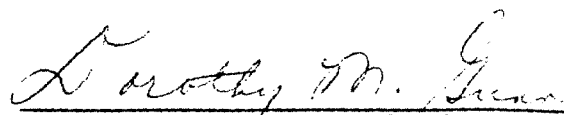
Section 304.212 Sanitary District of Decatur Discharges

- a) This Section applies only to effluent discharges from the Sanitary District of Decatur's Sewage Treatment Plant into the Sangamon River, Macon County, Illinois and only during such times as ammonia nitrogen as N (STORET 00610) discharge from said plant is less than or equal to 1.5 milligrams per liter.
- b) The provisions of Section 304.120(c) shall not apply to said discharges, provided that said discharges shall not exceed 20 mg/l of five day biochemical oxygen demand (BOD₅) (STORET number 00310) and 25 mg/l of total suspended solids (STORET number 00530).
- c) The provisions of this section shall terminate on December 31, 2000.

IT IS SO ORDERED.

Joan Anderson and J. Theodore Meyer concurred.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Proposed Rule/First Notice Opinion and Order was adopted on the 23rd day of January, 1986, by a vote of 7-0.


Dorothy M. Gunn, Clerk
Illinois Pollution Control Board