

ILLINOIS POLLUTION CONTROL BOARD  
February 15, 1979

IN THE MATTER OF: )  
 )  
AMENDMENTS TO THE WATER ) R76-1  
POLLUTION REGULATIONS )

PROPOSED OPINION OF THE BOARD (by Mr. Dumelle):

This proceeding was initiated by a Petition from the Agency filed with the Board on January 5, 1976. The Petition was published in Environmental Register #118 on January 27, 1976. Hearings were held on June 2, 1976 in Peoria and on September 9, 1976 in Chicago. A study entitled "An Economic Analysis of Phosphorus Control and Other Aspects of R76-1" (IEEQ Document No. 78/16) was received by the Board from the Illinois Institute for Environmental Quality on June 30, 1978. Hearings were held on the study on September 11, 1978 in Kankakee and September 15, 1978 in Chicago.

This Proposed Opinion supports a Proposed Order adopted by the Board on January 4, 1979. Each proposed revision to Chapter 3: Water Pollution will be discussed in the order in which it appears in the Proposed Order.

RULE 203(c)

The Agency proposed that this rule be deleted. Rule 402 provides that whenever a body of water violates water quality standards, all dischargers to that body of water must reduce the strength of their effluent to a level which will not contribute to any further violation. Since 27 out of 28 lakes studied in Illinois are eutrophic (R.16) as well as 273 surveyed by the Agency and the Department of Conservation (R.92), all point sources which discharge to these lakes or to any tributary to them must comply with the water quality standard of 0.05 mg/l in order to avoid further aggravation of the water quality violations in these lakes. As an alternative to this situation, the Agency proposes that all such point source discharges whose untreated waste load is 1500 or more population equivalents meet an effluent standard of 1.0 mg/l. The Agency's reasoning is that an effluent standard of 0.05 mg/l is not feasible for point source discharges and that these dischargers need relief until a coordinated strategy covering point and nonpoint sources is developed (R.7).

In 1972 the Board concluded that ". . . phosphorus above this level (0.05 mg/l) in relatively still water can give rise to obnoxious algae blooms". (3 PCB 758) The Board received evidence in this record that the present water quality standard should be retained (R.133, 158; June 23, 1976 comment from the Illinois State Water Survey) as a benchmark against eutrophication.

The Board concludes that the standard in Rule 203(c) should be retained as a goal with the proviso that point source dischargers which comply with Rule 407 (discussed infra) should not be required to meet a 0.05 mg/l effluent standard.

The 20 acre minimum size for lakes or reservoirs is the size used by USEPA, and it represents the extent of known data on Illinois lakes (R.18). Low level pools are excluded to avoid coverage of tributary pools formed for purposes of navigation or low level water control. (R.19) Bodies of water which are part of an operation including the application of sludge on land are excluded because of concerns raised by the Metropolitan Sanitary District of Greater Chicago (MSD). A witness for MSD stated that this exclusion was necessary to exempt the reservoirs and the discharges to them which are encompassed by the MSD's project in Fulton County. (R.110-130) The Board agrees that these reservoirs have no public recreational value and no purpose would be served by limiting their phosphorus levels.

RULE 203(f)

The changes in STORET numbers in Rule 203(f) were described by the Agency as clerical in nature. (R.52) Each change is described in detail in Exhibit 4. The changes provide for the use of different analytical techniques in water quality analyses. (R.52-56, 98)

RULE 203(i)

The thermal standards which apply to the lower Des Plaines River from the I-55 bridge to its confluence with the Kankakee River are deleted since these standards expired on July 1, 1978.

RULE 204

The STORET numbers in Rule 204 are being changed for the same reasons cited in the discussion of Rule 203(f). All of the other changes and deletions are being made to conform Rule 204 with the recently proposed changes to Rule 304B4 of Chapter 6: Public Water Supplies in R77-13. Since Rule 304B4 of Chapter 6 sets the standards for chemical and physical quality of finished drinking water and Rule 204 is aimed at protecting water designated for public and food processing consumption, the standards should be similar.

RULE 206

The STORET number for total dissolved solids in Lake Michigan is being changed for the same reasons cited in the discussion of Rule 203(f).

#### RULE 302

The changes to Rule 302 simply clarify the purpose of this rule. In Modine Manufacturing Company v. PCB, 40 Ill.App.3d 498, 351 N.E.2d 875 (Second District 1976) and Olin Corporation v. EPA & PCB, 54 Ill.App.3d 480, 370 N.E.2d 3 (Fifth District 1977), two Appellate Courts ruled that the only way streams could be reclassified to be included in Rule 302 was through the Board's rulemaking procedure. Rule 302 is being changed to clarify that fact and to state that the standards of Rule 205 should apply (as they always have) to these waters.

#### RULE 404

The maximum standard for suspended solids is being lowered from 37 mg/l to 30 mg/l to conform with the Federal standard for secondary treatment. (R.61) Since all point source discharges in Illinois must comply with the Federal minimum, the old standard was no longer in effect anyway. The Agency contended that the revision should not cause any great difficulty. (R.61,67,96) The STORET number for suspended solids has been added to provide a standard technique for analysis of this parameter.

The interim standards in Rules 404(a),(b),(c), and renumbered (g) have been deleted because all of their deadlines have passed.

The demonstration requirements in Rules 404(c)(i) and 404(e)(ii)(A) are being changed to clarify their intent. These demonstrations are designed to measure downstream effects on dissolved oxygen only. (R.61) If any of these discharges cause downstream violations of any other water quality standards, the mandate of Rule 402 still applies.

The changes to renumbered Rule 404(f) are being made to provide the Agency with the flexibility it needs to administer the NPDES permit program as provided in Rule 910(f).

#### RULE 407

The effluent standard in Rule 407(b) for phosphorous discharges in the Fox River basin is being eliminated for all dischargers below the Chain of Lakes. The Board received a comment from the Aurora Sanitary District which indicated that as long as the Chain of Lakes was causing phosphorous problems in the Fox River, downstream control wasn't going to help anything. The Agency agreed that it might be wise to hold up operation of downstream phosphorus removal facilities until a Chain of Lakes control strategy is implemented. (R.94) The Agency did not feel it would be appropriate to drop the requirement that these facilities be installed since this might jeopardize grant funds. (R.93) The Board is not convinced that phosphorus removal should

ever be required when there is no downstream lake or reservoir. Since the phosphorus problem on the Fox River can be traced to the Chain of Lakes, the strategy for control in the Fox River basin should be limited to those discharges which drain into those lakes.

A new Rule 407(c) provides for an effluent standard (1.0 mg/l) for large discharges which are tributary to lakes or reservoirs. The Board has adopted 1.0 mg/l since this represents the limit for consistent performance from a sewage treatment plant (R.11) without advanced wastewater treatment (R.193-197; Ex. 6,13,24; September 9, 1976 and September 8, 1978 comments from Granite City Steel and In Re: Phosphorus Water Standards, R70-6; 1 PCB 515,521-523; April 28, 1971). A cutoff figure of 5,000 or more population equivalents is proposed for required treatment for phosphorus with new sources complying immediately and existing sources complying by December 31, 1980. The 5,000 P.E. figure was chosen because this represents the point at which economics of scale set in and the cost of phosphorus removal by conventional means (alum or ferric chloride addition) levels off (Ex. 18, pp. 21,24).

A new Rule 407(d) provides that discharges with a range between 1500 and 5000 population equivalents should not have to treat for phosphorus unless a downstream lake or reservoir still violates the water quality standard in Rule 203(c) (0.05 mg/l) after December 31, 1983. These smaller dischargers should not have to face the higher treatment costs per gallon of flow unless the Agency's nonpoint source control strategy under Section 208 of the Clean Water Act has failed to result in compliance in the next five years. Point source dischargers which employ third - stage treatment lagoons shall remain exempt from meeting any effluent standard for phosphorus because the Board has not been shown, nor is the Board aware of, any feasible way these dischargers can provide for phosphorus removal.

The definitions in the new Rule 407(e) are the same as those cited in revised Rule 203(c) and are supported by the same evidence.

The compliance dates for existing sources in the new Rules 407(f)(ii) and (g) both provide for a two year grace period which the Board concludes is reasonable. If either of these dates creates arbitrary or unreasonable hardship, the variance provisions in Title IX of the Act and Part IV of the Procedural Rules provide for appropriate relief. The provision for immediate compliance by new sources is justified since these dischargers can design their facilities with this new rule in mind.

#### RULE 408

The change in the STORET number for selenium in Rule 408(a) is supported by the same reasons cited in the discussion of Rule 203(f). Rule 408(e) has been deleted since both of its interim compliance dates have passed.

## ECONOMIC IMPACT

Twenty-seven sewage treatment plants that would be affected by the proposed regulation were identified in the Study. (Ex.18, p.14) This identification was based on the proposed Rule 407(c) which had a 1500 population equivalent (P.E.) cutoff. With a 5000 PE cutoff it is apparent that many of these twenty-seven would not be covered by Rule 407(c); however, some could fall under the coverage of Rule 407(d) and be required to control their phosphorus effluents at a later date. This introduces additional uncertainty into the quantification of control costs which are attributable to the proposed regulation. Thus the total yearly costs which were estimated (Ex.18, p.20) should be used as an estimate of possible, but not probable, costs. Estimated costs to individual sewage treatment plants which are still covered remain valid.

The Study estimated control costs of phosphorus removal by mineral addition and also by land application. The former was found to be cheaper. (R.213; Ex.18, p.25) A range of total annual costs of meeting a 1 mg/l effluent standard by mineral addition for the 27 sewage treatment plants of one-half to one million dollars was estimated. (R.215-216) This was compared to the Ely, MN experience in treating to a 0.05 mg/l effluent level. It was estimated that for the 27 sewage treatment plants to meet an effluent limitation of 0.05 mg/l would cost three to six times what it would cost to meet a 1.0 mg/l effluent standard. (Ex.18, p.32)

The Study investigated the effect of phosphorus point source control on the eutrophic condition of Illinois lakes. The analysis classified lakes as eutrophic or oligotrophic using the following predictory variables: phosphorus loading, mean depth, and residence time of the water in the lake. (Ex.18, p.37) Then, a change in phosphorus loadings (consistent with the proposed regulation) was postulated; the change in probability of non-eutrophic status was calculated. The authors of the Study concluded that in most cases "although some long run type of improvement might be predicted, the lakes would still probably not become noneutrophic because of this standard." (R.220; Ex.18, pp.46-48) However, the authors also point out that while the postulated reduction in phosphorus loading may not in and of itself be sufficient to change the trophic status, the lake has been brought that much closer to the necessary conditions for a change in trophic status. (Ex.18, p.38)

An attempt was made to quantify the recreational value of nine lakes in Illinois. An estimated demand curve for lake recreation was based on the travel cost method. (Ex.18, p.49) The travel cost method, as the name implies, attributes differences in attendance at recreational areas to the differences in the cost of traveling to these areas. This travel cost is treated as the price of recreation and hence a demand

curve can be formulated. From the demand curve comes an estimate of the total value of recreation, including consumer surplus. (R.225; Ex.18, pp.49-53) The Study made clear that this method can understate benefits. (Ex.18, pp.55-56) This point was also made in Exhibit 21.

Net benefits of the nine lakes were estimated for the present (Ex.18, p.61, table 2), for the year 1990 (Ex.18, p.63, table 3), and for the year 2000 (Ex.18, p.63, table 4). The fundamental limitation to this analysis is that the Study does not relate changes in water quality to changes in recreational value. (R.225-226; Ex.18, p.70) However, the quantification of net benefits does demonstrate that a relatively small percentage increase in recreation value would cause an increase in quantified benefits in excess of the anticipated control costs. (R.226; Ex.18, p.72)

An analysis of secondary benefits to the Illinois economy due to the proposed regulation was performed; this analysis, however, is also limited by the inability to relate changes in water quality to changes in recreational value. (R.227) It was estimated that a 1% increase in lake visitation would increase Illinois production by \$1.47 million in 1990 and \$1.64 million in 2000; the number of jobs associated with such a 1% increase are 71 by 1990 and 80 in 2000.

The change from 37 mg/l suspended solids to 30 mg/l suspended solids in Rule 404 is not anticipated to have any economic impact since no additional control costs will be incurred. (Ex.18, p.82) The proposed deletion of Rule 302(k) is merely a clarification of the existing Rule. Changes to STORET numbers may change some analytical procedures, but the economic impact is not anticipated to be significant. (Ex.18, p.83)

Based on the above analysis, the Board can conclude that adoption of the Agency's proposal or the Board's, which is less costly, should have no significant adverse economic impact on the people of the State of Illinois.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board hereby certify the above Proposed Opinion was adopted on the 15<sup>th</sup> day of February, 1979 by a vote of 3-0.

Christan L. Moffett/ss  
Christan L. Moffett, Clerk  
Illinois Pollution Control Board