

ILLINOIS POLLUTION CONTROL BOARD  
June 7, 1990

IN THE MATTER OF: )  
 )  
PETITION OF THE CITY OF PANA FOR SITE ) R84-44  
SPECIFIC RELIEF FROM PHOSPHORUS ) (Rulemaking)  
REGULATIONS )  
 )

PROPOSED RULE. FIRST NOTICE.

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

This matter comes before the Board on an amended petition for site specific regulatory relief filed by the City of Pana ("Pana") on February 1, 1985.

Pana's original petition, filed December 7, 1984 requested the Board to adopt a site-specific rule to provide Pana an "exclusion from the phosphorus discharge limitation as set forth in Section 203(c), 402 and 407(c)<sup>1</sup> in Chapter 31 of the Illinois Pollution Control Board Rules and Regulations." As shown through testing, Pana's discharge does not meet the applicable effluent limitation of 1.0 mg/l of phosphorus as P as established in Section 304.123. Section 304.105 prohibits the discharge of effluents which would "cause a violation of any applicable water quality standard." 35 Ill. Adm. Code 304.105.

PROCEDURAL HISTORY

On April 9, 1985, a public hearing was held in Pana, Illinois which was attended by members of the public and by representatives of the Illinois Environmental Protection Agency ("Agency"), the Department of Energy and Natural Resources ("DENR"), Pana, and Pana's consultant, the Architectural and Engineering Service Corporation. After witnesses for Pana had testified, the witness for the Agency stated that the Agency was committed to reevaluating the phosphorus effluent limitations contained in Board regulations. In that regard the Agency recommended that any ruling or decision in this case be delayed

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<sup>1</sup> (Presently the effective phosphorus standards are set forth in 35 Ill. Adm. Code 304.105 and 304.123.)

References to the hearing of April 9, 1985 are referred to as 1TR. \_\_\_\_; those of March 25, 1988 as 2TR. \_\_\_\_ . The exhibits from those hearings bear the designation 1Exh. \_\_\_\_ and 2Exh. \_\_\_\_; respectively.

at least until it had an opportunity to address these issues in more detail and provide more information for the record, either in this proceeding or a separate proceeding (LTR 100-104).

The witness further testified that the Agency's position was that this proceeding essentially be put on hold until the Agency had a firm recommendation. In the alternative, the Agency recommended dismissal until such time as the regulation could be assessed on a state-wide basis (Id.).

On August 1, 1985, Pana filed a Motion to Stay Proceedings requesting the Board not to make a decision until the Agency "determines what its regulations will be regarding phosphorus discharge limitations". On August 11, 1985, the Agency filed its response wherein it did not object to Pana's motion.

On September 20, 1985, the Board denied Pana's motion stating: 1) alternate relief exists in the form of a variance; 2) the Agency had made no firm commitment to filing a proposal for regulatory change and 3) even if a proposal were filed, such proceeding could take one to two years for completion.

On October 18, 1985, Pana advised the Board of its intention to dismiss this petition for site specific relief and file a variance proceeding. However, on December 2, 1985, Pana filed a motion to have the Board proceed.

Subsequently, in a letter dated December 31, 1985, DENR informed the Board that it had evaluated the record and decided to attempt an Economic Impact Study (EcIS) based on the model developed in the R83-23 Tuscola site-specific rulemaking. The letter stated:

An EcIS of a generic nature is currently being contracted for R83-23 Tuscola Site-Specific which will result in a broad evaluation model to examine waste water treatment alternatives and their corelative (sic) cost/benefits for small municipalities.

Pana has similar demographic characteristics and involves the same issues. Therefore, the Department will attempt an Economic Impact Study which encompasses R84-44 Pana Site Specific based on the model developed by the R83-23 EcIS.

A letter dated December 22, 1986 from the Agency to Pana, however, expressed the belief that DENR was awaiting the outcome of the Agency statewide review before rendering a decision on the economic aspects of Pana's proposal. This letter also stated that the Agency's review of the phosphorus standards had been completed in August and that the Agency was waiting for USEPA comments before finalizing the Agency position.

On January 20, 1987 DENR sent a letter to the Board stating that DENR had evaluated the record, had decided to do an EcIS, had approved the scope of work, and would mail requests for proposals to potential contractors in the near future.

On March 20, 1987 the Agency filed proposed amendments to 35 Ill. Adm. Code 304.123, (R87-6) the phosphorus rules of general state-wide applicability. On January 6, 1988, DENR filed an EcIS prepared by Blaser, Zeni & Co. On March 25, 1988 the Board conducted an EcIS hearing. The only member of the public present was also a member of the press. Representatives of DENR, Pana, the Agency, and Blaser, Zeni attended. The Agency pointed out to the participants in this matter that the phosphorus regulations were being revised in a separate rulemaking, R87-6. The Agency urged the Board to provide relief to the City of Pana, but suggested that it might be better to act on the Agency's phosphorus proposal first (2TR. 27). At the Agency's suggestion, this was the course chosen by the Board.

The new state-wide phosphorus regulations were adopted over a period of 3 years after five opportunities for public input, three merit hearings and two public hearings to consider the economic reasonableness and technical feasibility of the proposal. The Board proceeded to Final Notice of the Rule on April 12, 1990 and the rule was published in the Illinois Register, May 4, 1990 (14 Ill. Reg. 6777).

Because of the changed standard, the Hearing Officer alerted Pana to the newly adopted state-wide phosphorus rule. On April 27, 1990 the Hearing Officer advised Pana of the Board's intention to proceed to a decision in the matter and requested that Pana advise the Hearing Officer whether it wished to amend its pleadings to request an adjusted standard or, alternatively, desired a decision on its pending request for site-specific relief. On May 18, 1990, Pana advised the Board that it wished a decision on its pending request.

#### APPLICABLE LAW

The goals of water pollution control in the State of Illinois are set out in Title III of the Illinois Environmental Protection Act ("Act"; Ill. Rev. Stat. 1987, ch. 111 1/2). It is there prescribed that:

It is the purpose of this Title to restore, maintain and enhance the purity of the waters of this State in order protect health, welfare, property, and the quality of life, and to assure that no contaminants are discharged into the waters of the state, as defined herein, including, but not limited to, waters to any sewage works, or into any

well, or from any source within the State of Illinois, without being given the degree of treatment or control necessary to prevent pollution, or without being made subject to such conditions as are required to achieve and maintain compliance with State and federal law.

Id. at par.1011(b)

Section 13(a) of Title III further specifies that:

The Board, pursuant to procedures prescribed in Title VII of this Act, may adopt regulations to promote the purposes and provisions of this Title. Without limiting the generality of this authority, such regulations may among other things prescribe:

1. Water quality standards specifying among other things, the maximum short-term and long-term concentrations of various contaminants in the waters, the maximum permissible concentrations of dissolved oxygen and other desirable matter in the waters, and the temperature of such waters;
2. Effluent standards specifying the maximum amounts of concentrations, and the physical, chemical, thermal, biological and radioactive nature of contaminants that may be discharged into the waters of the State, as defined herein, including, but not limited to, waters to any sewage works, or into any well, or from any source within the State.

Id. at par. 1013(a)

Proposals for site-specific regulations are governed by the provisions of Title VII of the Act, specifically Section 27 (Ill. Rev. Stat. 1987 ch. 111-1/2, par. 1027). Subsection (a), in relevant part, states as follows:

- a. The Board may adopt substantive regulations as described in this Act. Any such regulations may make different provisions as required by circumstances for different contaminant sources and for different geographical areas...and may include regulations specific to individual persons or sites. In promulgating regulations under this Act, the Board shall take into account the

existing physical conditions, the character of the area involved...the nature of the...receiving body of water...and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution.

While Pana's petition specifically requests site-specific relief it must be noted that this request originated before legislative creation of the "adjusted standard" mechanism. That mechanism is governed by Section 28.1 of the Act. Ill. Rev. Stat. 1989 ch. 111 1/2, par. 1028.1.

The general effluent limitations standard for phosphorus as revised is set forth below:

#### SUBPART A: GENERAL EFFLUENT STANDARDS

Section 304.123 Phosphorus (STORET number 00665)

- a. No effluent discharge within the Lake Michigan Basin shall contain more than 1.0 mg/l of phosphorus as P.
- b. No effluent from any source which discharges to a lake or reservoir with a surface area of 8.1 hectares (20 acres) or more, or to any tributary of such a lake or reservoir whose untreated waste load is 2500 or more population equivalents, and which does not utilize a third-stage lagoon treatment system as specified in Section 304.120(a) and (c), shall exceed 1.0 mg/l of phosphorus as P; however, this subsection shall not apply where the lake or reservoir, including any side channel reservoir or other portion thereof, on an annual basis exhibits a mean hydraulic retention time of 0.05 years (18 days) or less.

#### DISCUSSION

Pana operates a wastewater treatment plant (WWTP). Pana contends that the expenditures it makes to reduce phosphorus levels in its effluent exceed the resulting benefits. It therefore, has petitioned the Board to relieve it from applicable phosphorus regulations or, alternatively, to raise the allowable effluent limitation from 1.0 mg/l to 2.8 mg/l of phosphorus as P. Pana also requests protection and relief from applicable water quality standards and "such other and further relief as the Board deems equitable and just". (Amended Pet., p.8).

Pana has the equipment required to meet the 1 mg/l phosphorus limit (2TR. 8). However, Pana contends that (a) the downstream benefits are not worth the expenditures; (b) the phosphorus loadings of Lake Carlyle are four times the critical eutrophic limit, (c) all point sources combined contribute only 3.0% of the phosphorus loadings of Lake Carlyle, and (d) Pana's compliance with the 1.0 mg/l standard would reduce Lake Carlyle loadings by only 0.94%. (Pet. pp. 2-4, 6, 7) At the public hearing of May 31, 1985 Pana altered this last contention to approximately 2% of loadings but no more than 5% (1TR. 23). Pana currently contributes 14.8% of the point source loading to Lake Carlyle; if relief were granted it would contribute 33% (2TR. 60,63).

The principal benefits of granting the petition would be a reduction in expenditures by the City for operating its phosphorus-removal program. Pana contends that the principal cost of granting the petition would be the effect on the receiving water including, but not limited to, Lake Carlyle. Pana identified the affected water bodies as Coal Creek, Opossum Creek, Beck Creek, the Kaskaskia River and the Carlyle Reservoir (2TR. 8).

#### ENVIRONMENTAL IMPACT

##### Effluent Quality

The Pana WWTP is an advanced treatment plant employing chemical precipitation for phosphorus removal by the addition of lime (2TR. 10). It has a design average flow capacity of 1.17 MGD and a design maximum flow capacity of 3.3 MGD. Grab sample tests by IEPA during periods of non-phosphorus removal and by Pana during periods while phosphorus was being removed, from 1985-1987, yielded effluent test results. From these results estimated phosphorus loadings were calculated (2TR. 10-11). Based upon these results, the estimated phosphorus concentrations and loading to receiving waters would be:

	<u>Petition Denied</u>	<u>Petition Granted</u>	<u>Difference</u>
Concentration	1.0 mg/l	2.98 mg/l	1.98 mg/l
Loadings (per day)	4.082 Kg	12.166 Kg	8.084 Kg
Loadings (per year)	1,487 Kg	4,440 Kg	2,953 Kg

(Id.)

Pana would contribute 1,487 kg/year of total phosphorus to the receiving water if the petition is denied; 4,440 kg/year if the petition is granted. The concentrations of total phosphorus in the Carlyle Reservoir would increase 0.0045 mg/l if the petition is granted. The present total concentration in Lake Carlyle is 0.25 mg/l (2TR. 12).

### Receiving Stream Character

The effluent from the Pana WWTP is discharged 54 miles upstream from Lake Carlyle. This discharge flows through Coal Creek, Opossum Creek, Beck Creek and the Kaskaskia River before entering the lake. All three creeks experience natural 7-day, 10-year zero low flows. Each of the streams yielded fish, mostly small-sized, during 1983 fish surveys conducted by the Illinois Department of Conservation (2Exh.1, p.4). The samples also yielded good diversity (2TR. 54-55). These samples were taken when Pana's phosphorus controls were not operational and are assumed to be representative of the effect upon the receiving streams if Pana's petition were to be granted.

### Phosphorus Loading

The form of the total phosphorus changes from that at point of discharge as it travel downstream. At discharge the percentage of dissolved phosphorus to total phosphorus is on the order of 65-85 percent. As it proceeds downstream the percentage falls to 30-45 percent. Dissolved phosphorus is more readily available for biological uptake (1TR. 77).

Pana presented testimony that the numerical impact of phosphorus reduction from the WWTP is shown by a USEPA 1975 National Eutrophication Study (NES) which estimates that 97% of the phosphorus entering the reservoir is from non-point sources combined (Petition, Attachment 1). This condition is not expected to improve. At hearing Pana quoted from a Soil Conservation Service report that "a significant reduction of annual cropland soil loss and phosphorus loading is not anticipated in the foreseeable future, based upon current farming and erosion control technology" (1TR. 48). Pana asserts that the current farming practices do not indicate the large percentages of cropland under conservation tillages as was attested to in the R83-12 Shelbyville site-specific relief proceeding (1TR. 85). The representative of Blaser and Zeni testified that whether the non-point source loadings are actually higher or not is largely irrelevant. Lake Carlyle is so large that Pana's contributions are still slight (TR. 30-35).

### Effects upon Carlyle Reservoir

Testimony revealed that the Carlyle Reservoir can be characterized as nutrient-enriched. By depth-transparency measures and phosphorus concentration, it is considered eutrophic (2TR. 12-13). Biological manifestations such as heavy algae blooms as measured by chlorophyll a are not present, however. Phosphorus does not appear to be the limiting nutrient; the critical factors are nitrogen-phosphorus ratios and turbidity. Id. Because phosphorus is not the limiting factor controlling primary plant production in Lake Carlyle, granting the petition would not affect aquatic biology or aquatic recreational expenditures (2TR. 17).

Pana also presented testimony that nitrogen and phosphorus are generally considered the two main nutrients in the eutrophication process, although not the only nutrients required for algae growth (1TR. 75, 2TR. 45-48). A five percent reduction in these nutrient levels will not have an effect on the algae growth in the lake where nutrient levels three to four times "higher than excessive" exist (1TR. 75). However, if light-limiting factors are removed and in-lake concentrations of nitrogen increase, a possibility arises of increasing primary production under these circumstances. Testimony did not reveal whether Lake Carlyle's nutrient levels were considered three to four times "higher than excessive." (2TR. 51).

#### TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

Pana's phosphorus removal system became operational in mid-1985 and is successfully treating the wastewater to achieve compliance. Pana did not argue, therefore, that phosphorus removal was not technically feasible.

Pana, however, contends that requiring it to comply with the phosphorus limitations will have a "terrible" impact on its finances (1TR. 7). A little better than 25 percent of the population is on fixed income and the City recently suffered the loss of several industries (1TR. 8). Past increases in water rates led to many complaints from people who were then unable to pay their bill (1TR. 10, 12).

In its petition, Pana estimated the cost savings from relief at \$29,570. The 1988 EcIS report, however, estimated savings in annual operations and maintenance costs at \$40,636. Any capital expenditures have already occurred and can not be considered. Pana also submitted a cost analysis and operational impact report for its wastewater treatment plant with its petition. This report demonstrated the increased average monthly use charge from equipment installation for phosphorus removal totalled \$1.45 per month per user or connection. The average water bill is \$30.00 bi-monthly (1TR. 91).

Pana did not, however, estimate what operation and maintenance costs would be if there were no phosphorus effluent limit whatsoever imposed upon the Pana facility nor for any alternatives to the removal method chosen (1TR. 58). Pana dismissed as prohibitively expensive any phosphorus control alternatives other than the lime-addition treatment chosen (1TR. 61).

#### AGENCY RECOMMENDATION



As stated previously, at the hearing of April 9, 1985, the Agency recommended that the decision on this case be delayed because of its pending phosphorus proposal (1TR. 103). The Agency stated it would however, support any variance requests for those municipalities which did not have phosphorus hardware in place which resulted from any delay. For those cities which did, the Agency representative testified they would "have that heard and would delay that variance until the further measure of point source phosphorus controls are known" (1TR. 104). As recounted in the discussion of procedural history, the Agency urged the Board to provide relief to the City of Pana, but suggested that it might be better to act on the Agency's phosphorus proposal first (2TR. 27). At the Agency's suggestion, this was the course chosen by the Board.

#### CONCLUSION

The Board is persuaded that Pana's discharge meets the requirements necessary to gain relief from the 1 mg/l phosphorus standard. Pana's discharge does not significantly contribute to eutrophication of the receiving waters. Therefore the Board decides today to grant Pana relief consistent with its Amended Petition and elects to set the applicable effluent limitation standard for Pana's WWTP discharge at 2.8 mg/l of phosphorus as P. This site-specific relief is proposed for First Notice publication as contained in today's Order.

The decision in this case cannot be made without distinguishing our prior decision in Shelbyville. [In the Matter of Site Specific Phosphorus Limitation for the City of Shelbyville, 62 PCB 31, R83-12 (December 20, 1984)]. There, too, a city discharging to the Lake Carlyle reservoir had requested relief from the phosphorus water quality standard and related effluent limitations due to economic considerations. Shelbyville had contended that upgrading its wastewater treatment plant to adequately control phosphorus imposed hardship upon the city and would have no significant effect upon the reservoir. (62 PCB 32) Despite testimony that the City was under financial strain, the estimated cost of the WWTP upgrading totalled \$4.7 million and the phosphorus loadings to Lake Carlyle from the City were 1.8% of the total, the Board declined to grant relief. The Board found that despite the low total percentages, the phosphorus from point sources such as Shelbyville's were an important contributor to eutrophication in the Carlyle Reservoir and that granting Shelbyville site-specific relief would both add to the problem and set poor precedent for similarly situated communities (62 PCB 36-7).

Since our decision in Shelbyville, however, the Board has acted on the Agency's request to modify the state-wide rules of general applicability for phosphorus, R87-6. These finalized rules provide for an adjusted standard procedure, whereby a petitioner may be granted an exception to the general phosphorus rule upon a specific showing. The adjusted standard proceeding was intended to allow for a streamlined consideration of a

permanent, site-specific petition to utilize this mechanism for relief, it chose to proceed with its pending request. Although Pana could have readily converted its petition to utilize this mechanism for relief, it chose to proceed with its pending request. However, the Board will look to the following factors set forth in Section 304.123 of its rules for guidance in reaching its determination. Section 304.123 provides that "...the applicant prove that the effluent resulting from grant of the adjusted standard will not contribute to cultural eutrophication, unnatural plant or algal growth or dissolved oxygen deficiencies in the receiving lake or reservoir. Such effluent is deemed to contribute to such conditions if phosphorus is the limiting nutrient for biological growth in the lake or reservoir, taking into account the lake or reservoir limnology, morphological, physical and chemical characteristics, and sediment transport. However, if the effluent discharge enters a tributary at least 40.25 kilometers (25 miles) upstream of the point at which the tributary enters the lake or reservoir at normal pool level, such effluent is not deemed to contribute to such conditions if the receiving lake or reservoir is eutrophic and phosphorus from internal regeneration is not a limiting nutrient." 35 Ill. Adm. Code 304.123(c)

The record demonstrates that Pana's discharge is more than 25 miles upstream of Lake Carlyle. Because of existing conditions in Lake Carlyle the increased phosphorus loadings caused by granting Pana site-specific relief do not significantly contribute to cultural eutrophication or algae growth. Growth in the lake appears to be limited either by the amount of nitrogen or by the low levels of light available for plant growth. Therefore, granting Pana relief is consistent with the new phosphorus rules.

In both its Petition and Amended Petition, Pana requests an exemption from 35 Ill. Adm. Code 304.105, the prohibition against contributing to or causing a violation of a water quality standard. Pana did not propose language which would accomplish this. No record was developed concerning this request which would assist the Board in making any determination with respect to this issue. Therefore the Board takes no action on the issue.

As a final matter, it should be noted that our decision today should in no way be considered an abrogation of our position regarding site-specific relief set forth in Greater Peoria Sanitary District. [In the Matter of: Site-Specific Exception to Effluent Standards for the Greater Peoria Sanitary and Sewage Disposal District, 93 PCB 79, R87-21 (October 6, 1988)]. In Greater Peoria, the Board determined that the applicant's proof regarding economic reasonableness had failed. The intervention of the new phosphorus rules and, particularly, the specific showing to be made in an adjusted standard proceeding thereunder, serves to further distinguish the two.

ORDER

The following site-specific rule is hereby proposed. The Clerk of the Board is directed to submit this rule to the Secretary of State for First Notice publication in the Illinois Register.

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

PART 304  
 EFFLUENT STANDARDS

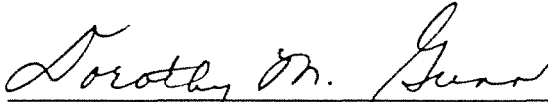
SUBPART B: SITE-SPECIFIC RULES AND  
 EXCEPTIONS NOT OF GENERAL APPLICABILITY

304.218            City of Pana Phosphorus Discharge

The general effluent standard for phosphorus as P contained in Section 304.123 shall not apply to discharges from the City of Pana wastewater treatment plant. Instead these discharges shall comply with an effluent limitation of 2.8 mg/l phosphorus as P as measured at the point of discharge.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Opinion and Order was adopted on the 7<sup>th</sup> day of June, 1990, by a vote of 7-0.

  
 Dorothy M. Gunn, Clerk  
 Illinois Pollution Control Board