

ILLINOIS POLLUTION CONTROL BOARD  
March 26, 1975

CITY OF MOUNT VERNON, )  
 )  
 ) Petitioner, )  
 )  
 )  
 ) v. ) PCB 74-489  
 )  
 ) ENVIRONMENTAL PROTECTION AGENCY, )  
 )  
 ) Respondent. )

OPINION AND ORDER OF THE BOARD (by Mr. Dumelle):

The City of Mount Vernon ("Petitioner") filed a variance petition on December 27, 1974. The Illinois Environmental Protection Agency ("Agency") filed a Recommendation to grant the variance on February 6, 1975. No hearing was held.

Petitioner operates a secondary sewage treatment facility located in Jefferson County. Petitioner's sewage treatment plant discharges to Casey Fork, approximately 7-1/4 miles upstream from where Casey Fork enters Rend Lake. Rend Lake discharges into the Big Muddy River which is a tributary of the Mississippi River.

Petitioner's sewage treatment plant has an average influent of 1.86 million gallons per day (mgd). Petitioner states that its present plant produces an effluent with the following average values:

Average BOD <sub>5</sub>	4.2 mg/l
Suspended Solids	22.3 mg/l
Ammonia nitrogen	5.4 mg/l (as nitrogen)
Phosphorus	8.1 mg/l

Because Casey Creek has a 7-day 10-year low flow of zero, Petitioner's effluent must not cause a violation of the 0.05 mg/l of phosphorus requirement of Rule 203(c) at the entrance to Rend Lake and the 1.5 mg/l ammonia nitrogen standard of Rule 203(f) of the Water Pollution Regulations. Rule 404(f) provides that for discharges to streams with less than 1:1

dilution that the effluent shall not exceed 4 mg/l of BOD<sub>5</sub> and 5 mg/l of suspended solids. Petitioner has requested a variance from the above three provisions.

Petitioner is in the process of upgrading its existing sewage treatment facility and has obtained both a Step I and Step II Federal Assistance Grant to help pay the cost of drawing up final plans and specifications for the proposed upgrading. Petitioner has a construction grant priority of 116. On December 19, 1974 Petitioner was issued a National Pollutant Discharge Elimination System (NPDES) Permit by the United States Government. Petitioner states that its proposed treatment plant is tentatively scheduled for completion in January of 1977. Petitioner's NPDES Permit requires completion of construction by June 30, 1977 and attainment of full operation by July 30, 1977. The Agency estimates that the treatment system should be in operation by October 1, 1977. Petitioner estimates that following completion of the proposed treatment plant it will discharge an effluent with the following characteristics:

Average Dry Weather Flow	3.8 mgd
Average BOD <sub>5</sub>	10 ppm
Average Suspended Solids	12 ppm
NH <sub>3</sub> (Ammonia Nitrogen)	1.5 ppm
Phosphorus	0.05 ppm

Although estimating compliance with the phosphorus requirement of Rule 203(b), Petitioner states that there is no evidence that removal of phosphorus down to the requirement set forth in the Rule is technically feasible. The Agency points out that Petitioner's NPDES Permit sets forth final standards of 4 mg/l for BOD<sub>5</sub> and 5 mg/l for suspended solids. The Agency states that Petitioner may discharge 10 mg/l of BOD<sub>5</sub> and 12 mg/l of suspended solids only if granted a "Pfeffer exemption" under Rule 404(f)(ii). The Agency questions whether Petitioner will ever be capable of consistently discharging an effluent with a phosphorus concentration of no more than 0.05 mg/l and therefore recommends that Petitioner be granted a variance from Rule 404(f)(ii)(A), (D), and (E) as they pertain to obtaining a phosphorus concentration of 0.05 mg/l. The Agency's recommendation is conditioned on the installation by Petitioner of best available nutrient removal facilities as soon as possible in conjunction with the proposed upgrading of Petitioner's sewage treatment plant.

Petitioner alleges that to require compliance with the three rules would impose an arbitrary and unreasonable hardship during the period it is proceeding to complete its

updated sewage treatment plant. Petitioner alleges that the use of chemical precipitation to enhance its effluent quality is not feasible because it would overload Petitioner's existing sludge digesters. Petitioner further alleges that satisfactory land is not available for spray irrigation and that soils found in the area are shallow silts, underladen by tight clays and hardpan with the result that spray irrigation could cause surface runoff with no appreciable water quality benefits. Petitioner states that transportation of its effluent to a watershed other than that of Rend Lake would require transporting the waste a distance of 17 miles east to the Skillet Fork watershed into a low flow stream. Petitioner states that the dissolved oxygen content of Casey Creek is substantially higher downstream from its discharge than upstream and that even considering the dissolved oxygen sag due to carbonaceous and nitrogenous oxygen demand, that the downstream level of dissolved oxygen does not approach a critical level.

The Agency states that Petitioner is operating its sewage treatment plant as efficiently as possible and that no greater pollutant removal can be achieved without the addition of more treatment facilities. The Agency recommends that the Board not require such interim treatment facilities because the time required to design and install them would be roughly equivalent to the time required to carry out Petitioner's proposed upgrading of its sewage treatment plant.

The Board finds that Petitioner would suffer an arbitrary and unreasonable hardship if required to achieve compliance immediately with Rule 203(c), 203(f), and 404(f). However, Petitioner does discharge a significant amount of phosphorus to Rend Lake based upon a materials balance. Petitioner states that the average phosphorus concentration in Rend Lake, based upon a water quality value of 0.08 ppm is 63,968 pounds. Converting Petitioner's average effluent phosphorus value of 8.1 ppm to a yearly value results in an estimated contribution of 45,891 pounds. The Agency calculated that Petitioner's discharge amounted to 126 pounds of phosphorus per day as compared to the 83.9 pounds of phosphorus contained in Casey Fork upstream from Petitioner's discharge.

The Agency states that Petitioner's discharge of phosphorus could be the source of additional algal growth in Rend Lake. However, the Agency believes that the additional algal growth has little immediate adverse environmental effect, but that continued addition of decomposable plant growth could shorten the life of the Lake. The Board agrees with the Agency concern over future additional discharges of phosphorus to

lakes or reservoirs. This was the reason for the adoption by the Board of Rule 203(c). The Board therefore will condition the grant of this variance upon requirement to add nutrient removal facilities in conjunction with the proposed upgrading. In addition, any extension of this variance will have to contain a more detailed evaluation of methods of compliance with the phosphorus requirements of Rule 203(c) or alternative means of discharges such as land application or diversion from the Rend Lake watershed.

The record in this case is not wholly satisfactory. Little is said by either party as to the extent of algae blooms, if any, on Rend Lake. The 0.05 mg/l phosphorus level of Rule 205(c) may not necessarily be an effluent standard, but is a stream standard at the confluence with Rend Lake. If significant amounts of phosphorus "drop out" in the 7-1/4 mile length of Casey Fork then a higher amount of phosphorus could perhaps be discharged by Mount Vernon. But no data are given on this point.

Lastly, the state of dissolved oxygen levels in the hypolimnion (if one exists) in Rend Lake are not given. If, in fact, algae growth on Rend Lake is significant, then the Board should be told what effects this algae growth is having upon dissolved oxygen levels. Also it is not wholly correct to compare the suspended phosphorus in Rend Lake's waters with incoming loads. In Lake Erie, more than 95% of incoming phosphorus "disappears" presumably to sediments. What is significant is the rate of increase of phosphorus in the water. Rend Lake is shallow and wind currents may suspend sediment, thus giving apparently high phosphorus levels. But is this phosphorus in a form that will support algae growth? In future or similar proceedings, these questions must be answered.

Because Petitioner is required to obtain an NPDES Permit, the Board may grant Petitioner a variance for up to a five year period. The Board has determined that Petitioner should be granted a variance until July 1, 1977 because of legal deadlines.

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

#### ORDER

The Pollution Control Board hereby grants the City of Mount Vernon a variance from January 1, 1975 to July 1, 1977 from Rules 203(c), 203(f) as pertains to ammonia nitrogen, Rule 404(f) as pertains to BOD<sub>5</sub> and suspended solids, and Rule 404(f)(ii)(A), (D), and (E) as pertains to phosphorus

subject to the following conditions:

1. Petitioner keep abreast of developments in phosphorus removal technology and shall report quarterly to the Agency;
2. Petitioner apply advanced phosphorus removal techniques as such techniques become practicable;
3. Petitioner continue to pursue its present program of upgrading its sewage treatment plant including nutrient removal facilities;
4. Petitioner maintain and operate its sewage treatment plant in the manner that will maximize the quality of effluent;
5. Petitioner apply for and obtain all necessary permits.
6. Effluent limits (on a monthly average) shall not exceed:

Average BOD <sub>5</sub>	4.2 mg/l
Suspended Solids	22.3 mg/l
Ammonia Nitrogen	5.4 mg/l (as nitrogen)
Phosphorus	8.1 mg/l

IT IS SO ORDERED.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion and Order were adopted on the 26<sup>th</sup> day of March, 1975 by a vote of 4-0.

  
Christan L. Moffett, Clerk  
Illinois Pollution Control Board