

ILLINOIS POLLUTION CONTROL BOARD  
September 20, 1984

MOBIL OIL COMPANY, )  
 )  
 ) Petitioner, )  
 )  
 ) v. ) PCB 84-37  
 )  
 ILLINOIS ENVIRONMENTAL PROTECTION )  
 AGENCY, )  
 )  
 ) Respondent. )

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

On March 29, 1984 Mobil Oil Company filed a petition for variance extension from 35 Ill. Adm. Code 304.122 as it relates to the 3.0 mg/l ammonia nitrogen standard applicable to its Joliet Refinery's discharge into the Des Plaines River. An amended petition was filed on May 11, 1984 in response to a Board more information Order dated April 5, 1984. On June 18, 1984 the Illinois Environmental Protection Agency (Agency) filed a recommendation that the variance be granted subject to certain conditions. On July 31, 1984 Mobil filed a motion to file supplementary information. On August 2, 1984 the Board denied the motion but admitted the information as an amended petition. On September 4, 1984 the Agency filed a first amended recommendation and motion to supplement the record by incorporating the record of R84-16 into this variance proceeding. The Board denied the motion but held that because Mobil agreed to the Agency's motion that in effect it was an amended petition. The Board will vacate the Order of September 6, 1984 in this matter and grant the Agency's motion, thereby incorporating the regulatory record. On September 8, 1984 Mobil filed a motion for leave to file instanter a response to the Agency's first amended recommendation, which is granted, and a motion for expedited consideration, which is denied as being unnecessary. The Board notes that since this is a variance petition from an NPDES permit, the Board has 120 days to render a decision. Hearing was waived and none was held.

Mobil owns and operates a conventional fuels petroleum refinery with a rated capacity of 180,000 barrels per day located in Will County. The refinery discharges 2.74 million gallons of effluent per day. Stormwater, noncontact cooling water and process water are discharged from the facility into the Des Plaines River. The process water and contaminated surface runoff (1600 gpm) are treated in Mobil's wastewater treatment plant (WWTP) which consists of an API separator, a dissolved air flotation unit, an equalization basin for primary treatment and a conventional activated sludge facility for secondary

treatment. Treated effluent from the final clarifier is routed through a 4.9 million gallon guard basin where it is retained for approximately 51 hours and then aerated in the final aeration cone prior to release to the Des Plaines River. The effluent meets all discharge standards other than ammonia nitrogen.

Mobil has been granted four previous variances from the ammonia nitrogen standard of section 304.122 (old Rule 406, Chapter 3): (PCB 77-22, PCB 78-97, PCB 80-54, and PCB 82-36). In PCB 82-36 (47 PCB 271, June 10, 1982) variance was granted until July 1, 1984, subject to certain conditions including an ammonia nitrogen effluent limitation of 25 mg/l monthly average and 40 mg/l daily maximum concentration.

Mobil has substantially complied with all the terms and conditions of the latest variance. The only excursions from the interim limitations during the prior variance period were in December, 1982 as shown in Table 3 of the Amended Petition. The overall average ammonia reduction from influent levels was 83% in 1983 as compared to 50% in 1982. During the prior variance, Mobil complied with the 3 mg/l standard 64% of the time in 1983 as compared to 12.7% in 1982 on NPDES monitoring dates.<sup>1/</sup>

Mobil has expended considerable time and effort in its attempt to reach ultimate compliance with the ammonia standards. The total cost of capital expenditures for the last ten years is in excess of \$2.1 million (Am. Pet. Table 2). The average operating cost for ammonia reduction projects during the last five years has been \$1,660,000 per year, including amortization of capital investments (Id.). Equalization system improvements and continuous dissolved oxygen monitoring in the aeration basins cost an additional \$52,000 during 1982/1983 (Am. Pet. at 3). Projects have included the purchase and installation of a nitrification pilot plant, nitrification inhibition studies, mutant bacteria trials, alkalinity addition and temperature control in the aeration basins. Since 1973 these efforts have reduced Mobil's discharged ammonia concentration by 95 percent. However, Mobil has been unable to consistently meet the ammonia nitrogen standard or identify the technology needed to do so (Am. Pet. at 8).

The environmental impact of the granting of variance is minimal. The net increase in river ammonia nitrogen concentration has been calculated as 0.008 mg/l. The minimum dissolved oxygen concentration downstream in the Illinois River below Pekin was 5.7 mg/l for the first nine months of 1982 and 5.5 mg/l in 1981. Further reduction of Mobil's ammonia nitrogen discharge is not possible given the lack of reasonably available technology. Mobil will continue efforts to reduce its ammonia nitrogen discharge.

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<sup>1/</sup> NPDES monitoring frequency for ammonia was reduced from five times to twice per week as of February, 1983.

Given that technically and economically feasible means of meeting the standard have not been identified despite Mobil's diligent efforts and the minimal environmental impact of granting the variance, the Board finds that denial of variance would impose an arbitrary or unreasonable hardship. A variance will be granted for a period of two years.

Mobil requests that the interim limitations from the prior variance for ammonia nitrogen be extended. The Agency recommends 10 mg/l monthly average and 30 mg/l daily maximum. Mobil's own expert testified in R84-16 that at the 95th percentile level, Mobil could consistently comply with ammonia nitrogen effluent standards of 25 mg/l monthly average and 35 mg/l daily maximum (Pet. Ex. 2, 53; Ex. C, p. 2 to Mobil 7/31/84 motion) even though a few excursions are expected to occur (R84-16 at 104, 107). By introducing process modifications the probability of exceeding the 25/35 standards at all would be reduced (R84-16 at 108).

As for the Agency recommended standards, the same expert testified that they could not be consistently met (R84-16 at 105). The ratio of the ammonia nitrogen concentration peak value versus the average influent value to the pre-stripper equalization tank showed that the maximum concentration range is approximately 1.9 to 4.7 times above the average value (R84-16 at 52). Using a ratio of the peak value versus the average stripper effluent value, the ratios become higher (Id.). The higher ratios indicate that performance variability of the stripper during some periods is much greater than that of the pre-stripper equalization stage (Id.). Thus, the variability in the stripper effluent quality increases the ammonia nitrogen loading to the WWTP, and consequently in the final effluent (R84-16 at 50, 52). As the nitrogen concentration of the crude oil increases, so does the nitrogen concentration influent to the WWTP and in the final effluent (R84-16 at 122). Therefore, the Board will impose ammonia nitrogen effluent standards of 25 mg/l monthly average and 35 mg/l daily maximum as conditions of this variance.

The Board notes that Mobil has been operating under four variances for more than five years without having presented a compliance plan. While the filing for site-specific regulatory relief does not obviate the need for a compliance plan in a variance proceeding, the Board realizes that in some fact situations the technology does not exist for a petitioner to reasonably reach compliance. In that event, the conducting of research aimed at finding a means of coming into compliance is sometimes accepted as a compliance plan. The Board will order Mobil to continue its research into ways of reducing its ammonia nitrogen discharge. Mobil has filed for site-specific relief from the ammonia nitrogen standard (R84-16).

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

ORDER

Mobil Oil Corporation is hereby granted a variance from 35 Ill. Adm. Code 304.122 from July 1, 1984 until July 1, 1986 subject to the following conditions:

1. Mobil's ammonia nitrogen effluent discharge shall not exceed a monthly average concentration of 25 mg/l and a daily maximum concentration of 35 mg/l during the period of this variance.
2. Mobil shall continue its research aimed at complying with the ammonia nitrogen standard and shall continue to submit bi-monthly reports to the Agency outlining its efforts to achieve compliance with 35 Ill. Adm. Code 304.122, including any studies on nitrification inhibition, alkalinity addition and any further pilot plant testing.
3. The Board Order in this proceeding dated September 6, 1984 is vacated and the Agency motion to incorporate the record in R84-16 is hereby granted.
4. Within 45 days of the date of this Order, Mobil shall execute and forward to the Illinois Environmental Protection Agency, Compliance Assurance Unit, Water Pollution Control Division, 2200 Churchill Road, Springfield, Illinois 62706, a Certification of Acceptance and Agreement to be bound to all terms and conditions set forth in the Order. The 45 day period shall be held in abeyance during any period in which this matter is being appealed. The form shall be as shown below:

CERTIFICATION

I, (We), \_\_\_\_\_, hereby accept and agree to be bound by the above terms and conditions of the Order of the Pollution Control Board in PCB 84-37 dated September 20, 1984.

\_\_\_\_\_  
Petitioner

\_\_\_\_\_  
By: Authorized Agent

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

- 5. Mobil's motion for leave to file instanter a response to the Agency's first amended recommendation is hereby granted.
- 6. Mobil's motion for expedited decision is hereby denied as being unnecessary.

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 20<sup>th</sup> day of September, 1984 by a vote of 6-0.

Dorothy M. Gunn  
 Dorothy M. Gunn, Clerk  
 Illinois Pollution Control Board