

ILLINOIS POLLUTION CONTROL BOARD

December 4, 1997

IN THE MATTER OF: )  
 )  
SITE SPECIFIC PETITION OF MOBIL OIL ) R97-28  
CORPORATION FOR RELIEF FROM ) (Rulemaking - Water)  
35 ILL. ADM. CODE 304.122, AMMONIA )  
NITROGEN EFFLUENT STANDARDS )

Proposed Rule. Second Notice.

OPINION AND ORDER OF THE BOARD (by G.T. Girard):

This matter comes before the Board upon a petition for rulemaking filed by Mobil Oil Corporation (Mobil) on April 24, 1997. Mobil requests that the Board's effluent regulations, as applicable to Mobil's refinery near Joliet, be amended to provide site-specific ammonia nitrogen effluent standards for Mobil's discharge to the Des Plaines River.

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 et seq. (1996)). The Board is charged therein to "determine, define and implement the environmental control standards applicable in the State of Illinois." 415 ILCS 5/5(b). More generally, the Board's rulemaking charge is based on the system of checks and balances integral to Illinois environmental governance: the Board bears responsibility for the rulemaking and principal adjudicatory functions; the Illinois Environmental Protection Agency (Agency) has primary responsibility for administration of the Act and the Board's regulations, including the regulations today proposed for amendment. The Agency has indicated that it supports adoption of the proposed amendments. Tr. at 12.

By today's action the Board adopts the proposed amendments for second notice, pursuant to the Illinois Administrative Procedure Act (5 ILCS 100/1-1 et seq. (1996)). The amendments as today adopted are identical to those proposed for first notice, with the exception of several small, non-substantive items suggested by the staff of the Joint Committee of Administrative Rules (JCAR).

BACKGROUND

Mobil owns and operates a petroleum refinery (Joliet Refinery) located near the Des Plaines River in western Will County, approximately 10 miles southwest of Joliet. The refinery, which began operations in 1973, is Mobil's newest domestic refining facility. Pet. at 4. It has a rated capacity of 200,000 barrels of crude oil throughput per operating day and employs 575 persons. Pet. at 4. Products include motor gasolines and distillate fuel oil, kerosene jet fuel, propane, petroleum coke, sulfur, and some heavy fuel oil. Pet. at 4.

Water is used for various processes within the refinery. Waste process water, plus contaminated surface run-off, is processed through an on-site waste water treatment plant (WWTP) at an average rate of approximately 1900 gallons per minute. Pet. at 5. Discharge is to the Des Plaines River via an outfall nominated Outfall 001. Mobil holds a National Pollution Discharge Elimination System (NPDES) permit for this discharge. The ammonia nitrogen concentration of this discharge is the subject matter of the instant proceeding.

### REGULATORY BACKGROUND

The Board has promulgated various regulatory provisions that govern effluent discharges. Among these are provisions related to the discharge of ammonia nitrogen to the Illinois River, the Calumet River System, and parts of the Des Plaines River, as found at 35 Ill. Adm. Code 304.122. Subsection 304.122(b) contains the provision applicable to the Joliet Refinery. In pertinent part, Subsection 304.122(b) provides that:

Sources . . . whose untreated waste load cannot be computed on a population equivalent basis comparable to that used for municipal waste treatment plants and whose ammonia nitrogen discharge exceeds 45.4 kg/day (100 pounds per day) shall not discharge an effluent of more than 3.0 mg/l of ammonia nitrogen.

The 3.0 mg/L standard of Section 304.122(b) applies to monthly average samples, as specified at 35 Ill. Adm. Code. 304.104(a)(1).

In 1988 the Board granted Mobil a site-specific rule to supplant temporarily the Section 304.122(b) rule.<sup>1</sup> This site-specific rule, found at 35 Ill. Adm. Code 304.214, provided ammonia nitrogen discharge limits for Mobil's Joliet Refinery of 20 mg/L measured as a monthly average and 35 mg/L measured as a daily composite. Section 304.214 expired by its own terms on December 31, 1993. However, Section 304.214 has not been repealed, and thus still remains within the corpus of the Board's regulations.

Prior to the expiration of Section 304.214, Mobil petitioned the Board for a variance from the underlying regulation at Section 304.122. The Board granted the variance on March 3, 1994.<sup>2</sup> This variance was scheduled to terminate on March 3, 1998, and, among other matters, required that if Mobil were to seek new and permanent site-specific relief, it do so by May 3, 1996. During the period of this variance, ammonia nitrogen discharges were capped at a maximum of 13 mg/L measured as a monthly average and 26 mg/L measured as a daily maximum.

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<sup>1</sup> In the matter of: Proposal of Mobil Oil Corporation to Amend the Water Pollution Regulations (January 7, 1988), R84-16.

<sup>2</sup> Mobil Oil Corporation v. Illinois Environmental Protection Agency (March 3, 1994), PCB 93-151.

On August 15, 1996, the Board granted Mobil a variance modification that extended the end date of the variance until March 3, 1999, and extended the date for filing for standards alternative to those at Section 304.122(b) until May 3, 1997.<sup>3</sup> With the filing of the instant petition, Mobile has complied with the filing date requirement.

In the instant proposal Mobil requests that ammonia nitrogen effluents limits applicable to the Joliet Refinery be permanently set at 9.0 mg/L measured as a monthly average and 23.0 mg/L measured as a daily maximum. Mobil further requests that this proposal be effectuated by reactivation of Section 304.214, with the new effluent limits replacing the old, and with the old expiration date deleted.

### PROCEDURAL HISTORY

A public hearing in this matter was held before hearing officer Audrey Lozuk-Lawless in Bolingbrook, Illinois, on July 2, 1997. Mobil presented three witnesses: Lilliana Gachich, Environmental Advisor employed by Mobil; James E. Huff of Huff & Huff, Inc.; and John H. Koon of Parsons Engineering Science, Inc.

Mobil filed a post-hearing brief on July 28, 1997. The record in this matter was scheduled to close on July 28, 1997. On August 6, 1997, the Environmental Bureau of the Illinois Attorney General's office filed a motion for leave to file comments instanter and accompanying comments. PC 1. On August 11, 1997, the hearing officer issued an order granting the motion instanter and accepting the comments. Given the technical nature of the comments, and to allow response from the Agency and Mobil, the hearing officer extended the time the record would remain open until August 25, 1997.

By order of September 18, 1997, the Board adopted Mobil's proposal for first notice. First notice publication occurred in the *Illinois Register*, Vol. 21, Issue 41, October 10, 1997, at p. 13500 et seq.

The first notice rule as adopted by the Board was substantially identical to that proposed by Mobil, with the exception of proposed termination (sunsetting) of the rule on December 21, 2007. The Board declined at first notice to require that Mobil install breakpoint chlorination, as urged by the Attorney General but opposed by the Agency.<sup>4</sup>

Two public comments were filed during the first notice comment period, one each by Mobil (PC 4) and the Agency (PC 5). Both urge adoption of the amendments as proposed for first notice, including adoption of the ten-year sunset provision.

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<sup>3</sup> Mobil Oil Corporation v. Illinois Environmental Protection Agency (August 15, 1996), PCB 96-218.

<sup>4</sup> See pages 5-6 of the Board's September 18, 1997 opinion and order.

## JUSTIFICATION

### Environmental Considerations

Mobil believes that the environmental impact of the proposed ammonia nitrogen load in the Des Plaines River will be insignificant. Pet. at 12. Mobil presented a study conducted by Huff & Huff, Inc. indicating that at the proposed standards, continued discharge of ammonia nitrogen would not significantly change the levels of ammonia nitrogen in the Des Plaines or Illinois Rivers, nor would it threaten water quality or the aquatic community in those rivers.

Mobil's contention is based principally on the relatively large amount of dilution that is available in the receiving waterway, the relatively small size of the discharge plume, and speed with which mixing occurs. Exh. 5. On this basis, Mobil concludes that discharge under the terms of the proposed site-specific standards will not cause violation of the in-stream water quality standards either at the point of discharge or downstream. Pet. at 12-13.

It is noteworthy that at the point at which discharge to the Des Plaines River occurs, the river is classified as a secondary contact waterway. 35 Ill. Adm. Code 303.441(i). The applicable water quality standard for secondary contact waters is 0.1 mg/L of un-ionized ammonia nitrogen. 35 Ill. Adm. Code 302.407. Mobil contends that it could discharge total ammonia nitrogen at concentrations as high as 70 mg/L in the summer and 243 mg/L during the winter, and still maintain compliance with the water quality standard at the edge of a mixing zone. Exh. 5 at 17-18.

The secondary contact portion of the Des Plaines River extends downstream as far as the I-55 bridge (35 Ill. Adm. Code 303.441(i)), which is approximately 1,000 feet downstream from Mobil's 001 outfall (Tr. at 53). Mobil contends that its proposed discharges would not cause violation of the ammonia general use water quality standards applicable downstream from the I-55 bridge. Tr. at 52.

Ms. Lilliana Gachich also testified that the water conservation efforts at the Joliet refinery inevitably result in a more concentrated effluent. Exh. 1. Mobil lessens the water discharge to the sewer by increasing in-plant water reuse and increasing cooling tower recycling. Exh 1. This highly concentrated effluent may impede the treatment because there is less dilution in the discharge water than is typical for similar plants. Tr. at 15. Nevertheless, Mobil contends that from an environmental perspective, it is behooved to practice water concentration. Tr. at 15.

The Agency did not comment specifically on the environmental aspects of Mobil's proposed standard.

### Economic Considerations and Alternative Technologies

Mobil has not been able to consistently comply with the Board's effluent standards due to an unstable nitrification process. Pet. at 2. However, Mobil has not found a

technologically reasonable and economically feasible ammonia nitrogen treatment system to meet the required standard consistently.

Mobil evaluated alternative technologies to meet the Board's ammonia nitrogen standard, and found that each has significant capital and operating costs. Mobil has already expended \$7.78 million on an Ammonia Optimization Study and related equipment upgrades to its treatment facility to meet the Board's effluent standards. Pet. at 13. Those expenditures have cost Mobil an average of \$16/lb of ammonia removed. However, the incremental cost to remove ammonia beyond the upgraded BAT system would be disproportionate, costing \$421/lb. Mobil estimates that this would increase capital costs \$920,000, and increase operating costs \$1.4 million. Pet. at 14. Furthermore, Mobil claims that "the other technologies will not be effective since the inhibition appears to arise also within the wastewater treatment system itself and not as a result of other waste streams." Pet. at 13.

### Sunset Provision

At first notice the Board proposed that the instant site-specific rule terminate by its own terms after ten years. The Board noted that Mobil has been able to comply with progressively lower ammonia discharge limits over the roughly ten-year history of this matter (e.g., 20 mg/L in the 1988 site-specific rule, 13 mg/L in the variance currently applicable, and 9 mg/L in the instant proposal). On this basis the Board proposed that this matter be revisited in another ten years to see whether today's requested discharge limits continue to be appropriate at that future time. Further, the Board requested that the participants address this issue of sunseting of the proposed rule in first notice comments. See September 19, 1997, opinion and order at p. 6-7. Mobil and the Agency have commented.

Mobil observes that although it "believes that it has amply proved its case for permanent relief and believes the record before the Board and the Board's opinion reflect that level of proof, Mobil does not object to the proposed sunset provision." PC 4 at 1. On this basis, Mobil urges that the first notice regulation be adopted as proposed.

The Agency also supports addition of the sunset provision, observing:

. . . the Illinois EPA notes that the termination date of December 31, 2007 would allow the passage of two five-year permitting cycles. During this time frame it is possible that new technology to treat ammonia nitrogen may become available, so revisiting the ammonia nitrogen issue in ten years would be beneficial. PC 5 at 1.

## Federal Consistency

According to Mobil, the “Joliet Refinery’s WWTP effluent parameters meet or are well below all federal effluent guidelines and standards for the appropriate petroleum refinery point source subcategory (40 CFR 419, Subpart B - Cracking Subcategory).” Pet. at 14. The flow rate used to derive the Best Available Technology (BAT) effluent values for a refinery the size and configuration of Joliet’s is 5200 gallons per minute (gpm), where the Refinery’s current flow rate is 1900 gpm, with a maximum hydraulic flow rate of 2500 gpm. The calculated BAT ammonia limit is 956 lbs/day monthly average and 2104 lbs/day daily maximum, where the Refinery’s current is 205 - 270 lbs/day. Pet. at 14.

## CONCLUSION

The Board believes that Mobil has presented evidence warranting continuing consideration of this matter. Accordingly, we today find that the record before us justifies adopting the proposal for second notice.

## ORDER

The Board hereby proposes for second notice the following amendments to 35 Ill. Adm. Code 304.214. The Clerk of the Board is directed to file these proposed rules with the Joint Committee on Administrative Rules.

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

PART 304  
EFFLUENT STANDARDS

SUBPART A: GENERAL EFFLUENT STANDARDS

|         |                                                    |
|---------|----------------------------------------------------|
| Section |                                                    |
| 304.101 | Preamble                                           |
| 304.102 | Dilution                                           |
| 304.103 | Background Concentrations                          |
| 304.104 | Averaging                                          |
| 304.105 | Violation of Water Quality Standards               |
| 304.106 | Offensive Discharges                               |
| 304.120 | Deoxygenating Wastes                               |
| 304.121 | Bacteria                                           |
| 304.122 | Total Ammonia Nitrogen (as N: STORET number 00610) |
| 304.123 | Phosphorus (STORET number 00665)                   |
| 304.124 | Additional Contaminants                            |
| 304.125 | pH                                                 |

- 304.126 Mercury
- 304.140 Delays in Upgrading (Repealed)
- 304.141 NPDES Effluent Standards
- 304.142 New Source Performance Standards (Repealed)

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

- | Section |                                                                                                                            |
|---------|----------------------------------------------------------------------------------------------------------------------------|
| 304.201 | Wastewater Treatment Plant Discharges of the Metropolitan Sanitary District of Greater Chicago                             |
| 304.202 | Chlor-alkali Mercury Discharges in St. Clair County                                                                        |
| 304.203 | Copper Discharges by Olin Corporation                                                                                      |
| 304.204 | Schoenberger Creek: Groundwater Discharges                                                                                 |
| 304.205 | John Deere Foundry Discharges                                                                                              |
| 304.206 | Alton Water Company Treatment Plant Discharges                                                                             |
| 304.207 | Galesburg Sanitary District Deoxygenating Wastes Discharges                                                                |
| 304.208 | City of Lockport Treatment Plant Discharges                                                                                |
| 304.209 | Wood River Station Total Suspended Solids Discharges                                                                       |
| 304.210 | Alton Wastewater Treatment Plant Discharges                                                                                |
| 304.211 | Discharges From Borden Chemicals and Plastics Operating Limited Partnership Into an Unnamed Tributary of Long Point Slough |
| 304.212 | Sanitary District of Decatur Discharges                                                                                    |
| 304.213 | UNO-VEN Refinery Ammonia Discharge                                                                                         |
| 304.214 | Mobil Oil Refinery Ammonia Discharge                                                                                       |
| 304.215 | City of Tuscola Wastewater Treatment Facility Discharges                                                                   |
| 304.216 | Newton Station Suspended Solids Discharges                                                                                 |
| 304.218 | City of Pana Phosphorus Discharge                                                                                          |
| 304.219 | North Shore Sanitary District Phosphorus Discharges                                                                        |
| 304.220 | East St. Louis Treatment Facility, Illinois-American Water Company                                                         |
| 304.221 | Ringwood Drive Manufacturing Facility in McHenry County                                                                    |
| 304.222 | Intermittent Discharge of TRC                                                                                              |

SUBPART C: TEMPORARY EFFLUENT STANDARDS

- | Section |                                                                    |
|---------|--------------------------------------------------------------------|
| 304.301 | Exception for Ammonia Nitrogen Water Quality Violations (Repealed) |
| 304.302 | City of Joliet East Side Wastewater Treatment Plant                |
| 304.303 | Amerock Corporation, Rockford Facility                             |

Appendix A References to Previous Rules

AUTHORITY: Implementing Section 13 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/13 and 27].

SOURCE: Filed with the Secretary of State January 1, 1978; amended at 2 Ill. Reg. 30, p. 343, effective July 27, 1978; amended at 2 Ill. Reg. 44, p. 151, effective November 2, 1978; amended at 3 Ill. Reg. 20, p. 95, effective May 17, 1979; amended at 3 Ill. Reg. 25, p. 190, effective June 21, 1979; amended at 4 Ill. Reg. 20, p. 53 effective May 7, 1980; amended at 6 Ill. Reg. 563, effective December 24, 1981; codified at 6 Ill. Reg. 7818; amended at 6 Ill. Reg. 11161, effective September 7, 1982; amended at 6 Ill. Reg. 13750, effective October 26, 1982; amended at 7 Ill. Reg. 3020, effective March 4, 1983; amended at 7 Ill. Reg. 8111, effective June 23, 1983; amended at 7 Ill. Reg. 14515, effective October 14, 1983; amended at 7 Ill. Reg. 14910, effective November 14, 1983; amended at 8 Ill. Reg. 1600, effective January 18, 1984; amended at 8 Ill. Reg. 3687, effective March 14, 1984; amended at 8 Ill. Reg. 8237, effective June 8, 1984; amended at 9 Ill. Reg. 1379, effective January 21, 1985; amended at 9 Ill. Reg. 4510, effective March 22, 1985; peremptory amendment at 10 Ill. Reg. 456, effective December 23, 1985; amended at 11 Ill. Reg. 3117, effective January 28, 1987; amended in R84-13 at 11 Ill. Reg. 7291 effective April 3, 1987; amended in R86-17(A) at 11 Ill. Reg. 14748, effective August 24, 1987; amended in R84-16 at 12 Ill. Reg. 2445, effective January 15, 1988; amended in R83-23 at 12 Ill. Reg. 8658, effective May 10, 1988; amended in R87-27 at 12 Ill. Reg. 9905, effective May 27, 1988; amended in R82-7 at 12 Ill. Reg. 10712, effective June 9, 1988; amended in R85-29 at 12 Ill. Reg. 12064, effective July 12, 1988; amended in R87-22 at 12 Ill. Reg. 13966, effective August 23, 1988; amended in R86-3 at 12 Ill. Reg. 20126, effective November 16, 1988; amended in R84-20 at 13 Ill. Reg. 851, effective January 9, 1989; amended in R85-11 at 13 Ill. Reg. 2060, effective February 6, 1989; amended in R88-1 at 13 Ill. Reg. 5976, effective April 18, 1989; amended in R86-17B at 13 Ill. Reg. 7754, effective May 4, 1989; amended in R88-22 at 13 Ill. Reg. 8880, effective May 26, 1989; amended in R87-6 at 14 Ill. Reg. 6777, effective April 24, 1990; amended in R87-36 at 14 Ill. Reg. 9437, effective May 31, 1990; amended in R 88-21(B) at 14 Ill. Reg. 12538, effective July 18, 1990; amended in R84-44 at 14 Ill. Reg. 20719, effective December 11, 1990; amended in R86-14 at 15 Ill. Reg. 241, effective December 18, 1990; amended in R93-8 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R87-33 at 18 Ill. Reg. 11574, effective July 7, 1994; amended in R95-14 at 20 Ill. Reg. 3528, effective February 8, 1996; amended in R94-1(B) at 21 Ill. Reg. 364, effective December 23, 1996; expedited correction in R94-1(B) at 21 Ill. Reg. 6269, effective December 23, 1996; amended in R97-28 at 21 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_.

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

PART 304  
EFFLUENT STANDARDS

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

Section 304.214 Mobil Oil Refinery Ammonia Discharge



- a) This Section applies to discharges from Mobil Oil Corporation's Refinery, located near Joliet, into the Des Plaines River.
- b) The requirements of Section 304.122(b) ~~shall do~~ not apply to Mobil's discharge. Instead Mobil's discharge ~~shall may~~ not exceed the following limitations:

| CONSTITUENT                        | CONCENTRATION<br>(mg/l) |
|------------------------------------|-------------------------|
| Ammonia Nitrogen                   |                         |
| Monthly Average                    | <del>20</del> 9.0       |
| Daily <del>Composite</del> Maximum | <del>35</del> 23.0      |

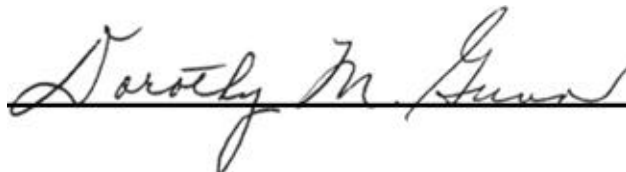
- c) Section 304.104(a) ~~shall does~~ not apply to this Section. Monthly average and daily composites are as defined in Section 304.104(b).
- d) Mobil shall monitor the nitrogen concentration of its oil feedstocks and report on an annual basis such concentrations to the Agency. The report shall be filed with the Agency by January 31 of each year.
- e) The provisions of this Section shall terminate on December 31, ~~1993~~2007.

(Source: Amended at 21 Ill. Reg. \_\_\_\_\_, effective \_\_\_\_\_)

IT IS SO ORDERED.

Board Member Kathleen M. Hennessey abstained.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 4th day of December 1997, by a vote of 5-0.



Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board