

ILLINOIS POLLUTION CONTROL BOARD  
August 22, 1984

UNION OIL COMPANY OF CALIFORNIA, )  
 )  
 Petitioner, )  
 )  
 v. ) PCB 84-129  
 )  
 ILLINOIS ENVIRONMENTAL )  
 PROTECTION AGENCY, )  
 )  
 Respondent. )

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

This provisional variance request comes before the Board upon an August 22, 1984 Recommendation of the Illinois Environmental Protection Agency (Agency). The Agency recommends that a 45-day provisional variance be granted to Union Oil Company of California (Union Oil) from 35 Ill. Adm. Code 304.120, 35 Ill. Adm. Code 304.124, 35 Ill. Adm. Code 304.125, and 35 Ill. Adm. Code 304.141(a) to allow it to bypass the wastewater treatment plant (WWTP) at its Chicago Refinery and discharge water to the Chicago Sanitary and Ship (S & S) Canal until repairs are completed and normal operation of its WWTP can be resumed.

The Petitioner is a corporation organized under the laws of the State of California and authorized to do business in the State of Illinois. Union Oil owns and operates a petroleum refinery, known as the Chicago Refinery, which is located near Lemont, Illinois in Will County. The Petitioner's refinery, which was constructed during the 1967 through 1970 time period, became operational in the spring of 1970. (1st Amended Pet. 2). The Chicago Refinery was the first major new petroleum refinery built in the United States during the 1970's. The Petitioner's refinery takes about 3.6 million gallons of water daily (mgd) from the Chicago S & S Canal and discharges approximately 3.3 mgd of effluent into this canal (the .3 mgd difference between influent intake and effluent discharge is due to cooling tower evaporation and steam losses).

The Chicago Refinery, which has a rated capacity of 154,000 barrels of crude oil per day and employs approximately 705 people, produces about 25 different petroleum-related products including conventional gasolines, jet airliner turbine fuel, diesel fuels, furnace oils for home heat, petroleum coke, and various specialty naphthas. The specialty naphthas that are produced can be manufactured into 200 intermediate products such as antifreeze,

dacron, detergent, industrial alcohols, synthetic rubber, and plastics. (1st Amended Pet. 2). The Petitioner estimates that 90% of the Chicago Refinery's output goes into making automobile gasolines, home heating oils, turbine fuels, and diesel fuels for use in Illinois and other midwestern states.

On July 23, 1984, substantial portions of the Chicago Refinery were damaged and destroyed as a result of an explosion and fire. Because of this accident, severe damage occurred to both the process units and the wastewater treatment plant at the refinery. The Petitioner has indicated that destruction of its alkylation unit released substantial quantities of sulfuric acid into the storm water basin and caused the pH of the water in some portions to drop below a pH of 2. (1st Amended Pet. 3). When Union Oil attempted to raise the pH of the storm water basin by the addition of a caustic, its attempted neutralization met with limited success because of a lack of mixing which apparently resulted in a stratification with over-neutralization occurring with pH ranging from 5 to 13. In its Recommendation, the Agency has stated that it believes "better operational control could have been used in the neutralization process." (Rec. 3). In order to achieve proper neutralization, efforts to improve the mixing are continuing. A special mixing sparger capable of pumping 2,200 gallons per minute of water has been fabricated and installed, and emergency power has been established for the storm water circulating pump. (1st Amended Pet. 3).

Because of the previously mentioned problems in maintaining the proper pH levels, water from the storm water basin cannot be discharged to the WWTP "without severely inhibiting the micro-organisms necessary to effect biological treatment of the wastewater." (1st Amended Pet. 3). Moreover, the pretreatment section of the WWTP was extensively damaged as a result of the explosion and fire, thereby necessitating numerous repairs to this equipment. For example, cracks in the equalization tank wall must be repaired before the tank will be able to hold water. Additionally, approximately 25% of the circumference of the sedimentation tank must be removed and replaced, along with major repairs to the effluent weir of the tank. Union Oil has stated that it estimates that the requisite repairs to the pretreatment system will take several weeks to accomplish. (1st Amended Pet. 3).

Because of the extensive damage to the refinery's process units and WWTP, the Petitioner is currently unable to meet the effluent limitations set forth in its NPDES Permit No. IL001589 (see: Exhibit A). Thus, Union Oil has requested a provisional variance to allow it to bypass its WWTP and discharge water directly into the Chicago S & S Canal until the necessary repairs are finished and normal operation of its WWTP can be resumed. Because the storm water basin is almost full and additional water is currently being received from rainfall (as well as from its fire protection system), the Petitioner needs to discharge water

from its plant. If the Petitioner does not discharge this water, an overflow into the Illinois and Michigan (I & M) Canal might result which could have potentially serious environmental consequences due to the low flow rate of the I & M Canal. Accordingly, Union Oil has discharged limited amounts of untreated water from the storm water basin to the Chicago S & S Canal pursuant to the malfunction and breakdown provisions of its NPDES Permit in order to avoid overflow of the storm water basin to the I & M Canal. Based on the storm water basin being full and additions due to the fire protection system during a two-week period, the estimated volume of water which will probably be discharged into the Chicago S & S Canal is approximately 70 million gallons. The Petitioner anticipates that this volume of water can be discharged at an average rate of 3,000 gallons per minute (i.e., 4.3 mgd) in about two weeks or more (depending on whether or not significant rainfall occurs during this time period).

The Petitioner has indicated that it will continue to re-establish appropriate biological activity at its WWTP as soon as practicable. Union Oil has already returned emergency power to the aeration basin and "a small population of microorganisms has been maintained by feeding them controlled quantities of methanol and phosphoric acid." (1st Amended Pet. 5). In an effort to build-up the population of micro-organisms, a small flow of water from the storm water basin is being charged directly to the aeration basin along with sanitary sewage. As long as micro-organism growth is not inhibited, the charge rate will be gradually increased. The flow rate to the WWTP will be gradually increased after the pretreatment system is returned to service until normal operating conditions are again established. Nonetheless, the Petitioner is currently unable to determine how quickly the WWTP can be returned to operation at a high flow rate while maintaining effective biological treatment. However, the Petitioner has maintained that there is no other method by which it can treat its wastewater since, should Union Oil not be allowed the discharge, there could be an unavoidable overflow into the I & M Canal having potentially serious consequences due to the low flow rate of the I & M Canal. (1st Amended Pet. 5-8).

Union Oil's waste treatment facilities include a flow equalization and storm water retention pond, two oil and water separators, a primary clarifier, activated sludge units, and a polishing pond. Aerators, which are powered by a portable generator, and artificial nutrient addition are currently keeping the organisms in the activated sludge units alive. (Rec. 2). The Agency believes that the flow equalization and storm water pond, along with the polishing pond, are presently operable despite the damage sustained, and that flows can be circulated through the primary tank to increase mixing for neutralization purposes and some sedimentation. (Rec. 2). However, Agency inspections of these facilities since the fire and explosion have revealed that electrical power was disrupted and that influent pumps to the WWTP are currently inoperable.

Because service must still be restored to other parts of the refinery, provision of permanent electrical service is expected to take some time. Although Union Oil has provided emergency electrical service via portable generators, there is insufficient electrical power to operate all equipment and the generators provide only enough electrical power to operate some aeration equipment and some pumps. (Rec. 3).

In its Recommendation, the Agency has noted that it "previously requested a commitment from Petitioner to provide the best operational control possible and a schedule for returning the plant to service." (Rec. 3). Because neither of these commitments were provided, the Agency has suggested that the Board impose a condition in its Order "to assure that the facilities are operated as well as possible and returned to service quickly." (Rec. 3). The Agency has also indicated that it is not persuaded by Union Oil's assertions pertaining to the reliability and representativeness of sampling data and emphasizes that the company has requested effluent limits far in excess of the "maximum values of samples collected by Petitioner." (Rec. 3). Accordingly, the Agency has recommended various effluent limits which it believes are more appropriate. The Agency has received no objections from members of the public to the Petitioner's provisional variance request and believes that a provisional variance is warranted.

The Agency has concluded that, due to the severe damage to the Chicago Refinery by an explosion and fire on July 23, 1984, compliance on a short-term basis with effluent limitations in 35 Ill. Adm. Code 304.120, 304.124, 304.125, and 304.141(a) would impose an arbitrary or unreasonable hardship upon the Petitioner. The Agency believes that any adverse environmental impact on the Chicago S & S Canal should be minimized by the expeditious repair of the Petitioner's WWTP and associated facilities. It, therefore, recommends that the Board grant Union Oil Company of California a provisional variance from Sections 304.120, 304.124, 304.125 and 304.141(a) for a period of 45 days to allow it to bypass its wastewater treatment plant and discharge water into the Chicago Sanitary and Ship Canal until repairs are completed and normal operation of its WWTP can be resumed, subject to certain conditions.

Pursuant to Section 35(b) of the Illinois Environmental Protection Act, the Board hereby grants the provisional variance as recommended.

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

#### ORDER

Union Oil Company of California is hereby granted a provisional variance from 35 Ill. Adm. Code 304.120, 304.124,

304.125, and 304.141(a) to allow it to bypass its wastewater treatment plant at the Chicago Refinery near Lemont, Illinois and discharge water into the Chicago Sanitary and Ship Canal until repairs are completed and normal operation of its wastewater treatment plant can be resumed, subject to the following conditions:

1. The period of the variance shall extend for a period of 45 days, or until the treatment plant is operational, whichever is less.
2. The existing facilities shall be operated as efficiently as possible and shall include the use of as many units as possible to minimize the impacts of the discharge.
3. The treatment plant shall be returned to service as quickly as possible.
4. At all times during the period of the variance the outfalls shall be limited as follows:

Outfall 001

pH	5-13	Standard Units <sup>1</sup>
TSS	30	mg/1
COD	750	mg/1
BOD	115	mg/1
Chromium		
Total	5.0	mg/1
Oil, Fats & Grease	26.0	mg/1
NH <sub>3</sub> -N	20.0	mg/1
Phenol	14.0	mg/1
Cyanide	0.080	mg/1
Sulfide	5.5	mg/1

<sup>1</sup>The period of variance for pH only shall be 2 weeks from the date of the Order to allow the Petitioner adequate time to complete the mixing of its storm water basin contents.

Outfall 002

There shall be no discharge from outfall 002 during the period of the variance.

5. The Petitioner shall sample the discharge from Outfall 001 with a composite sample collected each day that there is a discharge.
6. Until the end of the variance period, the Petitioner shall report to the Agency every fourteen (14) days on the progress made in repairing the plant. These reports may be made by telephone to Mr. Theodore Denning at 312/345-9780.

- 7. Within ten (10) days after the end of the variance period, the Petitioner shall submit a written report to the Agency of the activities completed during the variance period. The Petitioner shall also submit its laboratory test results for the samples taken.
- 8. Within 10 days of the date of the Board's Order, Union Oil Company of California shall execute a Certificate of Acceptance and Agreement to be bound to all terms and conditions of this provisional variance which shall be sent to: Mr. James Frost, Illinois Environmental Protection Agency, Division of Water Pollution Control, Compliance Assurance Section, 2200 Churchill Road, Springfield, Illinois 62706. This certification shall have the following form:

CERTIFICATION

I, (We) \_\_\_\_\_, having read the Order of the Illinois Pollution Control Board in PCB 84-129 dated August 22, 1984, understand and accept said Order, realizing that such acceptance renders all terms and conditions thereto binding and enforceable.

\_\_\_\_\_  
Petitioner

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

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

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 22<sup>nd</sup> day of August, 1984 by a vote of 6-0.

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