

ILLINOIS POLLUTION CONTROL BOARD  
May 22, 1975

SHELL OIL COMPANY, )  
 )  
 Petitioner, )  
 )  
 v. ) PCB 75-90  
 )  
 )  
 ENVIRONMENTAL PROTECTION )  
 AGENCY, )  
 )  
 Respondent. )

William D. Maer, Attorney, appeared for the Petitioner;  
William A. Erdman, Attorney, appeared for the Respondent.

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

This Petition for Variance was filed by the Shell Oil Company (Shell) on February 24, 1975. The Petition seeks relief from the Particulate Standards of Rule 203(d)(1) of Chapter 2: Air Pollution, of the Pollution Control Board (Board) Regulations. PCB Regs., Ch. 2, Rule 203(d)(1). The Variance is sought for Shell's Wood River Refinery, for six months, from May 30, 1975, to November 30, 1975, pending the installation by Shell of particulate emission controls.

Shell's Wood River Refinery, located in Madison County, near the town of Roxana, Illinois, employs approximately 1,800 individuals, and is capable of processing approximately 290,000 barrels of crude oil per day (R.45). Of the crude oil processed, about 30% is converted into a "heavy oil", which is not marketable (R.42). This heavy oil cannot be processed in the regular refinery units, but must instead be processed through catalytic cracker units, which are used to process the heavy oil into useful products such as gasoline, home heating oil and propane, and also into feedstocks which can be further processed in the other units at the refinery (R.7,42). The catalytic cracker operates by contacting the heavy oil with catalyst, a finely divided material similar to powdered sugar in consistency, at a high temperature. During operation of the catalytic cracker, coke is deposited on the catalyst. It is then necessary to remove the coke from the catalyst in order to render the catalyst useable for further cracking operations.

The coke is removed from the catalyst in a "catalytic regenerator", where the coke is burned by a controlled combustion to remove it (r.8). That controlled combustion requires air, which must subsequently be removed (along with its component nitrogen) from the catalyst by the use of cyclones. The cyclones, however, are not entirely efficient, and do not remove all of the catalyst entrained in the combustion vapors (R.8). Two such catalytic regenerators with their attendant cyclones are the subject of this Variance Petition.

Shell's Petition (at page 2) states that typical catalyst losses to the atmosphere for its catalytic cracker Unit No. 1 are approximately 268 lbs./hr.; the losses for Unit No. 2 are estimated at 177 lbs./hr. Shell estimates that to achieve compliance with the Particulate Limitations of Rule 203(d)(1) it must achieve an emission rate of 79 lbs/hr. from each unit. (The Agency calculation for this figure is 80 lbs./hr.; since Shell is attempting to achieve a lower emission figure, we see no reason to question its computation.)

Under Rule 203(i)(5), Shell's Wood River facility is subject to limitations of Rule 2-2.51 of the Old Rules and Regulations Governing the Control of Air Pollution, promulgated by the predecessor of this Board. The stricter limitations of Rule 203(d)(1) will become effective as against the Wood River Facility after May 30, 1975.

This Board initially noted the particulate problems which exist with respect to catalytic regenerators when adopting Rule 203(d)(1). In the Matter of Emission Standards, R71-73, 4 PCB 298, 314 (1972). The Board there noted that these units have "enormous process weights" and set up special regulations to achieve the "high degree of control required" (id.). (The Board also noted that such a high degree of control is justified by virtue of the value of the recovered catalyst, as well as by the considerable quantities of particulate matter emitted.) The Board noted in that Opinion that even at that early date, "the more stringent requirement was already met by several Illinois installations employing electrostatic precipitators..." (id.).

Shell first reached a decision to use electrostatic precipitators on both catalytic regenerators at the Wood River Facility in mid 1973. At that time, Shell expected to have these precipitators in operation by April, 1975, allowing ample start-up time before the May 30, 1975 compliance date for Rule 203(d)(1). This Variance is now sought by Shell due to alleged delays in the construction of its electrostatic precipitators, which will prevent compliance with Rule 203(d)(1) until November, 1975.

The majority of the testimony introduced by Shell at the hearing held April 10, 1975 related to problems which Shell claims it has encountered in the construction of its electrostatic precipitators. Similarly, allegations of difficulties encountered in construction form the bulk of the Petition itself. Shell presented evidence and testimony indicating serious difficulties in obtaining the necessary steel to erect the planned electrostatic precipitators; further delays have resulted from weather and labor difficulties. The problems are further compounded by the lack of adequate working space at the Wood River Refinery (Pet.Ex. 4,5 are photographs demonstrating the cramped quarters in which the construction is taking place). Shell also introduced considerable testimony indicating that these delays were the result of factors beyond its control. The Environmental Protection Agency (Agency), in its Recommendation filed April 14, 1975, agrees that "most of the delay in installing the precipitators seems to be due to circumstances beyond Shell's control."

Testimony was also introduced as to the hardship which would be imposed should the Board fail to grant this variance (e.g. R.43,44). Storage facilities at the Wood River Facility are limited, and were the catalytic crackers forced to cease operation, it would soon be necessary to shut down the entire Wood River Refinery. There would simply be nowhere to store the heavy oil now processed by those units. Further, it is apparent that reduction or slow down of the operation of the catalytic crackers would not reduce emissions (R.42). It seems that operation of the catalytic converters, with their attendant particulate emissions, is essentially an all or nothing proposition.

As to the question of hardship, this Board may take notice--in light of the essential nature of the catalytic crackers for operation of the entire refinery--of facts relating to the economic benefits provided by the Wood River Facility. In light of the energy crisis, we note both the total quantity of petroleum refined at the Wood River Refinery, as described above, and that approximately 40-50% of Shell's gasoline production from the refinery is produced on the catalytic crackers, as well as a substantial quantity of home heating fuel and propane (R.42). The value of the 1800 jobs provided by this facility need not be commented on at length in light of current distressed economic conditions.

The Agency recommends that the Board grant this Variance. The Agency feels that Shell's compliance program with regard to Rule 203(d)(1) is a reasonable one, despite the November 30, 1975 target date. In addition, the Agency states that despite the refinery's location adjacent to residential areas, it has received no objection to the granting of this Variance. As will be discussed shortly, the Agency also notes that the Shell Refinery is located in a "highly industrialized area" (Rec.3).

The Board agrees that a Variance appears to be warranted

here. Shell has demonstrated considerable good faith in its attempts to achieve compliance with Rule 203(d)(1) by May 30, 1975. Nor does it appear that Shell was dilatory in filing the Petition in this matter; uncontroverted testimony indicates that it was not until February, 1975, that Shell realized it could not achieve compliance in time (R.31). Prior to that time, (and continuing now), Shell apparently mounted a maximum effort to achieve compliance. In excess of \$5 million has already been spent, and total cost is estimated to exceed \$5.5 million. In light of the site congestion discussed above, Shell has employed the maximum number of workers feasible in the erection process. Shell has paid premiums to its contractors to keep three crews working on the project, has paid premiums to the construction companies themselves, and has used its own influence to obtain scarce steel and materials for the contractors (E.g. R.11,12,35).

The only disputed matter at the hearing of April 10, 1975 was the matter of a performance bond. The Agency suggested that the Board require a \$100,000 performance bond; Shell claims that in light of its past efforts, such a bond should not be required. We are inclined to agree with the Petitioner. However, we also feel that in light of Section 36 of the Environmental Protection Act, and its clear directive from the General Assembly, some performance bond is warranted. Ill. Rev. Stat. Ch. 111 1/2, Sec. 1036 (1975). Weighing both the good faith demonstrated by Shell and the quantity of work remaining to be done, a performance bond of \$25,000 will serve to assure compliance with our Regulations.

Finally, we must discuss those factors mandated by the recent case of Train v. Natural Resources Defense Council, 43 U.S.L.W. 4467 (U.S. No. 73-1742, April 16, 1975). The Supreme Court there stated that no variance may be granted absent a showing that such a grant will not result in a violation of the national ambient air quality standards, or a failure to maintain those standards. Here, Petitioner has demonstrated the opposite; Shell introduced testimony and evidence which are uncontroverted, and which clearly indicate that a grant of this variance will not result in such a violation.

The following testimony of Richard Dreith, a Shell employee, adequately summarizes that testimony and evidence:

I will add this, I think it is a reasonable judgment then to state that the emissions from the current control devices of the catalytic crackers at the Wood River Refinery are not significantly affecting the meeting of primary air standards in the Alton-Wood River area, and any delay in the installation of the electrostatic precipitators would not affect the attainment of the primary air standards, since these standards have already been attained (R.13).

Petitioner's Exhibit 2, introduced at the April 10 hearing, shows particulate measurements taken in the general area of Wood River Refinery from 1967 until 1973. The 1973 figures, the most recent ones available at the time of hearing, indicate a violation of the 75 ug/m<sup>3</sup> primary standard for particulates at only one of three nearby stations. The maximum 24 hour average of 260 ug/m<sup>3</sup> was never approached.

The three monitoring stations for which Petitioner has submitted data lie in a line running approximately from northwest to southeast. The Alton station, (Alton 01), at 103 E. 3<sup>d</sup> St., is about 5 miles northwest of Wood River; the Edwardsville station, at 132 N. Kansas St., is about 10 miles southeasterly from Wood River; and the Wood River station, at 54 Walcott Avenue, is about 2-1/2 miles northwest of Petitioner's refinery.

The figures presented by Shell in its Exhibit 2 clearly indicate a "trend" in the Wood River area towards compliance with the primary standards for particulates. The figures presented clearly demonstrate a drastic and significant increase in the air quality for that area. One of the stations, (the only one for which figures were available during the entire 1967 -1973 period), showed that over a seven year period the annual geometric mean for particulate loading had declined from 100 ug/m<sup>3</sup> to 69 ug/m<sup>3</sup>. The other two stations for which 1973 figures were available demonstrate five year declines (1969 - 1973) of from 158 ug/m<sup>3</sup> to 79 ug/m<sup>3</sup>, and from 81 ug/m<sup>3</sup> to 54 ug/m<sup>3</sup>, respectively. Considering both the figures and the trend which they were stated to represent (R.13), we find the conclusion by Petitioner's witness that the area in question meets the health-related primary standard to be in accord with the weight of the evidence (R.13,14,17).

SUSPENDED PARTICULATE TRENDS IN THE ALTON-WOOD RIVER AREA  
FROM 1973 ILLINOIS AIR SAMPLING NETWORK REPORT  
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY <sup>1/</sup>

NATIONAL AIR STANDARDS FOR SUSPENDED PARTICULATES - ADOPTED 4/30/71

	<u>Primary Standard</u>	<u>Secondary Standard</u>
Annual Geometric Mean	75 $\mu\text{g}/\text{M}^3$	60 $\mu\text{g}/\text{M}^3$
Maximum 24-Hour Average	260 $\mu\text{g}/\text{M}^3$	150 $\mu\text{g}/\text{M}^3$

ALTON/WOOD RIVER TRENDS

Year	<u>Annual Geometric Mean - <math>\mu\text{g}/\text{M}^3</math></u>						
	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
<u>Sampling Station</u>							
Alton 01	100	93	106	86	80	88	69
Wood River 01	111	83	134	116	102	-	-
Wood River 03 <sup>2/</sup>	-	-	158	115	101	94	79
Wood River, Sewage Plant	-	106	-	-	-	-	-
Edwardsville	-	-	81	86	78	69	54

1973 SUSPENDED PARTICULATE

<u>Sampling Station</u>	<u><math>\mu\text{g}/\text{M}^3</math></u>		
	<u>Number of Samples</u>	<u>Maximum 24-Hr Average</u>	<u>Annual Geometric Mean</u>
Alton 01	46	146	69
Wood River 03 <sup>2/</sup>	57	153	79
Edwardsville	60	123	54
National Primary Standard	-	(260)	(75)

<sup>1/</sup> Most recent report

<sup>2/</sup> 54 Walcott Avenue

The validity of the trend alleged by Petitioner is borne out by figures which have only recently become available to the Board. An Agency report which includes data for 1974 indicates that the Wood River station, with a 1973 annual geometric mean of 79 ug/m<sup>3</sup>, has now achieved compliance with the national primary standard. Similarly, the other two monitoring stations show either improved or maintained air quality. Illinois Environmental Protection Agency, Division of Air Pollution Control, Annual Report To The Pollution Control Board, Part E, at 3,4 (1975).

The Board has previously noted the importance of meeting these federal primary standards, which it described as "essential for health reason". Although the Board has noted, in the Emission Standards Opinion cited above, the fact that there were problems with regard to particulates and the federal primary ambient air quality standard in the general Wood River area, 4 PCB 316, the figures noted there were for the year 1970, and were for areas in Granite City adjacent to steel mills. In view of the uncontroverted proof presented here, and the fact Granite City is approximately 25 miles south of Wood River, Petitioner's figures and conclusions are neither inherently impossible nor improbable. On the contrary, they are supported by competent testimony and evidence.

Our determination here as regards attainment of the ambient air quality standards is a specific one, limited to the contributions of the individual source in question for the area shown by the evidence to be that affected by the grant of the Variance. We do not decide that any entire region or area has achieved the ambient air quality standards for particulates, and therefore are (at least on that basis) eligible for variances under Train. The determination of the contribution of the emissions of an individual source to the achievement or failure to achieve an ambient air quality standard must be specific to that source. The area which will be effected by the grant of an individual variance must be decided by the Board on the facts before it; its determination must be on a case-by-case basis. It will suffice that in this instance Petitioner has met its burden.

Nor are we stating that a showing of compliance with the ambient air quality standards is the only relevant test in the grant of an air Variance. The Board has considered this question on previous occasions, and has specifically declined to reach such a conclusion:

To excuse compliance with emission standards whenever air-quality standards are met would be to abandon the emission standards altogether. Even in areas that are now cleaner than required by the air-quality standards...there is a need

for compliance with emission standards...  
"Illinois Power Co. (Wood River #5) v. EPA, PCB 72190, 6 PCB 17, 28 (1972)  
(The decision there, by Mr. Currie, related to sulfur dioxide.); see also, 4 PCB at 309 ("...air quality standards are set not at the optimum level of air quality, but at the worst level we are prepared to tolerate if we must.")

We merely decide that when such a showing has been made, it is within our power to grant such a Variance. The other relevant factors set out in the Act, our Rules, and our prior decisions must still be considered. Shell has also met that burden.

This Board has in the past stated that the burden of proof in Variance matters is on the Petitioner. Swords v. EPA, PCB 70-6, 1 PCB 5, 7 (1970) (This was the Board's first reported decision, where Mr. Lawton stated, "the evidence to justify the allowance must be substantial and convincing.") The courts have agreed that the burden is on the Petitioner seeking a variance. See, e.g., Shell Oil Co. v. PCB, 321 N.E.2d 170, 172 (1975); City of Mattoon, v. EPA, 296 N.E.2d 383, 387 (1973). We find here that this burden now applies to the showing required under the Train case, supra, and that Shell has met that burden.

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

#### ORDER

IT IS THE ORDER OF THE POLLUTION CONTROL BOARD that Petitioner Shell Oil Corporation be granted for its Wood River Refinery a Variance from the particulate standards of Rule 203(d)(1), for the period May 30, 1975 until November 30, 1975, subject to the following conditions:

(a) Shell Oil Company shall post a \$25,000 performance bond with the Illinois Environmental Protection Agency, in a form satisfactory to that Agency, to assure completion of the construction contemplated in the accompanying Opinion. Such bond shall be posted within 30 days of the date of this Order, at the following address:

Environmental Protection Agency  
Division of Air Pollution Control  
Control Program Coordinator  
2200 Churchill Road  
Springfield, Illinois 62706

(b) Petitioner shall submit written progress reports to the Agency, at the above address, detailing the progress made in the construction contemplated in the accompanying Opinion; such reports shall each cover a two month period, and shall be submitted within two weeks of the close of such periods, which are April-May, June-July, August-September, and October-November, 1975.

(c) Within 30 days of the date of the adoption of this Order Petitioner Shell Oil Corporation shall complete and submit to the Environmental Protection Agency, at the above address, the following certification:

CERTIFICATION

I (We), \_\_\_\_\_, have read, and fully understand the Order of the Illinois Pollution Control Board in PCB 75-90, Shell Oil Co., Wood River Refinery v. EPA. I (We) hereby accept the Variance granted by said Order, understanding that all conditions thereto shall be binding and enforceable.

Signed: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Mr. Dumelle dissents.

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board Hereby certify that the above Opinion and Order of the Board were adopted on the 22<sup>nd</sup> day of May, 1975 by a vote of 4 to 1.

  
\_\_\_\_\_  
Christan L. Moffett, Clerk  
Illinois Pollution Control Board