

ILLINOIS POLLUTION CONTROL BOARD
September 29, 1977

IN THE MATTER OF:)
)
PARTICULATE EMISSIONS) R76-5
FROM AIR FURNACES)

OPINION OF THE BOARD (by Mr. Goodman):*

The Proposal for Regulatory Amendment in this matter was filed by Deere & Company (Deere) on February 20, 1976, accompanied by the signatures of more than 200 citizens requesting its consideration and adoption. Ill. Rev. Stat., Ch. 111-1/2, §1028 (1977); Ill. PCB Regs., Ch. 1, §204(a) (1977). The Board authorized hearings on Deere & Company's Proposal at its regular meeting of February 26, 1976. In addition the Board Ordered publication of R76-5 in Environmental Register #120, published February 27, 1976. On July 12, 1977, the Board was notified by Deere & Company that Deere had sold the foundry formerly called the John Deere Vermilion Works to the Vermilion Iron Corporation. Inasmuch as the Proposed Regulatory Amendment in this matter concerns only the air furnaces located in Hoopeston, Illinois, the Board hereby accepts the Vermilion Iron Corporation as Alternate Petitioner in this matter. The Board considers this proposal to be site-specific. As such, only two hearings were held, one on the merits of the proposal in general and one on the economic impact study, both in Hoopeston.

At the first hearing on this proposal held in Hoopeston, Illinois on June 8, 1976, Petitioner proposed certain changes in the Amendment Petition. Because these changes resulted in a more restrictive standard, the Board did not provide for notice of the proposed changes and will hereinafter address itself to the proposal as presented at the June 8, 1976 hearing.

The Petitioner herein proposes to amend Rule 203(d) of Chapter 2, Air Pollution Control Regulations, by adding a new Part 9. Part

*The Board wishes to thank Roberta Levinson-Sirota, Attorney, Hearing Officer in this matter, for her assistance in the preparation and drafting of this Opinion.

(d) of Rule 203 lists exceptions to Rule 203(a), 203(b) and 203(c), Particulate Emission Standards and Limitations. Petitioner asks that Rule 203(d) be amended as follows:

(9) Certain Small Iron-Melting Air Furnaces. Rules 203(a), 203(b) and 203(c) shall not apply to iron-melting air furnaces if all the following conditions are met:

- (A) The air furnace was in existence prior to April 15, 1967; and,
- (B) The air furnace process weight rate is less than or equal to 5,000 lb/hr; and,
- (C) The air furnace as of _____ (the effective date of this subparagraph), either:
 - (i) is in compliance with the following Table 2.2.1; or
 - (ii) is in compliance with the terms and conditions of a variance granted by the Pollution Control Board, and construction has commenced on equipment or modifications sufficient to achieve compliance with Table 2.3.1.

Table 2.3.1

Allowable Emissions From Small Iron-Melting

Air Furnaces Covered by Rule 203(d) (9).

<u>Process Weight Rate Pounds Per Hour</u>	<u>Allowable Average Emission Rate Pounds Per Hour</u>
1,000	6.10
2,000	9.40
3,000	12.70
4,000	16.00
5,000	19.16

The average emission rate is computed by dividing the sum of the emissions during operation by the number of hours of operation, excluding any time during which the equipment is idle.

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For process weight rates listed in Table 2.3.1, straight line interpolation between two consecutive process weight rates shall be used to determine allowable average emission rates.

The subject of this Petition is the melting facility of the malleable iron foundry located in Hoopston, Illinois, known as the Vermilion Iron Corporation. This facility consists of two air furnaces used for melting in the production of malleable iron castings, with current practice dictating the use of each furnace on alternate weeks. Due to the unique operational characteristics of air furnaces, there is grave doubt as to the ability to control the emissions to meet Rule 203 and at the same time maintain the metallurgical requirements of the melting process. Although used extensively to produce malleable iron in the past, an air furnace today is a relatively rare hot metal producing piece of equipment. As such, there is very little abatement technology which can be directly applied to the air furnace's rather unusual operating characteristics. Unfortunately the metallurgical control of an air furnace is dependent upon control of the air flow within the furnace, which makes a direct connection to the normal furnace abatement equipment very difficult (R.105).

The particulate emissions from the air furnace melting facilities located in Hoopston, Illinois have been the subject of a number of variance petitions filed before the Board, starting in 1973. Pursuant to Board Orders in PCB 73-88 and PCB 74-119, granting variance from Rule 203, Deere & Company spent substantial sums for conversion from coal to oil-firing, installation of afterburners, experimentation with various baffles, and experimentation with firing rates of the air furnaces in an effort to comply with the Regulations. As a result of the Board Order in the third variance proceeding, PCB 74-469, additional substantial sums were spent upon a Research and Development Program conducted by A.T. Kearney, Incorporated. A fourth variance proceeding, PCB 75-506, is now pending before the Board.

Exhibit 8 contains the A.T. Kearney, Incorporated, Air Furnace Emission Control Research and Development Program final report. The report concludes that particulate emission rates in excess of the levels allowed under Rule 203(a) are the result of variations in certain parameters that cannot be readily controlled or predicted. These parameters include charge composition, heat size, melting cycle time, firing rate, and alloy and other additions. Kearney investigated possible changes in furnace design and operation to determine

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their effect on the rate of emissions produced during melting. It is the company's belief that none of the possible changes would have sufficient effect in lowering the emission rates so as to meet the requirements of Rule 203(a). The report further concludes that a dry centrifugal collector would result in collection of a sufficient percentage of the particulate emissions to reduce the level to an acceptable amount but would have an estimated cost of \$159,000. In addition, it is estimated that the centrifugal collector would increase the cost of producing castings by an amount estimated to be \$58.00 per ton, a very significant increase in total cost of production. The cost of installing alternative melting equipment such as induction or electric arc furnaces was found to be too high to justify at the present level of production. In conclusion the report suggests that, because achieving compliance with Rule 203(a) would require the expenditure of a very large sum of money to collect about 50 pounds of particulate emissions per day and because the use of an air furnace in an iron foundry is very rare and is not governed by the same considerations governing other sources, this operation should be regulated under an appropriate average daily emission level rather than under the hourly peak requirements imposed by Rule 203(a).

In response to a Board Order in PCB 74-469, Deere submitted evidence indicating compliance of the Hoopeston area with the national ambient air quality standards. In the absence of monitoring data for Hoopeston, Deere's approach was accepted by the Board as a sufficient showing in that case. Although Deere's method of determination of the ambient air quality in PCB 74-469 was crude and inconclusive, the rural nature of the Hoopeston area and the results from the nearest monitors indicate that there is not a significant air quality problem (Ex. 6). Since there does not appear to be other air furnace iron melting equipment in the State of Illinois and since this Regulation will be confined to the Hoopeston area in any event, the Board finds that promulgation of the proposed regulation would have no significant environmental effect on the State (R.184). That the citizens in the Hoopeston area support the continued operation of the foundry is sufficiently established by the record in PCB 74-469, wherein a Petition signed by over 3,000 persons and some 350 letters from residents of Hoopeston were received by the Board. Although the Agency attended both hearings herein and cross-examined Petitioner's witnesses, there has been no challenge by the Agency to the evidence presented by Petitioner in this proceeding.

On July 26, 1977 the second hearing in this proceeding was held to consider the Economic Impact Study of the Proposal and to receive testimony by Mr. Ronald Sutherland, the author of the Study. The

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Economic Impact Study concludes that closing the foundry would entail an economic cost of some \$13,000,000 due to unemployment, foregoing purchase of raw materials, and reduced property sales and income taxes. The cost of installing and operating the most feasible pollution control device was estimated at \$225,000. The benefits of improved ambient air quality due either to shutting down the foundry or to using pollution control equipment was estimated at between \$64,000 and \$83,000. In the case of the air pollution control equipment, the presumption was made that compliance could be achieved without destroying the air furnace's capability to produce a usable product.

The opinion of the Economic Technical Advisory Committee (ETAC) of the Illinois Institute for Environmental Quality suggests the estimation of benefits are highly uncertain due to the relatively sparse information available as to particulate concentration in the area. ETAC estimated that the dollar benefit estimate might go as high as \$1,200,000, depending upon the actual Hoopston area particulate concentration. The Board agrees with ETAC's evaluation of the situation but, after consideration of the evidence presented in this proceeding, finds that the probability of anything near the higher benefit figure is extremely small.

The Board finds that the Amended Regulation as proposed in this proceeding should be adopted with minor changes. The Board's decision is based upon the following factors:

1. The apparent lack of harm to the environment which would result from the proposed Regulation.
2. The relatively high cost of compliance should the Proposal not be adopted.
3. The distinct possibility that the air furnaces would not remain viable producers of a useful product should control of the particulate emissions be attempted.
4. The very narrowly defined limits of both the emissions and the geographical area under the proposed regulation.
5. The demonstrated support of the Proposal by residents in the area and the Illinois Environmental Protection Agency.

The Board therefore adopts as its Proposed Final Draft in this matter the Proposal as presented by Petitioner in Exhibit 2, with minor changes. The Board orders publication of its Proposed Final Draft in the Environmental Register. A public comment period shall be allowed for 30 days from the date of its adoption.

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

I, Christan L. Moffett, Clerk of the Illinois Pollution Control Board, hereby certify the above Opinion was adopted on the 29th day of September, 1977 by a vote of 4 0.



Christan L. Moffett, Clerk
Illinois Pollution Control Board