

ILLINOIS POLLUTION CONTROL BOARD  
June 4, 1992

IN THE MATTER OF: )  
 )  
GENERAL MOTORS CORPORATION ) R90-23  
SITE-SPECIFIC EXCEPTION TO ) (Rulemaking)  
35 ILL. ADM. CODE 216.381 )  
FOR FERROUS FOUNDRIES IN )  
VERMILION COUNTY. )

Proposed Rule.                      First Notice.

OPINION AND ORDER OF THE BOARD (by B. Forcade):

This matter comes before the Board on the October 10, 1990, proposal of General Motors Corporation (GM) for site-specific relief from Section 216.381 (35 Ill. Adm. Code 216.381) and GM's amended petition filed on December 21, 1990. Section 216.381 limits the emission of gases containing carbon monoxide from cupolas to a concentration of carbon monoxide of 200 ppm. The petition seeks exception to this limit for foundries located in Vermilion County and imposes a limit of 2,000 ppm for carbon monoxide emissions from cupolas in Vermilion County.

In a March 14, 1991, order, the Board determined that an Economic Impact Statement was not required. Hearings were held on August 27, 1991 in Chicago, Illinois and on August 29, 1991 in Danville, Illinois. The Illinois Environmental Protection Agency (Agency) and the Department of Energy and Natural Resources (DENR) participated in the hearings. Several members of the public also attended the hearings. GM filed a memorandum in support of the petition on October 30, 1991, along with the engineering studies and stack test reports requested at the hearing.

Public comments were received from DENR and the Agency. In P.C. #1, DENR provided the Board with a list of foundries in Illinois. The Agency, in P.C. #2, supported the proposed rule.

BACKGROUND

JM operates an iron foundry in Danville, Vermilion County, Illinois, manufacturing iron castings for the automotive industry. These include brake drums, bearing caps, differential carriers, water pumps and brake rotors. The foundry is located approximately 1.5 miles from downtown Danville, in an area that is predominately agricultural, with some residential sections.

(Tr.A<sup>1</sup> at 12.) Vermilion County has been designated by U.S. EPA as either an attainment area or "unclassified" for carbon monoxide. See 40.CFR 81.314 (1990). (Tr.B at 15.)

General Motors contributed more than \$80.7 million to the Danville-area economy in 1990. (Tr.A at 15.) In 1990, the average number of employees on GM's payroll at Danville was 1323. (Tr.A at 15.) The foundry produces more than 800 tons per day of iron castings. (Tr.A at 23.) Divisions of GM account for 90% of the sales while the rest is sold to other automotive manufacturers such as Ford and Chrysler. (Tr.A at 26.) The castings are also exported to France, Canada and Mexico. (Tr.A at 26.)

GM presently is using two cupolas (Cupola #2 and #3) in its foundry operation. (Tr.A at 58.) Cupola #2 typically melts approximately 30 to 54 tons per hour; cupola #3 melts from 66 to 72 tons per hour. (Tr.A at 59.) A cupola is a vertical shaft furnace which is fed or "charged" with layers of metallics, coke and limestone (as flux). (Tr.A at 61.) The shaft is 120 feet tall and up to 132 inches in diameter. (Tr.A at 61.) Cupola melting is used by GM to melt scrap metal. More than 200,000 tons of scrap metal are remelted and made into castings at the Danville facility each year. (Tr.A at 60.)

Typical cupola exhaust gasses can contain 13 to 27 percent carbon monoxide. (Tr.A at 108.) This is the equivalent of 130,000 to 270,000 ppm. (Tr.A at 108.) In a cupola, high carbon monoxide levels and specific carbon dioxide ratios are important to the metallurgical properties of the iron. (Tr.A at 109.) These levels can be minimized by proper selection of fuels, charge material and by major facility changes but cannot be eliminated. (Tr.A at 109.)

In July of 1988, emissions tests of the cupolas showed carbon monoxide emissions from both cupolas were in excess of 200 ppm. Carbon monoxide was present at a concentration of 8,317 ppm for Cupola #3 and 4,563 ppm for Cupola #2. (Exh. C-18, Tr.B at 81.) Subsequent tests showed carbon monoxide concentrations as high as 16,053 ppm for Cupola #3. (Exh. C-18, Tr.B at 81.) As a result of these tests, GM initiated an aggressive plan to modify the system beyond the state-of-the art contemplated by the regulations. In November 1988, GM filed a petition for variance (PCB 88-193) in order to continue the operation of the foundry while it implemented corrective action to reduce the concentration of carbon monoxide in its emissions. (Tr.B at 23.)

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<sup>1</sup> Tr.A refers to the transcript of the August 27, 1991, hearing. Tr.B refers to the transcript of the August 29, 1991, hearing.

As part of the variance petition, GM submitted a compliance plan describing various activities to bring the emissions within compliance. (Tr.B at 23.) In June of 1989, GM filed an amended petition to provide a more recent, and thorough, compliance plan. GM has completed the compliance plan submitted with the original and amended petitions. (Tr.B at 24.) While these modifications have significantly reduced emissions, compliance has not been achieved. Emissions have dropped from a high of approximately 18,000 ppm to below 2,000 ppm. (Tr.B at 40.)

A consultant to GM suggested two additional modifications that could be made to the cupola operation to reduce emissions. The first suggestion was to pull more air through the system and the second was to replace both cupolas and the fume control systems. The estimated cost of these modifications were \$8.2 million and \$52 million. (Tr.B at 42.) The consultant could not guarantee that these modifications would result in compliance with the 200 ppm carbon monoxide standard. (Tr.B at 40.)

GM does not consider these alternatives economically feasible and believes that a rule change is the best alternative to achieve compliance.

#### ENVIRONMENTAL IMPACT

A computer modeling study demonstrated that carbon monoxide emissions at the rate of 2,000 ppm would not cause an adverse environmental impact in the area. (Exh. D-1, Tr.B at 116 -167.) Vermilion County is either an attainment area or unclassified for carbon monoxide. The present emissions from the Danville facility are less than 2,000 ppm. The purpose of the site specific rulemaking is to allow the same level of carbon monoxide emissions that exists today. (Am. Pet. at 5.)

#### AFFECTED SOURCES

GM does not believe that there are any similar sites in the state and is certain there are no similar sites located in Vermilion County. In public comment #1, DENR provided a list of foundries in Illinois classified as Gray and Ductile Iron Foundry, the same classification as the GM foundry in Danville. DENR provided this list to the Board for the purpose of informing the Board of similar facilities in the state which may seek similar regulatory relief. There are 50 foundries in Illinois with this classification. However, a similar classification does not necessarily mean that these facilities are operating under similar conditions as GM or are unable to comply with the 200 ppm standard.

The site-specific rule as proposed by GM would exempt all foundries in Vermilion County from the 200 ppm standard for carbon monoxide emissions and permit emissions of 2,000 ppm. The list of foundries provided in P.C. #1 lists one other foundry in Vermilion County, with the same classification as GM. The S. T. Gallagher & Son Inc. foundry is located in Hoopeston, Illinois in Vermilion County. No additional information was provided concerning this foundry or the emission of carbon monoxide from the facility. Therefore, the proposed rule will be modified so that the site-specific relief is limited to GM's facility in Danville.

#### TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

In the Board's 1972, opinion adopting the carbon monoxide emission standards, the Board noted that the 200 ppm standard could be met with the use of inexpensive afterburners. (Tr. B at 71, Exh. C-14.) See In the Matter of: Emission Standards (April 13, 1972), R71-23, 4 PCB 298. The costs of such afterburners for a typical-size cupola, 54-inch inside diameter, amounted to \$2,400 in 1968. (Tr.B at 71, Exh. C-15.) The GM plant in Danville has had the type of technology contemplated by the regulation in place for more than 20 years. (Tr.B at 79.) Even with subsequent modifications, this technology fails to achieve compliance. GM has employed technologies beyond those contemplated by the original 1972 regulation, without achieving compliance. The emission controls at the Danville plant remove between 99.1 and 99.6 percent of the CO in the exhaust gases. (Tr.B at 119.) Other available technologies would require extensive structural modifications which are too costly for the plant in light of other environmental considerations. Modern Equipment, a consultant to GM, indicated that no foundry was achieving carbon monoxide emission levels consistently below the 200 ppm standard. (Tr.B at 24.)

The technology presently installed at the GM plant in Danville has reduced the emission of carbon monoxide to less than 2,000 ppm. With the present technology, GM will be in compliance with the proposed rule.

#### CONCLUSION

The Board agrees that site-specific relief is appropriate, based on the record of this proceeding. GM has attempted to achieve compliance by modifying its system and studying technologies to reduce the carbon monoxide emissions. While, GM's efforts have substantially reduced the carbon monoxide emissions, it is not in compliance with the regulation. Additional modifications to the cupolas are prohibited by cost and will not guarantee compliance. The proposed rule will not

allow an increase in carbon monoxide emissions from its present level. Studies done by GM show that carbon monoxide emissions of 2,000 ppm will not have an adverse impact on the environment in Vermilion County. The rule the Board today proposes for first notice is the rule proposed by GM in its petition, modified to limit the site-specific relief to GM's foundry in Vermilion County.

ORDER

The Board hereby directs that first notice of the following proposed amendments be submitted to the Joint Committee on Administrative Rules.

SUBPART O: PRIMARY AND FABRICATED METAL PRODUCTS

Section 216.381 Cupolas

No person shall cause or allow the emission of gases containing carbon monoxide into the atmosphere from any cupola with a manufacturer's rated melt rate in excess of 5 tons per hour, unless such gases are burned in a direct flame afterburner so that the resulting concentration of carbon monoxide in such gases is less than or equal to 200 ppm corrected to 50 percent excess air or such gas streams are controlled by other equivalent pollution control equipment approved by the Agency according to the provisions of 35 Ill. Adm. Code 201.

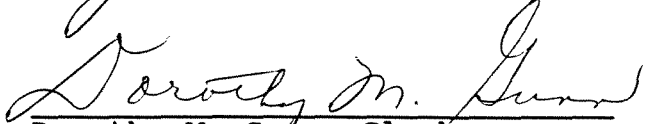
Section 216.382                    Exception, General Motor's Ferrous Foundry in Vermilion County

The standard for carbon monoxide of Section 216.381 does not apply to the existing ferrous foundry located adjacent to Interstate 74 at G Street in Vermilion County, owned by General Motors Corporation on the effective date of this regulation. The emission of carbon monoxide from this foundry shall not exceed 2,000 ppm corrected to 50 percent excess air.

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

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 4<sup>th</sup> day of June, 1992, by a vote of 7-0.



Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board