ILLINOIS POLLUTION CONTROL BOARD
September 1, 1994

IN THE MATTER OF:	)	
	)	
PETITION OF ALUMAX INC.	)	AS 92-13
FOR AN ADJUSTED STANDARD	)	(Adjusted Standard)
FROM 35 ILL. ADM. CODE	)	
PART 218	)	

KATHERINE D. HODGE OF HODGE AND DWYER APPEARED ON BEHALF OF PETITIONER, ALUMAX INC.;

SHEILA G. KOLBE APPEARED ON BEHALF OF PETITIONER, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY.

OPINION AND ORDER OF THE BOARD (by M. McFawn):

This matter is before the Board on a joint petition for adjusted standard filed by Alumax Inc. (Alumax) and the Illinois Environmental Protection Agency (Agency) on December 20, 1993. The petitioners request that Alumax be given an adjusted standard from the air emission control requirements of 35 Ill. Adm. Code Part 218 Subpart TT for its aluminum sheet manufacturing facility located in Morris, Illinois.

The Board's responsibility in this matter arises from the Environmental Protection Act (Act) (415 ILCS 5/1 et seq.). The Board is charged therein to "determine, define and implement the environmental control standards applicable in the State of Illinois" (Section 5(b) of the Act) and to "grant . . . an adjusted standard for persons who can justify such an adjustment" (Section 28.1(a) of the Act). Thus, the Board is charged with the rulemaking functions under the Act, including the authority to grant individual adjusted standards which are different from the Board's generally applicable regulations. Although usually granted as permanent relief, the adjusted standard is not adopted as a rule. Rather, the opinion and order granting, and oftentimes conditioning, the relief requested serves as the regulatory and enforcement vehicle.

Based upon the record before it and upon review of the factors involved in the consideration of adjusted standards, the Board finds that petitioners have demonstrated that grant of the adjusted standard sought is warranted. The adjusted standard accordingly is granted.

ADJUSTED STANDARD PROCEDURE

Section 28.1 of the Act provides that a petitioner may request, and the Board may adopt, an environmental standard that is: (a) applicable solely to the petitioner, and (b) different

from the standard that would otherwise apply to petitioner pursuant to a rule of general applicability. Such a standard is called an adjusted standard. The general procedures that govern an adjusted standard proceeding are found at Section 28.1 of the Act and within the Board's procedural rules at 35 Ill. Adm. Code Part 106.

Where, as here, the regulation of general applicability does not specify a level of justification required for a petitioner to qualify for an adjusted standard, the Act at Section 28.1(c) specifies four demonstrations that must be made by a successful petitioner:

1) Factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;

2) The existence of those factors justifies an adjusted standard;

3) The requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and

4) The adjusted standard is consistent with any applicable federal law.

(415 ILCS 5/28.1(c).)

PROCEDURAL HISTORY

Alumax originally filed a petition for adjusted standard on November 25, 1992. On January 7, 1993, the Board issued an order finding this petition deficient, and directing Alumax to submit an amended petition by March 8, 1993. On March 6, 1993, Alumax submitted an amended petition. By order dated March 25, 1993, the Board found the amended petition to be deficient as well, and ordered Alumax to submit an additional amended petition by April 16, 1993. On April 5, 1993, Alumax filed a motion requesting an extension of time to file a second amended petition, and the Board granted a 30-day extension until May 16, 1993. Subsequently, Alumax requested 3 additional extensions while engaged in negotiations with the Agency, which the Board granted.

During that time, Alumax requested the Agency to join as co-petitioner in this adjusted standard proceeding, and the Agency agreed. On December 13, 1993, Alumax and the Agency jointly requested a 21-day extension until January 3, 1994 to file a joint petition, which the Board granted by order dated December

16, 1993. Alumax and the Agency submitted a joint petition for adjusted standard on December 20, 1993. Petitioners included proposed language for the adjusted standard as Exhibit 8.

Hearing was held in this matter on March 1, 1994 in Morris, Illinois, before hearing officer Deborah Frank. At hearing, Mr. Walter J. Hawkins and Mr. Michael P. MacDonald testified on behalf of Alumax, and Mr. Chris Romaine testified on behalf of the Agency. No members of the public attended. On May 31, 1994, the parties jointly filed a motion to correct the transcript, which is hereby granted. Simultaneously, the parties filed amended proposed language for a Board order granting the adjusted standard, which replaced the language previously submitted as Exhibit 8.

RULE OF GENERAL APPLICABILITY

Petitioners seek an adjusted standard from the air emission control requirements of 35 Ill. Adm. Code Part 218. These regulations became applicable to the Alumax facility as a result of the Board's adoption of amendments to the reasonably available control technology (RACT) rules in R91-28. These amendments expanded the Chicago ozone non-attainment area to include Goose Lake and Aux Sable Townships in Grundy County and Oswego Township in Kendall County. These regulations became effective November 15, 1992, and affected stationary sources of VOM emissions in these townships, including the Alumax facility, were required to demonstrate compliance by November 15, 1993. RACT is defined as "the lowest emission limitation that an emission unit is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." (35 Ill. Adm. Code 211.5370.)

Alumax is subject to the requirements in Subpart TT of the RACT rules, entitled "Other Emission Units." Pursuant to Section 218.980(b)(1), the applicability threshold for Subpart TT is potential to emit 25 tons per year. The applicable emission control requirements are set forth in Section 218.986, which states in pertinent part:

> Every owner or operator of an emission unit subject to this Subpart shall comply with the requirements of subsection (a), (b), (c), (d), or (e) below.
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> (a) Emission capture and control equipment which achieve an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit, or
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> ******
>
> (c) An alternative control plan which has been approved by the Agency and the USEPA in a federally enforceable

permit or as a SIP revision.

Alumax thus seeks an exception from the requirement that it reduce its VOM emissions by 81 percent.

Additionally, Alumax's facility is subject to Section 218.108, which states in relevant part:

> (a) Notwithstanding the provisions of any other Sections of this Part, any exemptions, variations or alternatives to the control requirements, emission limitations, or test methods set forth in this Part shall be effective only when approved by the Agency and approved by the USEPA as a SIP revision.

Alumax does not believe that it needs to obtain relief from Section 218.108. Based on language in the Board's second notice opinion in R93-14, entitled "In the Matter of Reasonably Available Control Technology for Major Sources Emitting Volatile Organic Materials in the Chicago Ozone Nonattainment Area: 25 Tons" (November 18, 1993), Alumax believes that, while it will ultimately be necessary to obtain USEPA's approval of the adjusted standard from Section 218.986 as a State Implementation Plan (SIP) revision, the adjusted standard will be effective at the state level immediately upon granting by the Board.

In our second notice opinion in R93-14, the Board affirmed the Agency in interpreting Section 218.108 as follows:

> Section 218.108 is intended to assure the regulated community and to inform USEPA and the public that variations from adopted rules are available from [the Board], while assuring USEPA that such an action by the state will not unilaterally alter the SIP approved by USEPA. The Agency states that subsection (a) of Section 218.108 simply reiterates the Board's grant of an adjusted standard, site specific rule, or variance does not protect a source from federal enforcement until that relief . . . is approved by the USEPA as a SIP revision . . . . In sum the Agency states that Section 218.108 reiterates relief already available to sources and applies generally to the rules, and thus has no particular relationship to any particular subpart.
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> (Id. at 5-6.)

The Board agrees with Alumax that it is not necessary for Alumax to receive an adjusted standard from 218.108(a) for the adjusted standard from Section 218.986 to become effective on the state level. The adjusted standard from Section 218.986 will be effective immediately when granted by the Board. Ultimately, it will have to be approved by the USEPA as a SIP revision.

BACKGROUND

Alumax operates an aluminum sheet manufacturing facility in Morris, Aux Sable Township, Illinois which produces a wide variety of coiled and flat aluminum sheet. The facility has been in operation since 1968 and employs approximately 350 people. (Am. Pet. at 7.)[1]

The plant's manufacturing process includes a hot rolling mill and two cold rolling mills. The hot rolling mill is used to reduce 22-inch thick cast ingots to aluminum sheet between two tenths of an inch thick and a quarter inch thick. A cold rolling mill is then used to further reduce the thickness of the aluminum sheet as necessary to meet customer needs and to produce superior finished surfaces. (Am. Pet. at 7.)

During both the hot and cold rolling processes, the aluminum sheet is sprayed with rolling lubricant, which cools and lubricates the metal during the rolling operations. In both processes, the lubricant is sprayed on in large volumes, and the excess is collected in a sump and recirculated. (Id.) The rolling lubricants are a source of VOM emissions for both the hot and cold rolling processes. (Exh. 1 at 8; Exh. 2 at 7.)

The lubricant used in the hot rolling process consists of an oil in water emulsion, typically maintained at 6 percent oil, but no more than 10 percent oil. (Exh. 1 at 6; Am. Pet. at 13.) This is the minimum practical amount of oil which can be used in the rolling mill fluid. It is necessary to use an oil in water emulsion for the hot rolling process since it is operated at approximately 1,000 degrees Fahrenheit, and the oil would burn if used by itself. Some of the water from the emulsion vaporizes upon contact with the surface of the aluminum, creating a "steam blanket" above it. The steam blanket is collected by the hood system as described below. (Exh. 1 at 6.) The hot mill lubricant reservoir is maintained at a maximum temperature of 150 degrees Fahrenheit in order to minimize VOM emissions through vaporization from the reservoir. (Exh. 1 at 6, 12.)

During the cold rolling process, which is performed at room temperature with metal temperatures below 265 degrees Fahrenheit (Exh. 2 at 2), the lubricant used is a highly paraffinic oil with additives. (Exh. 2 at 5; Am. Pet. at 8.) Additionally, during fifteen percent of the passes through the cold rolling mill, Stoddard Solvent, a highly paraffinic solvent, is applied to the aluminum to remove excess lubricant, in a process called solvent

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[1] The amended petition will be cited as "Am. Pet. at _", exhibits will be cited as "Exh. # at _", and the hearing transcript will be cited as "Tr. at _".

washing. (Tr. at 16; Am. Pet. at 8.) This is necessary to prevent staining during the annealing process, which follows the rolling process. The Stoddard Solvent is also a source of VOM emissions for the cold rolling process. The excess solvent is captured in the coolant sump and becomes an additive to the rolling lubricant. (Exh. 2 at 4; Tr. at 17.)

A hood system is employed at both the hot mill and cold mills, which collects the fumes generated. The collected fumes are treated with a Busch cyclonic unit that separates out and collects particulates and droplets of oil for reuse. (Exh. 1 at 8 and 13; Exh. 2 at 2 and 16.) The remainder, which has been vaporized, is vented to the atmosphere. The rolling operations thus result in emissions of volatile organic materials in vapor and aerosol forms.

Alumax performed emission testing at its facility from August 31 through September 2, 1993, the results of which were attached to the amended petition as Exhibit 3. Based on this testing, Alumax estimates that its actual VOM emissions are as follows:

1) for the hot rolling mill, the estimated emissions are approximately 6 tons per year (0.02 tons per day); and

2) for the cold rolling mills, the estimated emissions total approximately 88 tons per year (0.24 tons per day).

(Exh. 4; see calculations in Exh. 5.)

The facility's emissions, actual and potential, thus exceed 25 tons per year, the threshold for applicability of control requirements.

COMPLIANCE EFFORTS

In November 1992, Alumax conducted studies of potential VOM control technologies for its hot rolling (Exh. 1) and cold rolling (Exh. 2) processes. No add-on control technologies were found at any facility. Alumax investigated control technologies used at sources with similar emissions. The technologies investigated for both the hot rolling process and the cold rolling process included incineration, oil absorption, and carbon adsorption. For the cold rolling process only, Alumax also investigated the use of stream concentration with additional controls. Subsequently, after Alumax performed its emissions tests in August - September 1993, Alumax recalculated the costs of various control methods using the updated data. The results of these investigations are discussed below.

Incineration. Alumax investigated the installation and operation of an incinerator for both its hot and cold rolling

mill emissions. The estimated annual cost of installing and operating an incinerator for the hot rolling process is $174,500 per ton, assuming a capture and control efficiency of 81 percent, although such efficiency is not guaranteed by the equipment vendor. (Exh. 6.) The estimated annual cost of installing and operating an incinerator for the for the cold rolling process is estimated to be $25,811 per ton. (Exh. 7.) Alumax asserts that these costs render the technology economically unreasonable.

Alumax also asserts that incineration is technologically infeasible for the hot rolling process, due to low-level, variable VOM concentrations and high water concentration in the hot rolling mill emissions. (Exh. 1 at 13 - 15.) These conditions would require the use of supplemental fuel, which would increase operating costs, and could result in incomplete combustion, which would generate additional VOM emissions and nitrogen oxides emissions. (Id.)

Alumax also asserts that incineration is an unsafe technology for use on either the hot or cold rolling mills. The variable nature of the emissions from the rolling processes can lead to a buildup of an explosive level of fumes in the exhaust system. An incinerator would introduce a flame source into this environment, creating an unwarranted risk of mill fires. Alumax points out that incineration is not used as an emission control technology on rolling mills anywhere in the world. (Exh. 2 at 16.)

Oil Absorption. Alumax also investigated the use of oil absorption for both its hot and cold rolling processes. (Exh. 1 at 15; Exh. 2 at 18.) This technology uses a scrubber system wherein the mill exhaust gas stream is exposed to a wash oil that absorbs the VOM. The VOM is then separated from the wash oil by use of a continuous vacuum distillation system, and the wash oil is recirculated for reuse.

For the hot rolling process, Alumax asserts that the varying vapor pressures that result from the use of the oil in water emulsion as a rolling lubricant render this technology ineffective. (Exh. 1 at 16-17.) There are no vendors which have such a treatment system available for a hot rolling process or any oil and water emulsion. Alumax therefore has found this process to be technologically infeasible for the hot rolling process.

While oil absorption has been used as a treatment technology for new cold rolling mill installations, it has not been used as a retrofit technology. (Exh. 2 at 18 - 20.) Retrofitting an existing plant for application of this technology would be constrained by many site specific factors, due to the size of the control units and the complex ductwork required. The structures necessary to treat one large rolling mill would occupy an area of

approximately 40 by 55 feet, and would weigh at least 50 tons. (Exh. 2 at 20.) This would need to be constructed adjacent to each of the existing mills, and would require establishment of a suitable foundation for each unit. Alumax determined that the annual cost of retrofitting its cold rolling mills with oil absorption technology would be $40,200 per ton. (Exh. 7.) Therefore, Alumax asserts that this technology is economically unreasonable.

Carbon adsorption. Carbon adsorption is a two-phase process wherein hydrocarbons and other compounds are selectively attracted to the surface of an adsorbent material, generally activated carbon. The adsorbent material is then subject to regeneration, usually through steam or a vacuum. (Exh. 1 at 17; Exh. 2 at 20.) Alumax investigated the use of both fixed-bed carbon adsorption and fluidized-bed carbon adsorption systems.

Alumax found that the high vapor content of emissions from the hot rolling mill makes this technology infeasible for its hot rolling process. The water would be preferentially adsorbed by the adsorption bed, which would prevent the carbon from removing a substantial amount of VOM. (Exh. 1 at 19.) This technology therefore has never been installed on hot rolling mills. (Id.)

For the cold rolling process, Alumax found that this technology has been installed on only a single new rolling mill in the United States, and that it has never been used as a retrofit technology. (Exh. 2 at 22.) Alumax asserts that this technology is not appropriate for its facility due to the high potential for rapid fouling of the carbon beds by the heavy lubricant compounds. Additionally, due to this heavy lubricant fouling, Alumax would be unable to regenerate the carbon on-site, and would have to frequently change the carbon. (Exh. 2 at 22 - 23.)

Stream concentration. Stream concentration with additional controls was also investigated as a potential emission control only for the cold rolling process. This technique uses activated carbon to concentrate a dilute waste stream prior to ultimate disposal through incineration. (Exh. 2 at 23 - 24.)

Alumax asserts that, similar to carbon adsorption, application of this technique would be technologically infeasible due to heavy fouling of the carbon. (Exh. 2 at 24.) The expense and downtime caused by frequent fouling make this process infeasible for the Alumax facility. Additionally, even if the waste stream was concentrated 10-fold, the inlet concentration would be low, requiring the use of supplemental fuel. (Id.) The risks associated with operation of a flame source are also present. (Id.) Alumax thus asserts that this technology is infeasible for its facility.

As a result of its studies, Alumax determined that there is no add-on control technology that is proven to be technologically transferable or commercially available for its aluminum hot or cold rolling mill operations. Therefore, both Alumax and the Agency agree that the proposed alternative control requirements would result in the highest possible limitations on potential VOM emissions, and constitute RACT for both the hot and cold rolling mills. (Am. Pet. at 12.)

PROPOSED ADJUSTED STANDARD

The co-petitioners have proposed an adjusted standard which consists of the control and treatment practices currently employed by Alumax. The proposed practices include the use of low volatility lubricants, use of a low volatility solvent, and temperature controls to minimize VOM emissions. These practices are combined with the use of a hood system and Busch cyclonic unit to collect and treat emissions. The proposed adjusted standard also includes additional monitoring and record keeping requirements.

HEALTH AND ENVIRONMENTAL EFFECTS

The co-petitioners assert that there will be no significant difference in impact to the environment whether Alumax complies with the 81 percent capture and control standard set forth in Subpart TT or with the proposed alternative control requirements. The total combined difference in emissions will be approximately 76 tons per year, or approximately 0.2 tons per day. (Am. Pet. at 14.) The VOM emissions from the hot and cold rolling operations represent less than one percent of the of the 1990 point source emissions for the two designated townships in Grundy County, and far less than one/half of one percent of the 1990 VOM point source emissions for the Chicago nonattainment area. (Am. Pet. at 17.) Thus, Alumax and the Agency assert that application of the proposed alternative requirements would not have a significant adverse impact on the environment.

CONSISTENCY WITH FEDERAL LAW

The co-petitioners assert that the proposed adjusted standard would be consistent with federal law. They assert that the proposed alternative standard constitutes RACT for the facility, and is therefore consistent with the federal Clean Air Act. Furthermore, the proposed alternative requirements are consistent with a site-specific rule recently proposed by the United States Environmental Protection Agency (USEPA) for aluminum rolling operations at the Reynolds Metals facility in McCook, Illinois. (Exh. 12.)

CONCLUSION

The Board finds that the joint petitioners have demonstrated that an adjusted standard is appropriate for the Alumax facility in Morris, Illinois. The co-petitioners have demonstrated that there is no other technologically transferable and economically feasible control technology, and have demonstrated that the proposed alternative standard will not significantly impact human health or the environment. Because petitioners have demonstrated that there is no add-on technology which can be applied as RACT to the Alumax facility which would enable it to meet the 81 percent VOM emissions reduction mandated by Section 218.986, we find that petitioners have demonstrated that factors relating to Alumax are substantially and significantly different from those relied upon by the Board in adopting the rule of general applicability, and that these factors warrant the granting of an adjusted standard. Furthermore, petitioners have demonstrated that the proposed alternative standard will be consistent with federal law. The proposed adjusted standard will accordingly be granted, subject to conditions as suggested by the parties.

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

ORDER

Alumax Inc. is hereby granted an adjusted standard from 35 Ill. Adm. Code 218.986, pursuant to 415 ILCS 5/28.1, for its facility located in Morris, Grundy County, Illinois, subject to the provisions and conditions listed below:

A) The adjusted standard pertains to VOM emissions from the operation of Alumax's aluminum hot rolling mill and two aluminum cold rolling mills.

B) The alternative control requirements proposed in the December 20, 1993 petition for adjusted standard, based upon current operating procedures of the VOM emission sources identified in paragraph (A) above, represent Reasonably Available Control Technology (RACT) and no additional controls are required to meet the requirements of 35 Ill. Adm. Code 218.986 (a), (b), (c), (d), or (e).

C) Alumax shall comply with the following requirements at its aluminum hot rolling mill:

1) Rolling lubricants shall consist of oil-in-water emulsions, with formulations of no more than 10 percent, by weight, of petroleum-based oils and additives. Records shall be maintained of such emulsion formulations, with identification of all

oils and additives.

2) A grab sample of the as-applied rolling lubricant shall be taken on a monthly basis during any month that the mill is in operation and each such sample shall be tested, using ASTM method D95-83, to determine the percent, by weight, of petroleum-based oils and additives.

3) The inlet sump rolling lubricant temperature shall not exceed 200° F and such temperature shall be monitored at all times that the mill is in operation by the use of thermocouples and measured values shall be automatically recorded at least every five (5) minutes by means of a computer data system.

4) All records of emulsion formulations, percent oil tests, and rolling lubricant temperatures shall be retained for a period of at least three (3) years and be available for inspection by the Agency.

D) Alumax shall comply with the following requirements at each of its aluminum cold rolling mills:

1) Rolling lubricants shall consist of low vapor pressure lubricants composed of highly paraffinic oils and additives. Records shall be maintained of rolling lubricant formulations, with identification of all oils and solvent additives.

2) The initial and final boiling points of the as-received oils shall be between 440 and 650° F. All incoming shipments of oils shall be sampled and a distillation range test shall be performed, using ASTM method D86-90, on each such sample to determine the initial and final boiling points.

3) Stoddard solvent shall be the only solvent additive used in rolling lubricants. The initial and final boiling points of the as-received Stoddard solvent used shall be between 310 to 390° F. All incoming shipments of Stoddard solvent shall be sampled and a distillation range test shall be performed, using ASTM method D86-90, on each such sample to determine the initial and final boiling points.

4) The initial boiling point of the as-applied rolling lubricants shall be greater than 310° F, and no more than 10.0 percent of the as-applied

rolling lubricants shall boil off between the initial boiling point and 440° F. A grab sample of the as-applied rolling lubricants shall be taken on a monthly basis from each mill during any month that a mill is in operation and a distillation range test, using ASTM Method D86-90, shall be performed on each such sample to determine the initial boiling point and the amount boiled off between the initial boiling point and 440° F.

5) The inlet sump rolling lubricant temperatures at each mill shall not exceed 150° F and such temperatures shall be monitored at all times that a mill is in operation by the use of thermocouples and measured values shall be automatically recorded at least every five (5) minutes by means of a computer data system.

6) All records of rolling lubricant formulations, distillation tests for oils, Stoddard solvent, and as-applied rolling lubricants, and rolling lubricant temperatures shall be retained for a period of at least three (3) years and be available for inspection by the Agency.

E) A written report shall be submitted to the Agency indicating any deviations from the requirements of paragraphs (C)(1) - (3) and D(1) -(5) above. The written report shall provide a description of the deviation, the date and time of the deviation,the measured or monitored data, the cause of the deviation, if known, and any corrective action taken. Unless more frequent or detailed reporting is required under other provisions, including permit conditions, such written report shall be submitted, for each calendar year, by February 15 of the following year.

(F) This Adjusted Standard is effective upon granting by the Board. Alumax shall comply with the provisions and conditions listed above within 60 days of the Board's Final Order in this matter.

G) In the event that Alumax ceases to own and operate this facility, the above requirements shall apply to any subsequent owners and operators of the facility.

IT IS SO ORDERED.

Section 41 of the Environmental Protection Act (415 ILCS 5/41 (1992)) provides for the appeal of final Board orders within 35 days of the date of service of this order. The Rules of the Supreme Court of Illinois establish filing requirements. (See also 35 Ill. Adm. Code 101.246. "Motions for Reconsideration.")

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 1st day of September, 1994, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board