

ILLINOIS POLLUTION CONTROL BOARD  
September 13, 1989

IN THE MATTER OF: )  
)

LIMITS TO VOLATILITY OF )  
GASOLINE )

R88-30(A), (B)  
)  
)  
)

PROPOSED RULE.      FIRST NOTICE.

OPINION AND ORDER OF THE BOARD (by J.D. Dumelle):

SUMMARY OF BOARD ACTION

The Board today creates two separate Dockets within the original Docket R88-30 and adopts an Order sending both subdocket proposals to first notice. Docket A proposes a new section to the Illinois Administrative Code which will limit the volatility of gasoline sold throughout Illinois to 9.5 pounds per square inch (psi) Reid vapor pressure (RVP) beginning with the summer of 1990. Docket B proposes a similar section which further limits the volatility of gasoline sold in Illinois to 9.0 psi RVP beginning with the summer of 1991. The Board has determined that an economic impact study (EcIS) need not be conducted on the Docket A proposal; however, the Board has determined that an EcIS should be conducted on certain limited aspects of the Docket B proposal. Because of the importance of controlling the formation of ozone and because of the significant reduction of ozone precursors resulting from a 9.0 psi RVP limitation, the Board requests that the Department of Energy and Natural Resources (DENR) conduct EcIS, but only if it can be submitted to the Board on or before June 30, 1990. The Board deems it essential to have the EcIS by that date so that it can consider enactment of the rule in time for implementation during the summer of 1991 and so that the regulated community will have ample forewarning.

BACKGROUND

Ozone pollution is one of the nation's most serious and complex air pollution problems. Ozone is a photochemical oxidant and the major component of smog. Unlike other pollutants, ozone is not emitted directly into the atmosphere but is formed through chemical reactions among precursor emissions (volatile organic compounds or VOCs, nitrogen oxides, carbon monoxide and other compounds) in the presence of sunlight. The rate of ozone production is increased when atmospheric temperatures are warmer.

The hot summers of 1987 and 1988 resulted in high levels of ozone in the Chicago and Metro East non-attainment areas. Readings as high as 0.22 ppm by volume were recorded, which is some 83% above the federal and Illinois air quality standard of 0.12 ppm by volume. However, the ozone problem is not specific to Illinois.<sup>1</sup> The United States Environmental Protection Agency (USEPA) estimates that there are more than 80 urban areas where the ozone air quality standard is being exceeded.

New and emerging scientific data is shedding more light on the effect high levels of ozone have on the general public. Ozone severely affects individuals with chronic heart, lung, and circulatory system diseases. Otherwise healthy individuals who exercise while ozone levels are high can experience reduced functioning of the lungs, leading to chest pains, coughing, wheezing, and pulmonary congestion. In addition to the health effects, ozone has been estimated to cause two to three billion dollars worth of crop damage nationally each year. Also, because the Chicago area has exceeded the ozone standard repeatedly, USEPA has imposed a construction ban on the Chicago non-attainment area which prohibits the construction or modification of major air pollution sources and thus restricts the economic development of the Chicagoland area.

In its comments (P.C. 23), the Illinois Environmental Protection Agency (Agency) noted that in the early 1970's, the average summertime RVP of gasoline was approximately 9.0 psi. However, with the phasing out of leaded gasoline, refiners began adding butane to meet octane requirements which increased the RVP levels. The Agency noted that it was not aware that the typical summer RVP of gasoline in Illinois was well above 9.0 psi until late in 1987. As a result, Agency estimates of VOC emissions during the 1970's and 1980's from both stationary and mobile gasoline-related sources have been made using an RVP approximately 20-25% lower than actual RVP. Accordingly, those emissions have been underestimated by approximately 20-25%. Thus, during this period that the Agency had been actively engaged in imposing reasonably available control technologies (RACT) on major sources of air pollution, the increase in gasoline RVP was causing a significant increase in the emission of ozone precursors. Much of the benefit of the RACT regulations was lost as a result. Reducing the summertime volatility of gasoline to 1970 levels is expected to correct this situation.

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<sup>1</sup>See., e.g., Ecko Glaco Corp. v. EPA, PCB 87-41 (December 17, 1987), wherein the Board found "frequent, pervasive and substantial violations of ambient air quality standards for ozone in Northern Illinois". (pp.4-5)

To cure all of these ozone related problems, federal, state, and local governments have attempted to limit the emission of ozone precursors. One method of limiting such emissions is to reduce the volatility of gasoline. Volatility, generally speaking, is the rate at which a substance evaporates into the atmosphere -- the higher the volatility, the faster the evaporation. As will be discussed below, reducing the volatility of gasoline sold in Illinois, and ultimately the country, is believed to be a giant step forward in solving the ozone problem.

On August 19, 1987 the United States Environmental Protection Agency (USEPA) published a notice of proposed rulemaking (52 Fed. Reg. 31274) proposing to require gasoline refineries to reduce the volatility of their summertime commercial fuels and to require manufacturers of most gasoline fueled vehicles to make minor improvements in the design of their existing evaporative emission control systems. The purpose of USEPA's action was to control the emission of organic materials which are precursors to the formation of ozone. USEPA held a public hearing on October 27, 1987, on both the proposed volatility and refueling control programs and accepted public comment until February 11, 1988.

It has been estimated that reducing gasoline RVP to 9.0 psi in Illinois could result in summertime weekday emissions reductions of 103,000 kg/day or 41,000 tons/year. Such a reduction may reduce ozone levels by 10-15%. Although this alone may not solve the ozone problem, it would be significant step forward.

However, by December of 1988, well over one year from the date of USEPA's proposed rulemaking, the date for the final adoption of a national gasoline volatility limit remained uncertain. This uncertainty, coupled with a desire to avoid further ozone excursions, prompted the Board on January 5, 1989 to adopt an order requesting written public comment on various aspects of the gasoline volatility issue, i.e., the feasibility of reducing the RVP of gasoline to 9.0 pounds per square inch (psi) by the summer of 1989, the anticipated costs of reducing the gasoline volatility, the status of the USEPA's rulemaking to reduce gasoline volatility, etc. Written public comments were received through March 1, 1989. Twenty-one (21) written public comments were submitted into this docket by March 1, 1989, by various members of the public and of the regulated community. An additional five (5) public comments were received by March 8, 1989.

On March 9, 1989, the Board adopted an order stating its intent to proceed with a proposal for rulemaking. The Board noted that the written public comment would require careful review and that the pending USEPA action was uncertain; thus, further action would be forthcoming.

On March 22, 1989, USEPA published at 54 Fed. Reg. 11868 "Phase I of a two-phase reduction in summertime commercial gasoline volatility". The federal regulation limits the volatility of gasoline in Illinois to 10.5 psi north of 40° Latitude and 9.5 psi south of 40° Latitude. The 40° Latitude line is an east-west line south of Beardstown, Champaign and Danville and north of Quincy, Springfield and Georgetown.

PROPOSAL

On April 4, 1989, the Chicago Lung Association (CLA) submitted a proposed rule, a statement of reasons, and a motion to waive the 200 signature requirement of Section 28 of the Environmental Protection Act (Act) and Section 102.121(a) of the Board's procedural rules, 35 Ill. Adm. Code 102.121(a).

Noting that it was pleased USEPA acted on the gasoline volatility issue for the summer of 1989, the Chicago Lung Association (CLA) stated that it believes that the rule "does not provide adequate control of gasoline (VOC) emissions for Northeast Illinois." See Statement of Reasons, p.1. "In light of the immediate need for more stringent controls on gasoline volatility to improve the air quality in Northeast Illinois," CLA proposed the following rule:

1. Prohibited Activity. During regulatory control periods no refiner, importer, distributor, reseller, carrier, retailer or wholesale purchaser-consumer shall sell, offer for sale, dispense, supply, offer for supply, or transport gasoline whose Reid vapor pressure exceeds the applicable standard listed in paragraph 3.
2. Regulatory Control Period. The regulatory control period for calendar year 1989 is June 30 to September 15 for retail outlets and wholesale purchaser-consumer facilities: And June 1 to September 15 for all other facilities. The regulatory control period for calendar year 1990 and beyond is June 1 for retail outlets and wholesale purchaser-consumer facilities: And May 1 to September 15 for all other facilities.
3. Applicable Standard. The applicable standards for this rule are, in pounds per square inch Reid vapor pressure:

<u>Year</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>
1989	10.5	10.5	9.5	9.5	10.5
1990 and beyond	9.0	9.0	9.0	9.0	9.0

4. Special Provisions for Alcohol Blends. The Reid vapor pressure of ethanol blend gasolines shall not exceed the applicable standard for gasoline by more than one pound per square inch. Ethanol blend gasolines are defined as those which contain at least 9% ethanol (by volume). The maximum ethanol content shall not exceed any applicable requirements of the Clean Air Act.

On April 6, 1989, the Board adopted an order granting the motion to waive the 200 signatures, but requiring additional information from the proponent before the proposal could be accepted for hearing. On April 13, 1989, CLA submitted its response to the Board's more information order.

On April 27, 1989, the Board accepted the CLA proposal and directed the Hearing Officer to schedule hearings. The Board also noted that Section 27(a) of the Act permits any person to request the Board to determine that an economic impact study (EcIS) should or should not be prepared. Nine public comments were received in response to this order (P.C. 30-38).

On June 22, 1989, the Board adopted an order noting the nine comments and determining that an EcIS need not be prepared at that time. The Board noted that the record compiled contained a fair amount of economic discussion. Moreover, the Board noted that hearings were scheduled for July 17 and 21, 1989, and additional economic information was likely to be introduced therein. As the Board was required to make an EcIS determination, the Board determined that, at that time, an EcIS was not necessary. As will be discussed below, the Board reaffirms that determination with respect to the Docket A proposal and will not require an EcIS to be done. However, with respect to the Docket B proposal, the Board determines that an EcIS should be conducted.

#### PUBLIC HEARINGS

On July 17 and 21, 1989, the Board conducted public hearings to address the CLA proposal to limit the volatility of gasoline. Presenting testimony on July 17, 1989 were the Chicago Lung Association, United States Environmental Protection Agency, the Illinois Petroleum Council, Amoco Oil Company, Phillips 66, Marathon Oil Company, and the Motor Vehicle Manufacturers Association (MVMA). Presenting testimony on July 21, 1989, were Mobil Oil Corporation and the Chicago Lung Association.

At hearing, the Hearing Officer established a post-hearing comment schedule, ordering that comments be submitted on or before August 7, 1989. Six post-hearing comments were submitted in a timely fashion (P.C. 42-47). Mobil Oil Corporation filed its comments on August 15, 1989. On August 17, 1989, CLA filed an additional comment along with a motion to file instant.

CLA's motion is hereby granted. Although Mobil's comment was not submitted under a motion to file, the Board will accept the comment into the record. Mobil's comment was submitted in time to permit adequate consideration; no participant will be prejudiced; and the record will be complete, which is the Board's ultimate goal.

#### FEDERAL VOLATILITY RULE

A major preliminary issue raised since the Board originally opened this docket in December of 1988 is whether Illinois need persevere in the rulemaking process for a statewide rule when the federal government is already in the process of adopting a nationwide regulation that will accomplish the same result. As noted above, USEPA originally proposed a gasoline volatility rule on August 19, 1987. When the Board opened this docket in December of 1988, USEPA had shown no movement toward the final adoption of a regulation. It was not until March of 1989 that USEPA proceeded to final adoption of a rule, and at that it was only an interim measure, as USEPA adopted only "Phase I of a two phase reduction in summertime commercial gasoline volatility". 54 Fed. Reg. 11868. Many comments note that USEPA's action indicates that the Phase II completion of the gasoline volatility regulation is inevitable; therefore, the comments suggest that the Board recede in its attempt to adopt a rule applicable only to Illinois.

In its proposal, CLA noted that USEPA had adopted the first phase of a two phase program and pointed out that USEPA had made no commitment as to when, if ever, the second phase would be promulgated. It was this uncertainty together with the interim standards of 10.5 psi for northern Illinois and 9.5 psi for southern Illinois that prompted CLA to propose the more stringent limitation of 9.0 psi for all of Illinois for the summer of 1990 and each year thereafter. CLA calculates that a gasoline volatility reduction from 10.5 to 9.0 psi in northeast Illinois would result in a 199.5 ton/day reduction in VOC emissions. (R. 43.) CLA also notes that an Illinois Environmental Protection Agency (Agency) planning document from April 1988, though not an official declaration of the VOC reduction value of various control options, indicates a gasoline volatility reduction from the then current levels (11.5 psi) to 9.0 psi was thought to be the largest single reduction option available in Illinois. Id.

The Board notes that the record contains testimony of USEPA. At hearing on July 17, 1989 USEPA stated "[today ... you are considering a rule submitted by the Chicago Lung Association which would limit the volatility of gasoline in the State of Illinois, and USEPA supports the adoption of this measure." (R.11. Emphasis added.) USEPA stated further that its proposed Phase II program is expected to be published by early next year, but implementation nationwide is not expected before 1992. USEPA

also addressed the potential benefits of early implementation, stating:

According to our draft inventory, mobile source VOC emissions account for roughly 50 percent of the total VOC emissions in the Chicago, Illinois area, or approximately 1086 tons per day (tpd). Reducing the allowable gasoline volatility to 9.0 psi in 1990 would achieve a 24 percent reduction in evaporative emissions between 1990 and 1992, or a total of 261 tpd. The costs of complying with this program are offset by savings for consumers resulting from an increased fuel economy due to the increased energy density of lower RVP fuel and as less fuel is lost through evaporation and running losses. Further, it is believed that much if not all of the butane displaced from direct use in gasoline in order to comply with the volatility limits will be used in the production of other gasoline components.

R. 14-15.

In short, USEPA supports the proposed regulation. It believes that Illinois can achieve significant emission reductions by requiring a summertime RVP of 9.0 psi beginning in 1990, and it believes that the severity of the Chicago ozone problem requires Illinois to take all reasonable actions to protect the health and welfare of its citizens. (R. 15.)

Based on the potential reduction in VOC emissions resulting from early implementation of this proposal and based on USEPA's express support for the proposal, the Board is not inclined to await for implementation of USEPA's Phase II program. This Board has a statutory duty to determine, define and implement the environmental control standards applicable in Illinois, pursuant to Section 5 of the Environmental Protection Act (Act). The Board believes that the severity of the ozone problem requires prompt, affirmative action on the part of regulators, state and federal alike.

#### ECONOMIC IMPACT

The Board's Order of June 22, 1989 in this docket addresses the issue of whether an economic impact study (EcIS) would be prepared. As noted in that Order, Section 27(a) of the Act requires that the Board make a determination within 60 days of the acceptance of a proposal. Noting that the record at that time already contained a fair amount of economic information and noting further that hearings were scheduled at which additional economic information was expected to be submitted, the Board

determined that an EcIS need not be prepared. The Board noted, however, that Section 27(a) permits the Board to determine after the 60 days that an EcIS need be done if new information indicates that one need be done. The Board here addresses the issue of economic impact and the need for an EcIS.

Section 27(a) of the Act sets forth the Criteria that the Board is to consider when determining whether an EcIS should be conducted. Section 27(a) states in relevant part:

The Board shall reach its decision based on its assessment of the potential economic impact of the rule, the potential for consideration of the economic impact absent such a study, the extent, if any, to which the Board is free under the statute authorizing the rule to modify the substance of the rule based upon the conclusions of such a study, and any other considerations the Board deems appropriate.

Many of the commenters, primarily the refineries and gasoline distributors, specifically requested that the Board determine that an EcIS be prepared. In comments and at hearing, the Illinois Petroleum Council (IPC) strongly advocated for the preparation of an EcIS, arguing that in declining to require an EcIS, the Board is overlooking several key considerations. First, IPC argues that Illinois is the hub of the midwest gasoline supply and distribution system, and asks what impact would limiting gasoline volatility to 9.0 psi in Illinois have on both Illinois and other states supplied by Illinois based refineries. Second, IPC asks how much improvement in Illinois' ambient air quality would volatility control produce, especially in light of the large summertime natural source volatile organic compound emissions in the state. Third, what is the real cost to Illinois consumers and is this cost reasonable and commensurate with the expected improvement in air quality? Fourth, would not a 1.0 psi waiver for ethanol blends negate the improvement in Illinois' air quality expected from a reduction in RVP levels? And finally, IPC asks does the Clean Air Act allow the state to adopt more restrictive environmental controls absent their inclusion in an approved state implementation plan (SIP)?

Other commenters, primarily the proponent CLA and NESCAUM, argue that the economic information in the record is sufficient to support the proposed regulation, that an EcIS need not be prepared, and that the impact will be reasonable. In support of their argument, these commenters note that the Chicago area is non-attainment for ozone. As a result, Chicago is currently under a construction ban, which means that no new construction or modification of a major air emission source may take place. This alone restricts economic development of the Chicago area. CLA estimates that adoption of this rule will result in emission reductions of approximately 199.5 tons/day. CLA further



estimates that this value is nine percent of the estimated 1988 VOC inventory of 2,186.9 tons/day and thirteen percent of the reductions estimated by USEPA to be necessary to bring the Chicago area into attainment, and thereby lift the construction ban. USEPA estimates that early implementation of this rule will reduce emissions by 261 tons/day. CLA also notes that the Agency has noted its belief that the emission reductions resulting from a gasoline volatility limit of 9.0 psi would be the largest single reduction option available in Illinois.

In further support of their position, these commenters argue that other benefits would result as well. They argue that adoption of this rule would go a long way toward avoiding the adverse health effects, noted above, associated with excessive ozone levels. In addition, crop damage resulting from high ozone levels would be minimized. CLA argues that Illinois crop yields will improve, as major crops for the Illinois farm economy are sensitive to ozone-induced yield loss even at the relatively low concentrations at which ozone is found in the farm areas of the state. For Illinois this was valued to be worth 226 million dollars for a ten percent reduction in ozone levels experienced in 1980. As the estimated ozone reduction resulting from implementation of this rule is two percent, this calculates to a potential benefit of approximately 45 million dollars. Also, CLA and USEPA point out that another benefit will be increased fuel economy due to the increased energy density of lower RVP fuel and as less fuel is lost through evaporation and running loss.

As a preliminary matter, the Board notes that the nature of this rulemaking is somewhat different from most other rulemakings. In this rulemaking, the Board is being asked to adopt early a rule which USEPA is in the process of promulgating. In its consideration of this rule, USEPA has considered and addressed the economic impact upon the regulated community. USEPA has already adopted the first phase of that rule. USEPA has stated on the record in this proceeding that it expects to publish the final phase of its rule early next year, with an effective date of 1992. The final rule is expected to limit the volatility of gasoline in Illinois, and other areas, to 9.0 psi RVP. Thus, a 9.0 psi RVP limitation appears inevitable, which means that the economic impact will result, whether the Board acts or not.

The question, then, in determining whether an EcIS need be conducted is not necessarily what is the economic impact of a gasoline volatility rule in Illinois; more precisely the question is what is the economic impact of early implementation of the federal gasoline volatility rule in Illinois?

The record indicates that reducing the volatility of gasoline from 11.5 to 9.0 psi, taking all of the above considerations into account, would result in a price increase of

gasoline of approximately 1-3 cents per gallon. This estimate preceded adoption by USEPA of phase I of its rule. The record is not clear on what the approximate cost per gallon would be in Illinois now that the standard is 10.5 psi. In other words, the record does not articulate what the cost of reducing the volatility of gasoline from 10.5 to 9.0 psi will be per gallon. The Board can only assume that it will be less than or equal to 1-3 cents per gallon. Market forces as they are, the economic burden of this rule will still be carried by the consumer. In relation to the benefits derived from this rule, however, a 1-3 cent cost per gallon of gasoline is not unreasonable. And again, part of this cost increase will be offset by increased fuel economy resulting from the use of lower RVP gasoline.

Put another way, the total cost of implementation appears to be less than \$1000 per ton of VOC controlled. According to P.C. 42, the Office of Technology Assessment has estimated the cost to be in the range of \$320 - 700 per ton of VOC controlled. CLA notes that the Agency has estimated the cost effectiveness (using the old emission inventory) for gas volatility reduction to 9.0 psi was \$982 - 1,129 per ton of VOC controlled. CLA's own estimates put the costs of control at approximately \$1,000 per ton. CLA notes that this cost estimate is well within the range of cost effectiveness values associated with the adoption of other Reasonably Available Control Technology (RACT) regulations. Mobile, however, estimates that the cost would be approximately \$2,000/ton.

The Board notes that these cost estimates include a consideration of most of the issues raised by the potentially regulated community. The Board turns next to one of the major issues that has proven more difficult to analyze. Many commenters have argued that a 9.0 psi RVP limitation in Illinois would set Illinois apart from the rest of the midwest region, making Illinois, for all effective purposes, a "specialty" state in terms of refining and distributing gasoline. Generally, the midwest region includes Illinois, Indiana, Wisconsin, Michigan, Iowa, Missouri, Minnesota, and Kentucky. Of these, Indiana, Wisconsin, Michigan, Iowa, Minnesota and Kentucky are subject to a 10.5 psi RVP standard. The southern portion of Illinois, Missouri, Oklahoma, Tennessee, and Arkansas are subject to a 9.5 psi standard. The commenters argue that limiting the volatility of gasoline in Illinois to 9.0 psi while many of the other states operate under a 10.5 psi standard would impose a burden upon the refiners and distributors in three fundamental respects.

First, the commenters argue that the distribution network is not equipped to accommodate a 9.0 psi RVP gasoline. Illinois refineries are presently producing gasolines of 10.5 to 9.5 psi for distribution in Illinois, Indiana, Wisconsin, etc. 10.5 psi gasoline is presently being distributed in Indiana, Wisconsin, and the northern part of Illinois, i.e., north of 40 degrees

Latitude. 9.5 psi gasoline is presently being distributed in southern Illinois and Missouri. Most of the gasoline supplied in the midwest is provided primarily by refiners in and around Illinois. In addition, the commenters argue that supplements to this supply are provided by shipments from the Gulf Coast and from Canada. While the commenters note that Gulf Coast supplies have become tight due primarily to pipeline capacity constraints and that imports from Canada have been rather sporadic, they argue that it would be difficult to supplement the midwest region's supply of gasoline from these sources because it would be difficult for the pipeline operators to supply only Illinois with 9.0 psi gasoline while the remainder of the upper midwest region receives 10.5 psi gasoline.

Second, the commenters argue that if they are required to produce and market a 9.0 psi gasoline, or a "specialty" gasoline product, they will be placed in a position of economic disadvantage with their out-of-state competitors who are not required to produce 9.0 psi gasoline. These commenters argue that because their competitors will not be required to incur the expense of producing 9.0 psi product, these competitors will be able to sell their product at a lower price.

Third, the commenters argue that limiting Illinois to a 9.0 psi standard would impose a burden on gasoline suppliers in times of spot shortage. For example, one of the hearing participants (Mobil) offered the following testimony on this point:

Right now if we have a spot shortage in Chicago or Illinois, or somewhere in the State of Illinois, some city has a spot shortage, we can bring product in from Minnesota, we can bring it from Indiana, we can bring it in from Wisconsin. We cover it like that. And it is no problem.

But if you have a nine pound standard in Chicago, and there is a ten and a half pound standard in Indiana, we can't do that. Now, where do we go for the product to cover that temporary disruption? We don't know.

(R. 272.)

Thus, the record indicates that in times of spot shortages, Illinois, if under a 9.0 psi standard, would be unable to conveniently make up the shortage using supplies from other states.

It is based upon these issues and concerns that the Board has determined that the appropriate course is to split this docket into two separate proposals, Docket (A) and Docket (B).

In Docket (A), the Board proposes a 9.5 psi RVP limitation statewide, and determines that an EcIS need not be conducted. Because the southern portion of Illinois, i.e., south of 40 degrees Latitude, is currently operating under a 9.5 psi standard, the Board believes that much of the concern noted above will be avoided. In other words, Illinois refiners are currently producing 9.5 psi gasoline for distribution in Illinois, and Missouri. Illinois will not be a "specialty" state; Illinois refiners will not be placed in a position of economic disadvantage. Since refiners are producing 9.5 gasoline for southern Illinois, there should be little difficulty in producing it for northern Illinois as well. Further, in times of spot shortage in northern Illinois, the marketers can turn to supplies in southern Illinois and adjoining states to make up the difference. According to USEPA's post hearing comments, adoption of a 9.5 psi limit could result in almost 80% of the potential benefits to be derived from a 9.0 psi standard (P.C. 44).

In Docket (B), however, the Board proposes the 9.0 psi RVP limitation statewide and determines that an EcIS need only be conducted on the issues discussed above, namely whether a 9.0 standard in Illinois would be economically or technically unreasonable or pose an economic hardship in terms of supplying gasoline to Illinois and the other midwestern states; whether a 9.0 standard in Illinois would impose economic hardship in events of spot shortages and an economic analysis of granting the 1.0 psi exemption for ethanol blenders. As will be discussed below, the Board also requests that the EcIS review the impact if the proposed subsection (i) requirement that retail outlets and other facilities maintain records regarding each delivery of gasoline. The Board specifically requests that the Department of Energy and Natural Resources (DENR) prepare and submit this EcIS to the Board on or before June 30, 1989. The Board makes this request so that it will have time to adopt the rule if found to be feasible in time for 1991 implementation.

#### TECHNICAL FEASIBILITY

As previously described, "volatility" of a liquid is a measure of its tendency to evaporate. Gasoline is a mixture of a number of hydrocarbon components which are very volatile under most conditions. Certain hydrocarbons, known as "light-end" hydrocarbons, are among the most volatile components of gasoline. Butane is a light-end hydrocarbon. Light-end hydrocarbons make up the largest part of gasoline vapor. Evaporated gasoline, however, will also include certain amounts of heavier hydrocarbons. Benzene, one of the heavier compounds, is a known carcinogen in addition to contributing to ozone.

#### Reformulation

As a practical matter, implementation of this rule will be

effectuated by the reformulation, or alteration of the chemical composition, of the gasoline distributed in Illinois. The primary approach that gasoline refiners would take to reduce the volatility of gasoline products would be to add less butane during the refining process. Apparently, in the early 1970's, gasoline volatility had an average RVP of approximately 9.0 psi. With the phasing out of lead in gasoline, refiners began to add butane to gasoline to meet octane requirements. Butane was chosen because it is relatively inexpensive and because it increases octane. However, it also substantially increases volatility. P.C. 42, p.1. Thus, reducing the amount of butane will have the result of decreasing the volatility of the gasoline.

Based on a review of the record, the Board determines that reducing the level of butane in gasoline products would be technically feasible. In most cases, refiners simply need not add butane to the gasoline product. Evidence for this determination is found in the fact that refiners in Illinois already produce gasoline with a volatility of 9.5 psi RVP.

However, many participants, primarily the refiners, note that by not adding the butane to gasoline, the refiners will incur costs for butane removal, butane storage, loss of butane value, octane value replacement, and/or compliance testing. One commenter, P.C. 6, further notes that butane is contained in crude oil as well as being produced in processing units. Processing units like the catalytic reformer and fluid catalytic cracker increase butane production when operating to produce higher octane gasolines. These commenters argue that the surplus butane would have no economic value in the refinery. Thus, new markets for the butane must be developed. Once these markets are developed, the refiner must make refining modifications as well as construct storage and transportation facilities. These commenters believe that the costs associated with such facilities would be excessive.

The Board is not persuaded by the record that it would be technically infeasible for refiners to remove, store, and/or reuse the butane at a later date. The Board can see no reason why the refiners cannot remove the butane during the regulatory control period, i.e., July and August, and then reuse it during the colder winter months when ozone formation is not a problem. The commenter's argument that storage facilities must be constructed is not, in and of itself, dispositive of this issue. The Board is aware of the existence of potential storage facilities that are apparently being unused.<sup>2</sup> The Board

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<sup>2</sup>For example, the Board notes the existence of potential storage facilities for butane at the former Texaco Refinery in Lemont, Illinois.

specifically requests comment on the potential availability of these and other facilities for the purpose of butane storage.

Further, the Board notes that the commenters' arguments are directed more to the merits of the gasoline volatility rule in general than to the early implementation of the rule. When the federal rule is adopted, the refiners will be required to remove the butane and do something with it. The Board's consideration of early implementation of the rule merely requires the refiners to begin the search for storage facilities or new markets sooner than the federal rule would.

### Safety/Driveability

Many of the commenters argue that the Board should not proceed with this rulemaking because 9.0 psi RVP gasoline would likely give noticeably degraded driveability performance in the early spring and late fall when product would be in the distribution system to ensure compliance with the restriction period. One of the commenters, P.C. 48, submitted a study prepared August 1, 1988 for submission to the American Petroleum Institute. Results of the study are as follows:

- (a) 30% of the vehicles tested showed significant deterioration in driveability performance (at least two or more have hesitation and/or stalls) with 9.0 psi RVP fuel compared to the typical 13.5 psi RVP fuel.
- (b) There were nearly twice as many start stalls with the 9.0 psi RVP fuel compared to the 13.5 psi RVP fuel within the 51 vehicle fleet tested.
- (c) Average driveability performance with the tank fuel (average RVP = 13.0 psi) was similar to performance with the nominal 13.5 psi RVP test fuel.
- (d) Test temperatures for this program ranged from 21-30 degrees F; however, it is expected that lower temperatures than those observed during this test could occur in some ASTM Class C areas during March and November.

Many other participants submitted similar comments.

The CLA argues that vehicle performance will not deteriorate as a result of the reduced volatility, but rather vehicle performance and safety may improve. CLA points to the state of California as an example where fuel volatility has been reduced since 1971 without commensurate driveability problems. CLA further points to the comments of NESCAUM and the Motor Vehicle Manufacturers Association (MVMA) for support of its position.

At hearing, the Board received testimony from a

representative of MVMA who stated:

Because every vehicle on the road today was designed and built to operate on nine pound volatility gasoline, MVMA does not believe that vehicle performance would suffer from volatility control. In fact we believe that performance would be increased in the hot summer months due to reduction in vapor lock and stalling on those hot days when ozone is a problem. However, the concern remains regarding vehicle performance in very cold weather. This should be addressed by adjusting the effective date of the control period. It is not a reason to abandon volatility controls. (R.214-215)

Based on the record, the Board is not persuaded that implementation of this rule will result in safety or driveability problems. The study submitted in P.C. 48 was conducted under temperatures of 21 - 30 degrees F. The Docket (A) proposal requires 9.5 psi gasoline at the retail outlet during July and August. The Board does not believe it likely that northern Illinois will be subject to temperatures as cold as that during those months. The Docket (B) proposal would require 9.0 psi gasoline at the retail outlet from June 1 to September 15. The Board does not believe it likely that northern Illinois will be subject to temperatures below 30 degrees during this period also. As a result, the Board is not persuaded that gasoline with a volatility of 9.5 psi, or 9.0 psi for that matter, will pose a safety/driveability problem in Illinois during the regulatory control period here proposed. In colder climates, lower volatility gasoline may pose problems, but the Board believes that those problems should not be present during the implementation of either of these proposals.

#### ENFORCEABILITY

At hearing, the IPC raised a valid question regarding whether the Clean Air Act allows the state to adopt more restrictive environmental controls absent their inclusion in an approved state implementation plan(SIP). After noting the recent case of American Petroleum Institute v. New York State Department of Environmental Conservation, 29 ERC 1457 (D.N.Y. April 4, 1989), IPC asks:

Since Illinois currently does not have an approved SIP and is bound from developing one until after the FIP has been promulgated or settled, which should be sometime in 1990, how can the Pollution Control Board possibly act on the Chicago Lung Association's proposal? (R. 81.)

The Board does not believe it is precluded from promulgating this regulation based on the decision in the API case. In fact, the Board believes it has every right and power granted under the

Environmental Protection Act (Act), Ill. Rev. Stat. 1987, ch. 111-1/2, pars. 1001 et seq., to proceed with this proposal. The Board is aware, however, that under the API decision a final adopted rule will not be enforceable until it is approved as a revision to the SIP. As USEPA has appeared in this rulemaking proceeding and has articulated its support for the rule, the Board believes that USEPA will work expeditiously to approve the rule as a revision to the SIP. Thus, the Board does not agree with IPC that the State must have an "approved SIP" before it can proceed with this rule; rather, the State must submit the adopted rule to USEPA as a revision to the SIP, and once approved as such, the rule can be enforced.

#### ETHANOL EXEMPTION

Many commenters specifically stated that if the Board proceeds with the proposal to limit the volatility of gasoline, then the Board should not include the 1.0 psi exemption for ethanol blended gasoline, as CLA proposed. These commenters argue that including a 1.0 psi exemption for blended gasolines directly contradicts the intent of limiting the volatility of gasoline, i.e., to reduce the formation of ozone.

CLA states in its submissions to the Board that it has included the 1.0 psi exemption for the following reasons. First, the USEPA rule allows a one pound exemption for gasohol (ethanol blends). To be as parallel as possible with the federal rule and to avoid confusing the regulated community, CLA retained the gasohol exemption. Second, gasohol is typically made by "splash blending" in which a certain amount of ethanol is put into a tank and to it is added a certain amount of finished gasoline, or vice versa. For example, in an area where 10.5 psi gasoline is sold, the ethanol blends will use that as a base and end up with a gasohol with a volatility about one psi higher than the base gasoline, or 12.5 psi. CLA argues that if gasohol is required to meet the same volatility limit as gasoline, i.e., 9.0 psi, gasohol blenders would require a special blending grade gasoline of 8.0 psi, which is not available. Finally, CLA states that both gasoline and gasohol will have their volatility reduced by 1.5 psi under the proposed rule. Thus, a significant reduction in the emissions from both fuels will result. Additional emission reductions could be made by further reducing the volatility of both gasoline and gasohol and that option may be appropriate for the Board to consider in the future along with other VOC reduction measures.

The Board has retained the ethanol exemption in both Dockets (A) and (B); however, certain revisions have been made. The Board has retained the 1.0 psi exemption to insure that this rulemaking is as parallel to the federal rule as possible. Again, the Board notes that the proper focus for this rulemaking is early implementation of the forthcoming federal rule.



Consistent with this intent, the Board believes that it would not be feasible to require ethanol blends to meet the same standard when the gasoline that it is blended with is already at that level. The record indicates that when ethanol is blended with gasoline, the ethanol raises the RVP approximately 0.7 psi. For this reason the Board has added the additional language to proposed Section 215.585(c), below. This language states that if after blending the RVP is raised 0.7 psi, nothing else shall be added so as to use up the remaining 0.3 psi exemption. The intent of this language is to insure that only ethanol is added to the gasoline, resulting in the increased RVP.

#### BOARD REVISIONS TO PROPOSAL

##### Docket A

The Board's proposed regulation in Docket A is similar to that proposed by CLA. However, certain additions and revisions have been made beyond that already discussed in this Opinion. The Board has drafted the proposed text in the form required under the Illinois Administrative Procedure Act (APA) and regulations adopted thereunder. Certain definitions have been proposed ("Ethanol blend gasoline", "Reid vapor pressure", "Retail outlet", and "Wholesale purchaser-consumer"), and those materials that appear to be incorporated into the text of the rule have been put into the form proper for incorporations by reference in Section 215.105. Subsection (a) sets forth the general prohibitions of selling, dispensing, etc., gasoline which exceeds the limitations set forth in subsequent subsections. The Board has revised this language to clarify that it is only gasoline sold in Illinois that is regulated.

Also the Board has shortened the regulatory control period in Section 215.585(a)(1) and (2) to cover July 1 to August 31 of each summer. As a practical matter the Board has left it to the discretion of the refiners and wholesalers as to when they will begin the production and distribution of lower volatility gasoline for it to be available at retail outlets by July 1. Note that this applies only for the Docket A proposal. Subsections (d) through (g) address the methods by which testing and sampling are to take place. The Board has attempted to remain as close to the federal rule as possible. Finally, the Board has added Subsection (h), a requirement that refiners and suppliers maintain records of the gasoline produced and shipped by them.

##### Docket B

In addition to the changes discussed above, the Board has proposed in this Section 215.585(b) a 9.0 psi RVP limitation. The regulatory control period beginning 1992 and each year thereafter has also been extended to June 1 to September 15.

This is to parallel the federal rule as much as possible. Also, the Board has added subsection (i) which will require retail outlets and other similar facilities to maintain records regarding each delivery of gasoline so as to aid in the enforcement of the rule. The Board requests that the EcIS review the impact of this proposed language as well.

ORDER

R88-30 (A)

The Board hereby proposes for First Notice the following amendments to the Illinois Administrative Code to be published in the Illinois Register.

TITLE 35: ENVIRONMENTAL PROTECTION  
SUBTITLE B: AIR POLLUTION  
CHAPTER I: POLLUTION CONTROL BOARD  
SUBCHAPTER c: EMISSIONS STANDARDS AND LIMITATIONS FOR  
STATIONARY SOURCES

PART 215  
ORGANIC MATERIAL EMISSION STANDARDS AND LIMITATIONS

SUBPART A: GENERAL PROVISIONS

Section

215.100 Introduction  
215.101 Clean-up and Disposal Operations  
215.102 Testing Methods  
215.103 Abbreviations and Conversion Factors  
215.104 Definitions  
215.105 Incorporations by Reference  
215.106 Afterburners  
215.107 Determination of Applicability

SUBPART Y: GASOLINE DISTRIBUTION

Section

215.581 Bulk Gasoline Plants  
215.582 Bulk Gasoline Terminals  
215.583 Gasoline Dispensing Facilities  
215.584 Gasoline Delivery Vessels  
215.585 Gasoline Volatility Standards

Section 215.104 Definitions

"Ethanol blend gasoline" means a mixture of gasoline and at least 9% ethanol by volume.

"Reid vapor pressure": is the standardized measure of the vapor pressure of a liquid in pounds per square inch absolute (kPa) at

100 F (37.8 C).

"Retail Outlet": means any gasoline dispensing facility at which gasoline is sold or offered for sale for use in motor vehicles.

"Wholesale Purchaser-Consumer": means any person or organization that purchases or obtains gasoline from a supplier for ultimate consumption or use in motor vehicles and receives delivery of the gasoline into a storage tank with a capacity of at least 550 gallons (2082 liters) owned and controlled by that person.

Section 215.105 Incorporation by Reference

The following materials are incorporated by reference:

- a) American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103:
  - 1) ASTM D 1644-59 Method A
  - 2) ASTM D 1475-60
  - 3) ASTM D 2369-73
  - 4) ASTM D 2879-83 (Approved 1983)
  - 5) ASTM D 323-82 (Approved 1982)
  - 6) ASTM D 86-82 (Approved 1982)
  - 7) ASTM E 260-73 (Approved 1973), E 168-67 (Reapproved 1977), E 169-63 (Reapproved 1981), E 20 (Approved 1985)
  - 8) ASTM D 97-66
  - 9) ASTM D 1946-67
  - 10) ASTM D 2382-76
  - 11) ASTM D 2504-83
  - 12) ASTM D 2382-83
  - 13) ASTM D 4057-81 (Approved 1981)
  - 14) ASTM D 4177-82 (Approved 1982)
- b) Federal Standard 141a, Method 4082.1.
- c) National Fire Codes, National Fire Prevention

Association, Battery March Park, Quincy, Massachusetts 02269 (1979).

- d) United States Environmental Protection Agency, Washington, D.C., EPA-450/2-77-026, Appendix A (October 1977).
- e) United States Environmental Protection Agency, Washington, D.C., EPA-450/2-78-051 Appendix A and Appendix B (December 1978).
- f) Standard Industrial Classification Manual, published by Executive Office of the President, Office of Management and Budget, Washington, D.C., 1972
- g) 40 CFR 60, Appendix A (1986).
- h) United States Environmental Protection Agency, Washington D.C., EPA-450/2-78-041.
- i) 40 CFR 80, Appendices D, E, and F, adopted March 22, 1989 at 54 Fed. Reg. 11897.

BOARD NOTE: The incorporations by reference listed above contain no later amendments or editions.

Section 215.585 Gasoline Volatility Standards

- a) No person shall sell, offer for sale, dispense, supply, offer for supply, or transport for use in Illinois gasoline whose Reid vapor pressure exceeds the applicable limitations set forth in subsections (b) and (c) during the regulatory control periods set forth as follows:
  - 1) The regulatory control period for calendar year 1990 shall be July 1 to August 31 for retail outlets, wholesale purchaser-consumer facilities, and all other facilities.
  - 2) The regulatory control period for calendar year 1991 and each calendar year thereafter shall be July 1 to August 31 for retail outlets, wholesale purchaser-consumer facilities, and all other facilities.
- b) The Reid vapor pressure of gasoline, a measure of its volatility, shall not exceed 9.5 psi (65.5 kPa) during the regulatory control period in 1990 and each year thereafter.
- c) The Reid vapor pressure of ethanol blend gasolines shall

not exceed the limitations for gasoline set forth in subsection (b) by more than 1.0 psi (6.9 kPa). Notwithstanding this limitation, blenders of ethanol blend gasolines whose Reid vapor pressure is less than 1.0 psi above the base stock gasoline immediately after blending with ethanol are prohibited from adding butane or any product that will increase the Reid vapor pressure of the blended gasoline.

- d) All sampling of gasoline required pursuant to the provisions of this Section shall be conducted by one or more of the following approved methods or procedures which are incorporated by reference in Section 215.105.
- 1) For manual sampling, ASTM D4057;
  - 2) For automatic sampling, ASTM D4177;
  - 3) Sampling Procedures for Fuel Volatility, 40 CFR 80 Appendix D.
- e) The Reid vapor pressure shall be measured in accordance with test method ASTM D323 or in the case of gasoline-oxygenate blends which contains water-extractable oxygenates, a modification of ASTM D323 as set forth in 40 CFR 80, Appendix E, incorporated by reference in Section 215.105.
- f) The ethanol content of ethanol blend gasolines shall be determined by use of one of the approved testing methodologies specified in 40 CFR 80, Appendix F, incorporated by reference in Section 215.105.
- g) Any alternate to the sampling or testing methods or procedures contained in subsections (d), (e), and (f) must be approved by the Agency which shall consider data comparing the performance of the proposed alternative to the performance of one or more approved test methods or procedures. Such data shall accompany any request for Agency approval of an alternate test procedure.
- h) Each refiner or supplier that distributes gasoline or ethanol blends shall:
- 1) During the regulatory control period, document and clearly designate the Reid vapor pressure of all gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois. Any facility receiving this gasoline shall be provided with a copy of the accompanying document specifying the Reid vapor pressure.

2. Maintain records for a period of two years on the Reid vapor pressure, quantity shipped and date of delivery of any gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois. The Agency shall be provided with copies of such records, if requested.

R88-30 (B)

The Board hereby proposes for First Notice the following amendments to the Illinois Administrative Code to be published in the Illinois Register.

TITLE 35: ENVIRONMENTAL PROTECTION  
SUBTITLE B: AIR POLLUTION  
CHAPTER I: POLLUTION CONTROL BOARD  
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SUBPART Y: GASOLINE DISTRIBUTION

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Section 215.104 Definitions

"Ethanol blend gasoline" means a mixture of gasoline and at least 9% ethanol by volume.

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"Retail Outlet": means any gasoline dispensing facility at which gasoline is sold or offered for sale for use in motor vehicles.

"Wholesale Purchaser-Consumer": means any person or organization that purchases or obtains gasoline from a supplier for ultimate consumption or use in motor vehicles and receives delivery of the gasoline into a storage tank with a capacity of at least 550 gallons (2082 l) owned and controlled by that person.

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- h) United States Environmental Protection Agency, Washington D.C., EPA-450/2-78-041.
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  - 1) The regulatory control period for calendar year 1991 shall be July 1 to August 31 for retail outlets, wholesale purchaser-consumer facilities, and all other facilities.
  - 2) The regulatory control period for calendar year 1992 and each calendar year thereafter shall be June 1 to September 15 for retail outlets, wholesale purchaser-consumer facilities, and all other facilities.
- b) The Reid vapor pressure of gasoline, a measure of its volatility, shall not exceed 9.0 psi (62.1 kPa) during the regulatory control period in 1991 and each year thereafter.

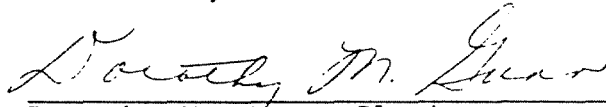


- c) The Reid vapor pressure of ethanol blend gasolines shall not exceed the limitations for gasoline set forth in subsection (b) by more than 1.0 psi (6.9 kPa). Notwithstanding this limitation, blenders of ethanol blend gasolines whose Reid vapor pressure is less than 1.0 psi above the base stock gasoline immediately after blending with ethanol are prohibited from adding butane or any product that will increase the Reid vapor pressure of the blended gasoline.
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- h) Each refiner or supplier that distributes gasoline or ethanol blends shall:
  - 1) During the regulatory control period, document and clearly designate the Reid vapor pressure of all gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois. Any facility receiving this gasoline shall be provided with a copy of the accompanying document specifying the Reid vapor pressure.

- 2) Maintain records for a period of two years on the Reid vapor pressure, quantity shipped and date of delivery of any gasoline or ethanol blends leaving the refinery or distribution facility for use in Illinois. The Agency shall be provided with copies of such records, if requested.
- i) Each retail outlet and facility operated by a wholesale purchaser-consumer shall, for a period of at least two years during the regulatory control period, maintain records regarding each delivery of gasoline, which shall include Reid vapor pressure, quantity received and date received. The Agency shall be provided with copies of such records, if requested.

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 13<sup>th</sup> day of September 1989 by a vote of 7-0.

  
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Dorothy M. Gunn, Clerk  
Illinois Pollution Control Board