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August 15, 1972

SUBJECT: LEAD IN GASOLINE

TO: BOARD OF DIRECTORS,
LEAD INDUSTRIES ASSOCIATION, INC.

Gentlemen:

Attached is a cover note and the contents of the Interior Department's position paper on EPA's recommended rule-making respecting lead in gasoline. We have sent this to all Members of Congress.

Cordially,

P. E. Robinson s/sh

Philip E. Robinson
Executive Vice President

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Att:

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N 3770

This is the official position of the Department of Interior in response to the general request for additional comments on the proposed regulations of lead in gasoline by EPA.

COMMENTS REGARDING PROPOSED RULE-MAKING ENTITLED "REGULATION OF FUELS AND FUEL ADDITIVES," AS PUBLISHED IN THE FEDERAL REGISTER VOL. 37, NO. 36, WEDNESDAY, FEBRUARY 23, 1972.

The proposed regulation makes compulsory the introduction of a 91-research octane number gasoline, free of lead and phosphorous additives by July 1, 1974, a program for lead content reduction in regular and premium gasolines and other regulations relating to service station dispensing of these fuels after that date.

Our comment relates principally to a matter of specific concern to this agency and of general concern to the nation as a whole. This concern is over the effect of the proposed regulation on usage of our natural resources, the consequent effect on national security, and its environmental impact.

It is almost universally recognized by qualified authorities that the nation is on the brink of an energy crisis which will be widespread, severe in its impact, and long in its duration.

Natural gas is being consumed more rapidly than new reserves are being discovered. Limitations on new consumers have already begun.

Although coal reserves are large, their development is hampered by high sulfur content. Development of coal gasification and liquification processes are a few years away from commercial development in significant volume.

Nuclear energy may ultimately provide an increasing proportion of our energy demand, but nuclear plants have been held up by siting problems, court cases, and environmental reviews. Little help can be expected from this energy source for the next few years.

In summary, the challenge to bridge this critical period in energy supply must be met by petroleum. Unfortunately, our domestic production of crude petroleum has about reached its zenith and will very likely slowly decrease henceforth, unless Government policies and industry reaction changes dramatically. Until that time, the answer is that increasing amounts of crude oil must be imported.

It is difficult to estimate U.S. petroleum requirements as far ahead as 1980 because of the great interplay of energy sources and other

However, efforts will have to be made to discover new reserves during this period at a much higher rate than in the past. The cost of imported oil is rising and will continue to do so. When the price of imported oil delivered to the United States approaches domestic crude price, there will be renewed incentives for increased exploration and drilling within the U.S. This will accelerate exploration and development drilling and production on the Outer Continental Shelf. While these activities can be conducted under careful regulation, they cannot be environmentally foolproof.

Although we have dwelt primarily on the matter of excess consumption of natural resources resulting from inefficiencies in new automobiles, there are related adverse side effects involving the U.S. balance of payments, an increased adverse environmental impact of greatly increased tanker and barge traffic in our harbors, and a weakening of national security due to increased dependence for raw material from distant and sometimes hostile countries. When these factors are added to the already widely discussed adverse effects such as higher cost of gasoline to consumers, higher cost of automobiles with new anti-pollutant devices added, higher investments in refineries and hardships imposed on small refiners and small marketers, it appears that the enormous total effect of all these factors warrants continuation of the use of leaded gasoline for the time being. This is particularly true in the face of the lack of any real proof that airborne lead has been detrimental to the public health and the lack of proven anti-pollutant devices to meet the post-1975 emissions standards at this late date.

The use of leaded gasoline could continue and at the same time permit establishing an emissions standard extremely close to the 1975-76 limits through the use of a proven thermal reactor. Automobiles so equipped could continue with high compression ratios thus saving the huge expenditures in money and resources described above. The relaxation from the 1975-76 standards level would be minute indeed, being equal to 0.29 grams of hydrocarbon, 6.6 grams of carbon monoxide, and one gram of nitrogen oxides, all per vehicle mile. This is illustrated below:

System Emission Levels
Grams/Vehicle Mile

	HC	CO	NOx
Pre 1968	17	125	10
1970 (*)	4.6	47	4
Thermal Reactor	0.7	10	1.4
	(95.9%)	(92%)	(86%)
1975-76 Limits	0.41	3.4	0.4
	(97.6)	(97.3)	(96%)

Percentages are reductions from pre-1968 levels.

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(*) Sun Oil Co. Testimony: EPA Hearings on Proposed Lead Regulations, Washington, D. C., April 11, 1972.

SUPPLEMENTAL MATERIAL
COMMENTS ON PROPOSED RULEMAKING
REGULATION OF FUELS AND FUEL ADDITIVES
ENVIRONMENTAL PROTECTION AGENCY
FEBRUARY 23, 1972

Gasoline Engine Efficiency and Fuel Economy

The relationships of compression ratio to octane number requirement and to unit fuel consumption per unit of work done has long been recognized by the industry. Although differences may exist between any two engines on octane satisfaction level even when they have the same compression ratio, there are unquestionably clear cut trends on an overall basis between the aforementioned variables. One such relationship is presented in Figure 1 which relates Research Octane Number to ton miles/gallon of work performed. This curve does not apply to any one engine but rather at any given point represents the fuel economy obtainable from an engine just satisfied by the Research Octane Number of that coordinate.

The nationwide average leaded pool research octane number (RON) is about 96.6[1]. In a general way it may be said to reflect the average octane level needed to satisfy the automobile population, at least through 1970. At this level on Figure 1 a performance of 52 ton miles per gallon at 40 mph is obtained. At the unleaded 91RON levels (proposed), a performance of 44.5 ton miles per gallon is obtained. This difference calculates out to about 17% more fuel to accomplish the same work in the case of the 91RON engine.

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(1) "Manufacturing Tomorrow's Gasolines," Stine, DeVeirman and Schuller, NPRA Annual Meeting, March 21-23, 1971.

considerable range varying from a minimum of 5% up to 40%. This fuel debit would be in addition to the extra consumption resulting from purely compression ratio/fuel economy relationships discussed above.

Crude Oil Consumption

The original Bonner and Moore report which was prepared for the Environmental Protection Agency was based on the use of 93RON unleaded gasoline whereas the proposed regulations call for 91RON. Because of this, and also as a result of a critique of the report by a joint API/NPRA task force,(5) Bonner and Moore(6) reworked their schedule to redetermine effects on investments, costs, construction and consumption of raw material. They report a 5.7% increase in crude oil consumption in 1980 as compared with the reference base. This increased consumption properly takes into account oil consumed as fuel in operations and production of utilities for the incremental operations. This percentage was used in calculating the 1,280,000 barrels per day mentioned previously. As a matter of interest, the API/NPRA group(5) without benefit of the Bonner and Moore follow-up study, had estimated an extra consumption of 1.5 million barrels per day by 1985 as a result of adopting the proposed regulations. Still a third party, Turner, Mason and Solomon,(7) have calculated a need for 6.9% more refinery raw materials by 1980 as a result of the proposed regulations and by 1985 the added need would be two million barrels per day, equal to all of the production projected to be obtained from the Alaskan North Slope.

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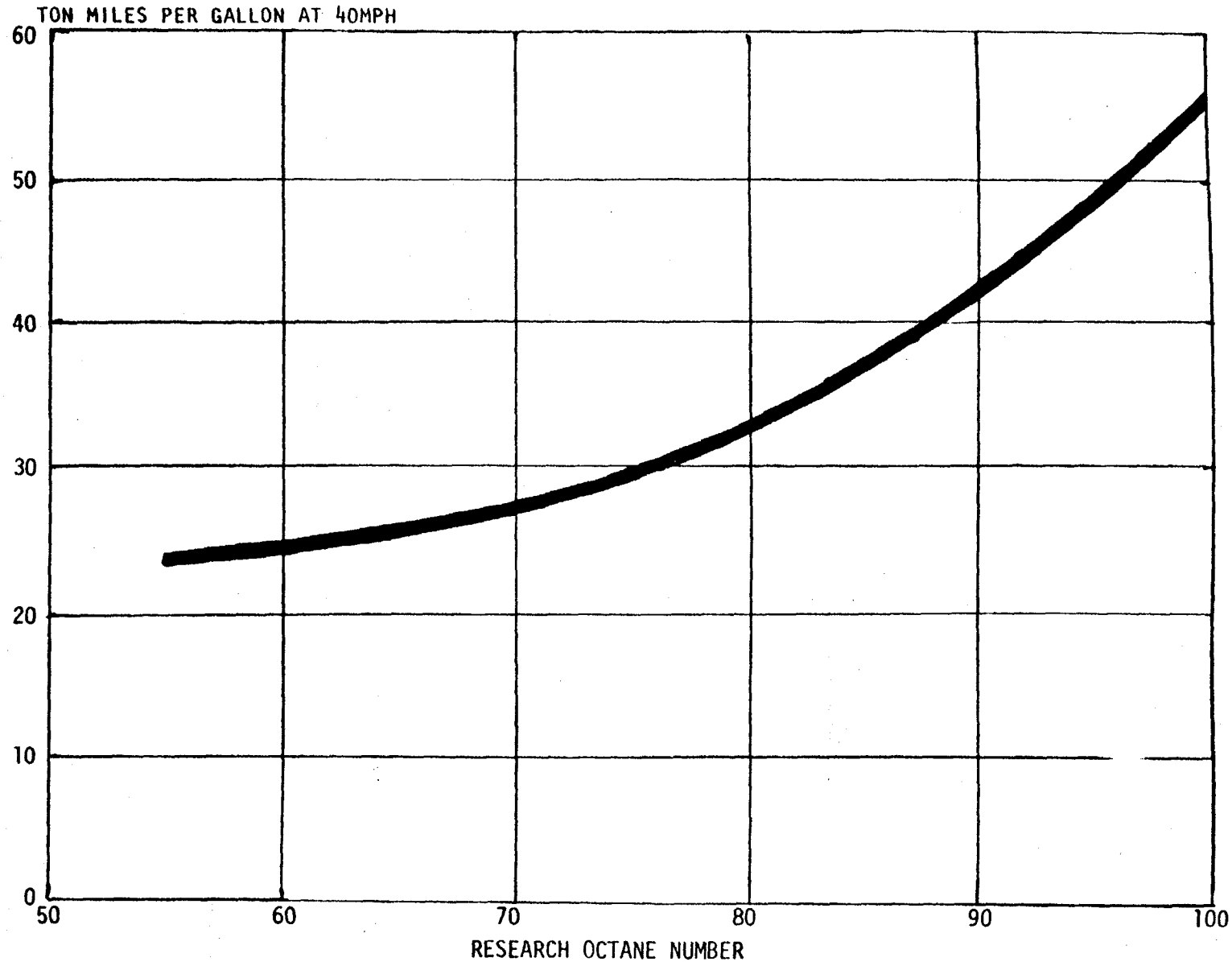
(5) A review of the July 1971 Bonner & Moore Report: "An Economic Analysis of proposed schedules for removal of lead additives from gasoline," October 1971, American Petroleum Institute, National Petroleum Refineries Association.

(6) "The Unleaded Gasoline Issue - its future and its lessons," J. F. Moore, NPRA Annual Meeting, March 26-28, 1972.

(7) Testimony of L. H. Solomon, EPA hearings on regulation of lead additives in Motor gasoline - Dallas, Texas, April 27, 1972.

ENGINE PERFORMANCE PER GALLON OF FUEL AT SPECIFIC OCTANE LEVELS



Source: Petroleum Processes and Profits, a History of Process Innovation
Prof. John L. Enes MIT p. 271, 1962

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FIGURE 1