

cc: Mr. C. C. Vogel
Mr. W. G. Ball, Jr.
Mr. Thom Yates
Mr. C. G. Krieger

ETHYL CORPORATION

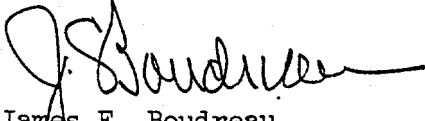
February 23, 1965

Memorandum to:

Dr. George F. Kirby	Dr. George Roush
Mr. William R. Perdue	Mr. F. P. Warne
Mr. R. K. Scales	Mr. Robert Herzog
Mr. H. E. Hesselberg	Mr. Davis Batson
Mr. M. P. Murdock	Mr. Carl Elliott
Mr. L. L. Huxtable	Mr. John C. Lane
Dr. R. A. Kehoe	Mr. Joseph Carter

Attached is a revised draft of the white paper on antiknock compounds. As many as possible of the comments and suggestions made by various of you gentlemen have been incorporated into this draft.

Sincerely,


James E. Boudreau

JEB:ir
Att.

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N 7186

Distribution:

S. M. Blitzner
J. E. Boudreau
S. Forbes
H. J. Gibson
J. Gill
H. E. Hesselberg
D. A. Hirschler
L. L. Huxtable
R. A. Kehoe
G. F. Kirby
W. B. Ligett
M. P. Murdock
C. M. Neher
F. Princi
S. T. Pruitt
K. Swartwood (3)
T. W. Warren

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STRICTLY CONFIDENTIAL

Detroit Meeting on
AIR POLLUTION PROBLEMS

October 24, 1961

Scope of the Problem

Mr. Murdock outlined the impact of the air pollution problem on Ethyl's sales position. He pointed out that this is the most serious problem we face. The situation in Southern California constitutes a threat to our whole antiknock market. If TEL is eliminated from gasoline in California other states may take similar action.

The immediate problem is to prevent restrictions on the use of TEL in the Los Angeles area. While legislation at a state level is a threat for the future, restriction in Los Angeles County could be imposed immediately. Mr. Griswold has been threatening to eliminate TEL on the basis that it interferes with the development of a satisfactory catalyst. We do not doubt his ability to enforce such a regulation.

Our West Coast customers have taken the attitude that this is a lead industry problem and they will not fight our battle for us. They would not like to see Pb eliminated, however, and they will cooperate with us. Standard of California in particular has a strong interest in keeping Pb in the picture.

The threat of Pb restrictions in Los Angeles County is so strong that some customers have already started to lower Pb concentrations in anticipation. This is documented in two attached tables supplied by Mr. Forbes. Mr. Murdock said that DuPont and Ethyl are both working on the defense of Pb and that we could not hope to gain any competitive advantage with customers through our efforts in this area.

Activities of WOGA

Mr. Huxtable said that the economics of removing Pb from gasoline will not prevent legislation. The APCD has asked the WOGA for information on the cost of supplying unleaded fuel. WOGA has taken the stand that this information is not available and that unleaded fuels are not necessary. Copies of APCD request and a draft of WOGA's proposed reply are attached. WOGA has not as yet approved this draft. It was the opinion of the group that while this answer is favorable to our cause it will be considered unsatisfactory by Mr. Griswold.

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Status of West Coast Anti-TEL Legislation

Mr. Hesselberg reviewed the October 10 Hearings. A separate report on this meeting is being prepared. At this meeting Mr. Brown, the sponsor of the California Assembly Bill AB2335, asked some questions on the public health aspects of TEL which for lack of time and other reasons Dr. Kehoe did not answer completely. It was agreed that it would be desirable for Dr. Kehoe to write an official answer to these questions and submit it to the Committee for inclusion in his testimony. It was further agreed that it would be desirable for Dr. Kehoe to personally talk with several of the Committee members. Dr. Kehoe agreed to be available for such discussions. Mr. Murdock will discuss the mechanism of setting up these meetings with Dr. Kirby.

It was the feeling of those present at the October 10 Hearing that we had little to fear from the public health aspects of TEL. It is Mr. Griswold's stand on the effect of TEL on catalytic devices which makes our position dangerous.

Economics of Removing TEL from Gasoline

Mr. Warren reviewed his study on the increase in cost to the refiner of marketing unleaded fuel of current octane quality. These costs would be in the neighborhood of 2.5¢/gal and would require an industry investment of \$228 M. If TEL content of 1 ml per gallon were permitted, the additional cost per gallon would be reduced to 1.1¢ and the capital investment would be only \$59 M. He expressed the opinion that these costs would be reduced over a period of time as competent people focus their efforts on technological improvements.

Status of Exhaust Catalyst Program

Mr. Hirschler reviewed our program to develop a catalyst which will operate satisfactorily on leaded fuel. Progress is being made and we are close to being able to meet present California standards. We have cooperative programs with several automotive companies and several muffler companies as well as CCI. Feed-back from these programs leads us to believe that no one is ahead of us. One of the most serious problems is attrition and we have reason to suspect that TEL promotes attrition as well as reducing catalytic activity.

Dr. Neher briefly reviewed an economic analysis he has prepared. Copies are included in this package. He stressed two points.

1. If catalyst life could be extended from one year to two years by use of unleaded fuel the annual cost for catalyst would be reduced by \$20.00. This is approximately equal to the additional fuel cost per year (2¢ per gallon for 1000 gallons of unleaded fuel).

2. His recommendation that we proceed with an accelerated catalyst development program.

Neat Manganese as an Antiknock

The question has been raised as to the possibility of selling AK-33X for use in fuel if TEL is eliminated. Mr. Gibson said that 1 gm of Mn (4 gm of AK-33X) would give Δ RON equivalent to 2.0 ml of TEL. Δ MON for this concentration would be about half what could be obtained from 2 ml TEL. One gm of Mn is the top concentration which could be considered from a durability standpoint. This amount of Mn would probably be tolerable in passenger cars although there would be some loss of spark plug life. In heavy-duty trucks spark plug life would be very poor. This type of spark plug failure would raise emission level throughout the whole range of engine operating conditions. Mr. Griswold might raise serious objection to use of Mn since it is reported to increase the rate at which SO_2 is converted to sulfuric acid in the atmosphere. In view of these problems Mn does not appear to be a practical substitute for lead.

Activities of Automotive Companies

Mr. Scales reported on his contacts with the major producers of automobiles.

Both GM and Ford think that catalytic mufflers are a poor solution to the emission problem because they would be very expensive and therefore politically unpopular. They are focusing their attention on reducing emissions to an acceptable level by changing engine design. A catalytic muffler which would sell for \$200.00 would cost \$50.00 at the factory. They feel that for \$50.00 a great deal can be done with the engine. They feel that whoever can solve this problem through engine modifications will have a real competitive advantage. Therefore they have sizeable (\$1,000,000 per year) programs under way.

They were of the opinion that Ethyl could not afford to abandon the catalytic muffler approach at this time, however, Furthermore, they have no interest in seeing TEL removed from gasoline and offered cooperation in our efforts to prevent this.

GM will present a paper at the SAE Passenger Car Meeting in March which will imply that they feel engine modifications are the best approach. They suggested that Ethyl present a discussion which would say in effect that we think both approaches are worthwhile.

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Contacts with California Manufacturers Association

Mr. Gill reported that the California Manufacturers Association was sympathetic to our interests and have cooperated to some extent with us. They will take an active interest at the state level but not at the county level.

Specific Action

With the above background three general areas were explored for the purpose of making specific recommendations as to actions which Ethyl Corporation should take.

1. Research and Development
2. Medical
3. Public Relations

Recommendations for R & D Program

1. The group was unanimous in the opinion that our catalyst program should be continued and accelerated. It was agreed that this program is buying us time with Mr. Griswold. If we were to abandon it at this time he would say that even Ethyl Corporation had no hopes for solving the catalyst problem with leaded fuels and he would likely initiate action to eliminate lead from gasoline in Los Angeles County. No one doubted his ability to push this through in short order.
 2. Immediately begin to develop data on the role of TEL concentration on the performance of our catalyst. While Griswold makes general statements on the reduced efficiency of catalytic devices operated on leaded fuels versus clear fuels, we doubt that any actual sound data exists. It is to be expected that catalyst performance will be influenced by TEL content, however. This effect may well be much less than Mr. Griswold implies.
 3. In order to accelerate our program on catalysts we should purchase two additional vehicles and increase manpower devoted to this program by \$50,000 per year.
 4. Continue and expand if possible our cooperative programs so that chances of developing a satisfactory device for use with leaded fuels are increased.
 5. Carry on some basic studies of the potential improvements from engine modifications. Any help that we can give automotive companies should be provided.
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6. Mr. Warren raised the point that removal of sulphur from West Coast fuel might help as much as removing TEL and that it would be more attractive to refiners. This will be considered further.
7. Mr. Blitzer put forth some suggestions as to how Baton Rouge might contribute to this program. These ideas are outlined in an attached memorandum, and they will be considered.

Recommendations for Medical Program

Dr. Kehoe and Dr. Princi will work out a program designed to educate and influence opinions of medical people and the public. It is our opinion based on a considerable background and an impressive amount of data that the use of leaded fuels does not pose any threat to public health. Data that the various public health services are now gathering are confirming this conclusion. We do have to combat a general lack of information and considerable misinformation on the part of both the medical profession and the public.

A number of specific items which were recommended for serious consideration are listed below.

1. Obtain the services of a medical consultant in the Los Angeles area to keep us advised of developments and to recommend appropriate action.
2. Publications in California Medical Journal which would educate general practitioners who influence public opinion to a considerable extent.
3. An educational medical movie which might be sponsored by a university group which would be used in Medical Association meetings and in Medical Schools. This would probably cost \$50,000 to \$75,000.
4. Hold a workshop meeting for medical people.
5. Direct contact with doctors who write daily articles for the public press.

In addition to the above educational program, we should develop further information on lead compound size distribution and composition in the atmosphere since this question of body retention versus particle size, as well as specific lead compound composition, appears to be assuming major proportions. We have adequate knowledge what is in exhaust gas and we know the relationship between particle size and body retention. What we must investigate is particle size and composition in the atmosphere. Ethyl and DuPont are jointly looking into the best way to conduct this program.

Recommendations for Public Relations Program

Mr. Boudreau outlined a Public Relations program which everyone agreed was desirable. The immediate need for this program is in California but long range it will be valuable throughout the U.S. In spite of the medical, technical, and economic facts involved, we are at the mercy of politics and public opinion. The best way to protect ourselves is through an effective Public Relations Program.

Some of the essential elements this program and some specific items for action agreed upon are listed below:

1. Mr. Murdock said that he would recommend to Mr. Turner that a Project Manager be appointed to direct this effort and that this man should report directly to Dr. Kirby.
2. Mr. Boudreau felt that a first step would be to set down our objectives in a written statement.
3. Mr. Boudreau also recommended that a fact sheet be assembled which would be kept up to date on a day-to-day basis which would be a central source for all pertinent information.
4. The public press should be contacted, cultivated and supplied with background, press releases and stories. The same treatment should be given to trade journals and radio news people. Publicize our progress on a catalytic device.
5. Mr. Boudreau's group in New York should do all of the writing and preparation of releases.
6. Mr. Boudreau will visit the West Coast to find a suitable Public Relations firm or individual to advise us on the California program and perhaps to help with contacts.
7. Mr. Huxtable submitted for consideration a suggestion by George Unzelman that a film be produced for public education. A copy of this memorandum is included.
8. As an interim measure, Ethyl might sponsor a tune-up campaign in Los Angeles which would have an immediate beneficial effect on emissions. This would be designed primarily to soften up Mr. Griswold by demonstrating our desire to cooperate with him in solving the smog problem.

9. Mr. Huxtable will contact Mr. Fred Warne and ask him to make Mr. Schults a specific offer to represent us as a lobbyist in Sacramento.
10. Mr. Hesselberg will contact Mr. Jerry McAfee to find out what we can contribute to his API committee (Air and Water Conservation).
11. Mr. Murdock will set up a meeting with American Oil Company to brief them on the West Coast Air Pollution situation. Since they are new marketers in California, they have asked for our background. We will also encourage them to join WOGA.
12. Included is a letter from Standard of California suggesting what the lead additive industry should be doing in regard to the smog situation. The group discussed these suggestions item by item and made the following decisions.

Health Aspects

- Item 1. As previously discussed in these notes, Dr. Kehoe will officially and personally do what is required to clear up any questions which the Committee members may have.
- Item 2. Ethyl and DuPont are planning a cooperative study of the type suggested.

Effects of Lead on After-burner Catalyst Life

- Item 1. We do not feel it would be wise to challenge Mr. Griswold to produce data. It would only alienate him. We will get our own data.
- Item 2. We have contacted all of these people except UOP and no one has any data. We suspect that UOP may be the source of some of Mr. Griswold's anti-lead information. It would seem that UOP has a large incentive to see lead removed from gasoline.
- Item 3. We are going to test our own catalysts at reduced lead levels.
- Item 4. Since we feel that lead does have an adverse effect on catalyst life, we will not participate in any cooperative tests until we have our own answers.

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LOS ANGELES

	<u>Mobil Oil Co.</u>		<u>Richfield Oil</u>		<u>Shell Oil Co.</u>	
	<u>Prom.</u>	<u>Reg.</u>	<u>Prom.</u>	<u>Reg.</u>	<u>Prom.</u>	<u>Reg.</u>
Mar. 1958	2.11	1.02	2.52	0.74	2.91	1.51
June	2.76	0.80	2.44	0.20	2.91	0.37
Sept.	2.45	1.50	2.69	0.23	2.31	0.90
Dec.	2.85	1.31	2.99	1.43	1.56	1.97
Mar. 1959	2.76	1.14	2.84	1.72	1.61	0.86
June	2.85	2.63	2.92	2.49	2.05	1.37
Sept.	2.83	1.65	2.13	2.19	2.43	1.73
Dec.	2.64	1.07	2.32	2.49	2.54	1.47
Mar. 1960	2.95	1.21	2.54	2.20	2.71	1.01
June	2.87	1.95	2.76	2.47	-	-
Sept.	3.02	1.39	2.98	2.56	-	-
Dec.	3.06	1.35	2.39	2.03	2.35	2.51
Mar. 1961	2.73	0.84	2.23	1.03	2.57	1.30
June	2.02	2.35	2.21	0.83	-	-
Sept.	1.89	1.08	1.83	0.81	2.65	1.89

8 BRAID TEL CABLES

<u>Std. of Cal.</u>		<u>Tenneco Inc.</u>		<u>Widewater Oil</u>		<u>Union Oil Co.</u>	
<u>Prom.</u>	<u>Reg.</u>	<u>Prom.</u>	<u>Reg.</u>	<u>Prom.</u>	<u>Reg.</u>	<u>Prom.</u>	<u>Reg.</u>
1.69	1.11	2.89	1.60	2.89	2.48	2.84	1.73
2.63	1.08	2.95	2.03	3.04	1.41	2.90	2.18
2.92	0.62	2.93	2.32	2.98	1.80	2.88	1.89
2.54	1.50	2.99	2.11	2.99	1.46	2.63	2.27
2.60	2.55	2.93	1.30	2.95	1.71	2.90	2.35
2.69	1.26	2.85	2.19	2.87	2.65	2.70	2.87
1.97	1.94	2.86	2.24	2.98	1.99	2.74	1.28
2.34	1.07	2.95	1.75	2.98	1.33	3.21	3.01
2.36	1.39	2.21	1.97	2.89	2.59	3.21	2.65
2.00	1.61	2.80	2.86	2.79	2.11	3.05	2.99
2.13	0.93	3.09	1.52	2.95	1.97	3.25	2.85
1.89	0.94	2.94	2.76	3.15	1.32	3.32	2.76
2.39	1.05	2.69	0.80	2.57	0.84	1.62	2.04
2.61	1.91	2.20	2.50	2.16	1.23	2.25	1.69
1.68	1.45	2.83	2.06	2.16	1.99	2.09	1.30

U. S. POOL TEL CONTENT

	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>
Jan.	2.11	1.82	1.85	1.79
Feb.	2.08	1.81	1.86	1.79
Mar.	2.09	1.86	1.88	1.78
Apr.	2.06	1.98	1.94	1.79
May	2.05	2.06	1.96	1.90
June	2.05	2.03	1.96	1.97
July	2.03	2.10	1.99	1.97
Aug.	2.00	2.06	2.07	1.99
Sept.	2.07	2.04	2.02	1.93
Oct.	2.05	2.02	1.97	1.88
Nov.	1.93	1.91	1.91	
Dec.	1.84	1.88	1.83	

LOS ANGELES POOL TEL CONTENT

Jan.	2.08	2.25	2.37	2.22
Feb.	2.05	2.36	2.12	2.09
Mar.	2.02	2.32	2.35	2.05
Apr.	2.05	2.49	2.31	2.05
May	2.03	2.49	2.38	2.09
June	2.08	2.47	2.50	2.12
July	2.29	2.40	2.55	2.36
Aug.	2.13	2.48	2.51	2.14
Sept.	2.20	2.14	2.35	2.01
Oct.	2.15	2.48	2.38	2.12
Nov.	2.38	2.35	2.26	
Dec.	2.34	2.37	2.31	

LOS ANGELES POOL AS % OF U.S. POOL

Jan.	98.6	123.6	128.1	124.0
Feb.	98.6	130.4	114.0	116.8
Mar.	96.7	124.7	125.0	115.2
Apr.	99.5	125.8	119.1	114.5
May	99.0	120.9	121.4	119.8
June	101.5	118.8	127.6	107.6
July	108.4	114.3	128.1	119.8
Aug.	106.5	119.2	121.3	107.5
Sept.	106.3	104.9	116.3	104.1
Oct.	104.9	122.8	120.8	112.8
Nov.	123.3	123.0	118.3	
Dec.	127.2	126.1	126.2	

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