

June 17, 1958

Lt. Colonel Donald S. Myers, MC
Preventive Medicine Officer, (TACPM)
Headquarters
United States Army, Alaska
APO 949
Seattle, Washington

Dear Colonel Myers:

Dr. John Phair, Professor of Preventive Medicine, and one of my associates in this Department, has referred your letter of June 9th to me for reply.

I shall reply directly to certain of your questions, and forward to you, under separate cover, certain items of information. Unfortunately not all that you wish to obtain is available in wholly satisfactory form, but I shall see that certain additional items of information are sent to you by Mr. H. K. Ball from the New York office of Ethyl Corporation.

I believe it is fair to say that Ethyl Corporation, through its Medical Department and the Product Service Division of its Sales Department, has made every possible effort, for many years, to reach all of the responsible people in the military services with full information on the matters which you have queried. For some reason, unfathomable by me, we have not been able to arrive at any suitable arrangement with the Army, but we have met on several occasions with the technical people and the chief medical officers from all of the Air Force base headquarters, and I believe there is no such base at which the responsible people lack detailed information. It would be highly desirable if the same thing could be accomplished for all of the Army bases, and I mention the matter here in the hope that it might be possible for you, and perhaps others in the service to raise this issue. We would go to a great deal of trouble to put on a three - or four-day session of instruction at some appropriate time and place where a group of medical officers and technical personnel (the appropriate people from various headquarters) could be brought together. This would save a great deal of trouble and expense and, in all probability, some lives.

Perhaps I should explain that I retired from the Medical Directorship of Ethyl Corporation last December, after having held that position from the time of the organization of Ethyl Corporation. At the same time, I have continued in my university position as the Director of this Laboratory and Department in this Medical School (the two posts, of course, were independent of each other, but were not in conflict, and they were, in a sense functionally related, since this Laboratory since 1925 had done all of the major clinical and toxicological work on tetraethyl lead.) I continue, for the present, as a medical consultant to Ethyl Corporation, and therefore

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I can call upon Mr. Bail and others, who will be only too glad to contribute anything they can to the solution of this problem.

With these preliminary remarks behind me, I shall deal with your questions.

First, with respect to the diagnosis and therapy of tetraethyl lead poisoning. I shall get together, for you, what I can. Unfortunately, however, the articles published on this subject have been unavailable in reprint form for years, having had a very wide distribution years ago. I will have to get copies reproduced for you. (No publications on this subject have come out of the Taft Sanitary Engineering Center.)

Second, let me say categorically, that there is no danger, from the aspect of tetraethyl lead poisoning, in association with the ordinary handling of leaded gasoline in mobile equipment, pipe lines or from dispensing equipment.

Third, the danger involved in the cleaning of tanks that have been used for the storage of leaded gasoline, is of a very extraordinary type, unlike anything else in the handling of this fuel. I cannot go into detail here in describing or explaining it, but the problem lies in the sludge that forms under the water bottom. In fact, but for the presence of the water bottom there would probably be no problem, for this accumulation of degradation products of tetraethyl lead in the water layer under the gasoline is the basis of the problem.

When men enter a tank that has been freed of gasoline, for all practical purposes, organic lead compounds, including small quantities of tetraethyl lead remain behind, in the sludge, and from this sludge the vapors of lead compounds escape and contaminate the air. On this account, any man, who enters a tank that contains water and sludge, or a slurry of sludge, may be subjected to respiratory exposure to these organic compounds of lead, with disastrous results. Therefore, so long as any sludge remains in the tank, men who enter the tank must be completely protected by air-line, positive pressure masks with hose lines. To avoid contact of the skin with the sludge, they should also be clothed in clean coveralls, or the equivalent, so that contamination of the clothing can readily be recognized and a change in clothing effected if necessary; they must also wear impervious boots and gloves in perfect condition. Good supervision, of course, is necessary, and proper provisions for rescue, in case of any accidental difficulty, should be established. If these precautions are followed properly, in relation to tank-cleaning, no one will come to grief. On the other hand, under the worst conditions that have been known to exist within such a tank, fatal poisoning has resulted from one hour of exposure in the absence of respiratory protection. The conditions in tanks vary, and one cannot predict when they will be at their worst, and therefore, one must always guard against the risk. Our cases of poisoning have occurred when some responsible person has failed to see that these precautions were

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taken, or when some one assumed that there was little or no danger in a given situation.

When the sludge has been removed completely, and all of the surfaces of the tank, on critical inspection, are found to be clean, persons may enter without respiratory protection.

Fourth, in answer to your question # 3, information will be supplied in the form of printed material.

Fifth, with respect to your question # 5, you will be better able to handle the safety of your personnel if you put no dependence on analytical equipment, with respect to lead in the atmosphere of tanks. When any and all sludge (which may contain tetraethyl lead or will certainly contain some triethyl lead [needle-shaped crystals] compounds) has been removed from the tank, and when all adherent scale (containing decomposition products of tetraethyl lead) have been removed from the side walls, the tank may be said to be clean. In general, "lead rust" as you call it, will not be dislodged readily by air currents, for the lead-containing scale on the sides of tanks, is adherent. It will be volatilized by the heat of a blow-torch, and it will be dislodged as dust if brushes or scrapers are used on the side plates, and therefore men should have respiratory protection in any of these operations. If no repairs are made, however, the thin layer of adherent lead-containing scale on the side plates is harmless since the lead compounds therein are not volatile at ordinary ambient temperatures.

As to your question # 4, the use of the "explosion meter" or other means for checking the significance of gasoline vapor, is optional and has nothing to do with tetraethyl lead. Moreover, air free of the vapor of gasoline is not necessarily free of tetraethyl lead. No assumptions should be made, therefore, with respect to safety from exposure to lead, from determination of gasoline vapor in air. It is not safe, from the aspect of exposure to lead, to enter a tank that is free of gasoline vapor.

With respect to your preparation of instructions, I should not, if I were you, be too much concerned. The solution of your problem in connection with tank-cleaning (which is the only problem about which you need be concerned) lies not in information in headquarters files, but in hard and fast discipline and supervision at the point at which a tank is being cleaned. If the simple precautions which we have advised are actually followed, you will never see a case of tetraethyl lead poisoning, nor will you have occasion to treat such a case. I suggest that you organize the activities in this connection in such a manner that there will always be an informed person on the job when a tank or a series of tanks are to be cleaned. While I sympathize deeply with your interest in knowing all the facts (and I will do what I can to satisfy your interest), it is not detailed knowledge, but adherence to simple but rigid procedures of safety, that will eliminate this trouble.

Sincerely yours,

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cc: Dr. K.V. Kitzmiller
Mr. H.K. Bell

Robert A. Kehoe, M.D.