

December 23, 1940

Memorandum for Tank Cleaning File

Anent the matter of what constituted a clean tank, data from the two samples of Mr. Siebenthaler are appended.

It should be noted that only high pressure water was used in cleaning the tank and the amounts of material, namely 81 grams of scale and 235 grams of sludge, are within reasonable limits of what one might expect after such a cleaning operation.

The concentrations of organic lead were low in both instances and it is worth noting that the absolute amounts of organic lead in the scale were less than 0.2 mg. in the entire 100 sq. feet of surface and about 1.3 mg. from the entire 100 sq. feet of bottom plate. These are less than the amounts necessary to create unsafe concentrations in 10 cu. m. of air.

Looking at the results another way, 200 times the amounts of organic lead found in these samples have been obtained in samples from other tanks and in one instance 1,000 times these concentrations were encountered. Therefore, slightly more than 1 gram of lead might be present under exceptional circumstances in the amounts of sludge left remaining after thorough cleaning on 100 sq. feet of tank space. Assuming that all of this were to evaporate into an enclosed place without ventilation, lethal exposure could be gotten in one day's work. This situation would probably be possible only in a small tank, for example, a 10' x 30' with a single top manhole.

In the case of larger tanks with more than one opening, any movement of air would of course tend to reduce the concentration.

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From the present state of our knowledge then there is a possibility that in about 1 in 100 or more tanks a situation could occur in which the tank was thoroughly cleaned and then closed and allowed to stand for days or weeks, at the end of which time, men would enter the tank for purposes of repair and be poisoned. A large number of conditions, such as the above, would have to be met, particularly the ones specifying complete absence of ventilation and full day's exposure under identical conditions, and probably more importantly, a rate of volatilization of organic lead from the sludge sufficiently rapid to effect saturation in the time allotted. This would occur probably only if the organic compounds were pure tetraethyl lead and they did not undergo any decomposition in the period of standing. In line with this, it would be advantageous to know the rate of evaporation of organic lead from sludge and the influence of ventilation on this. Work on this is now in progress.

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