

June 1, 1948

Circular Letter No. S-21-48

Subject: Sludge Study

Reference: Safety Manual
Section XII

TO OPERATION MANAGERS

COPY FOR Dr. Kitchin

Gentlemen:

The paper on "Decontamination" distributed last year mentioned that buried material contaminated with organic lead compounds should not be disturbed. No mention was made of a time factor. In normal tank cleaning operations, sludge and scale are buried near the tank. Occasionally areas where such material is buried must be disturbed to lay lines or perhaps to bury another accumulation of sludge and scale. It is desirable for us to be informed of the rate of change in lead hazard created by this material and if possible to know how long such material must be buried to eliminate the lead hazard if, in fact, it can be eliminated at all.

It may be assumed that the hazard will be proportional to the quantity of organic lead material present. Since there is no valid reason to assume that any organic lead products in the tank will be evenly distributed throughout the sludge, sampling must be done in a very careful manner. Successive quartering would be the ideal method of sampling, but it is not practical. A large number of small samples, collected from well scattered points, will approach the results of successive quartering for a representative sample. The scattered points should be weighted according to the apparent mass distribution of the sludge and scale in the tank; that is, more small samples should be taken from large piles of sludge and scale than from areas relatively free from such material. For this reason, when the tank is safe for entry, the sample should be collected before workmen enter the tank to remove sludge and scale. The total volume collected should be one quart. A clean mason jar with glass top will be a satisfactory container.

The following data should be obtained for each tank sampled:

1. Tank service
2. Time last cleaned
3. Thoroughness of last cleaning

4. Estimated through-put
 - a. Product
 - b. TEL
5. If a mixing tank, any record of lead discrepancies in mixing.

The following factors will influence the regression rate from organic to inorganic forms of lead:

1. Use of decontaminating agents
2. Characteristics of soil
 - a. pH (acid, alkaline, neutral)
 - b. Porosity (rocky, clay, sand, loam)
3. Drainage
4. Amount of precipitation and surface water flowing over the area
5. Depth of sludge beneath surface
6. Winter and summer temperature of soil at depth of buried sludge.

The foregoing discusses action necessary when sludge is buried at the time of tank cleaning.

The quart sample, properly identified, should be sent to Kettering Laboratory, attention of Dr. R. A. Kehoe. Copies of the report form (sample "A" attached) should be sent to Dr. Kehoe and to the New York Office.

Subsequent samples should be collected at six month intervals until the lead hazard ceases to exist. Again sampling must be done carefully in order to have material representative of the whole amount of sludge. A large number of small samples, totaling one quart should be taken from random locations throughout the body of sludge. Reports (sample "B" attached) accompanying these samples should identify the tank, the date the sludge was buried originally, the amount of rainfall or snow during the last six months, any unusual circumstance that might influence the regression of organic lead materials.

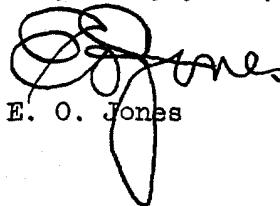
It is desired that each region take samples in accordance with the above procedure at 25 different locations. These locations should be selected to give the widest geographic distribution possible.

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It is possible that samples can be collected immediately of sludge that has been buried for a considerable period of time where the safety engineer has knowledge of its location, date buried, etc. Analysis of these samples will provide valuable information when correlated with the factors influencing the change of organic lead compounds as previously described. This information can be given on the form used for original samples with suitable comments under "Remarks".

It is desired that this study be started as soon as possible. Your cooperation in the careful planning, follow up of the details involved, and collection of representative samples, will be appreciated.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'E. O. Jones', with a large, stylized flourish extending from the bottom.

E. O. Jones

Attach. (2)

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SLUDGE SAMPLE REPORT

(First Sample)

Date _____

Tank Owner _____ Tank Location _____

Tank Service: (1) Mixing _____, (2) Storage _____.

Tank Last Cleaned _____ Thoroughly Cleaned: Yes _____ No _____

Estimated Throughput: (1) Product _____ bbls. per year

(2) Average TEL _____ ml. per gallon

Record of mixing discrepancy in this tank _____

Were decontaminating agents used at time sludge was buried? Yes _____ No _____

Type Soil: Acid _____ Alkaline _____ Neutral _____

Porosity of Soil: Rocky _____ Clay _____ Sand _____ Loam _____

Does most surface water drain off _____ or soak through ground _____

Amount of annual precipitation in general area: Rain _____ inches/year

Snow _____ inches/year

Is there any general flow of surface water from other sources flowing

over area? Yes _____ No _____

Average ground temperature at depth of sludge: Winter _____ Summer _____

Remarks: (Describe any condition, not covered above, that may influence
the conversion of organic lead to inorganic lead compounds.)

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SLUDGE SAMPLE REPORT

(Follow up Sampling)

Date _____

Tank Owner _____ Tank Location _____

Date Sludge Buried _____

Precipitation Since Last Sample Collected: Rain _____ inches

Snow _____ inches

Remarks: (Describe any unusual condition that may have influenced conversion of organic lead to inorganic lead compounds.)

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