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April 20, 1977

COMMENTS RE: "EXPOSURE TO INDUSTRIAL TALC IN VERMONT MINES AND MILLS"
Draft #1 of March 15, 1977

GENERAL

This draft report contains considerable data on talc worker dust exposures, but it fails to develop the overall significance of this information in practical terms which would be most useful to Engelhard as the operator of one of the plants under study. Dust exposure levels, measured in respirable mass concentrations, cannot readily be related to applicable workplace TLV's which are currently expressed in midget impinger particle counts. It would, moreover, be helpful to qualify the observed level of exposures in broad terms, i.e., how they compare with levels of other (nuisance) dusts in similar non-metallic working operations.

The dust characterization information is, however, enlightening. It confirms our own observations and strengthens our conviction that for talc dusts, phase contrast microscopy is so unreliable that it should be replaced by scanning electron microscopic techniques.

This draft report covers only one of the three inter-related aspects of the general study of the Vermont talc industry which NIOSH undertook in 1975, namely the amount and type of personal dust exposure experienced by the industry's employees. The other phases of the general study, viz., the morbidity and mortality investigations, are yet to be reported, although NIOSH released some preliminary epidemiological findings in October, 1976.

In commenting on the industrial hygiene draft report, we are handicapped by not knowing how this dust information relates to (or affects) worker health, since the results of the other two phases of the overall study are not yet available to us. It is appropriate, therefore, to question what is to be gained by

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publishing the industrial hygiene information before its impact on the degree of health risk, if any, has been established. We recommend this paper not be presented as planned at the American Industrial Hygiene Association Conference next month.

Page 1

Line 11 *Correct the spelling of "Mineralogy"*

Line 12 *The preferred theoretical formula for pure talc is* $3MgO.4SiO_2.H_2O$.

Line 25 *Although we agree that the proportion of pure talc mineral may vary considerably among the many commerical forms of industrial talc which are mined throughout the world, we are by no means certain that it ever reaches zero, as this sentence would imply.*

Page 2

Line 2 *Delete the word "since", inasmuch as the occurrence of talc in compact lenses is not the reason why inclined shafts are sunk to mine the deposits.*

Line 6 *Delete "from the surface", exploratory drilling is also done from underground.*

Line 9 *Delete "and stoping methods."*

Line 22 *Delete "air", since some locomotives are powered by other means, e.g., battery.*

Page 3

Line 4 *Delete or modify reference to "mechanical drag shovel", inasmuch as not all mill operations utilize such equipment.*

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Line 18 — Delete the sentence "The bubbles.....surface" and substitute "The naturally hydrophobic talc becomes attached to the air bubbles and rises to the surface as a mineralized froth."

Page 4

Line 17 — Correct spelling "send" to "sent"

Page 7

Lines 17, 18 & 19 — The comments relative to poor housekeeping and machinery breakdowns are subjective, and we do not believe they are substantiated by fact. The observed differences in dust concentrations could well result from the fact that our milling equipment is quite a bit older than other companies, and probably less tightly constructed.

Line 34 — Correct spelling of "coursest" to "coarsest"

Page 8

Line 10 & 11 — It is very unlikely that only a portion of the bags in use at a given time will have valve or seal deficiencies. We suggest inserting after the word "that" the following: "These bags may have had an inefficient valve and seal."

Line 24 — Add the following sentence - "According to the NIOSH Manual of Analytical methods the IR method (P&CAM #110) has a standard

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deviation of ± 11% and an accuracy from test to test of ± 30% at the 15 µg level, while at the 30 µg level the x-ray method (P&CAM #109) has a standard deviation of ± 15%."

Line 27 All of the respirable quartz concentrations listed in Table 6 are below the present free silica TWA of 100 µg/m^3. It would seem more meaningful to make this observation than to compare the measured quartz concentrations with the NIOSH recommended TWA of 50 µg/m^3.

Line 33 The symbol following 54.7 contains a typographical error and should be "µg/m^3."

Page 11

Line 24 We would suggest adding a more positive recommendation as follows: "and should be considered as an adjunct to or replacement for the phase contrast techniques."

Page 12

Line 11 & 12 Is it not possible that the occurrence of single chrysotile fibers reported in samples A-77 and A-80 actually resulted from background interference? This point should be clarified before the statement is included in the report.

Page 13

We recognize and appreciate the inadequacies of midget impinger counting techniques for measuring personal talc dust exposures, but we must rely on this method in our operations because the present TLV's are expressed in these terms. This report

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has indeed "quantified" respirable talc exposures during the two brief observation periods in 1975 and 1976, however only in terms of respirable mass concentrations. It is most unfortunate that insufficient comparisons were made to develop a meaningful correlation between midget impinger counts and respirable mass concentrations. Thus, the question as to whether our operations are in compliance is left unanswered. Although we believe this to be the case on the basis of our own measurements, this report fails to confirm it, and we are disappointed that it is not made clear from your findings, and the reader may be left in doubt on this important matter.

Table 7

We presume the column headed "All Fibers" lists observations made by SEM of the Nuclepore filter samples without the minimum length restriction. The column heading should be amended to clarify this distinction.

Table 9

What is to be added to this table when it is expanded?

Our laboratory reports some evidence that the magnesite contained in our talc samples may actually be breunnerite, a mixed magnesium-iron carbonate solid solution.

Table 10

The title should be amended to indicate that the data represent mass area samples rather than personal samples, as reported on all other tables referring to respirable dusts.

CYH/bp

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