

INTERNAL CORRESPONDENCE

METALS DIVISION

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To (Name) Mr. J. L. Myers
 Division UCC - Metals
 Location Niagara Falls, NY

Date February 19, 1980

Originating Dept. "Calidria" Asbestos

Answering letter date

Copy to Messrs.
 T. W. Carmody
 W. B. DeAtley
 K. S. Lane
 P. W. McDaniel
 O. J. Malacarne
 R. W. Rebholz
 J. J. Sibley/R. F. X. Fusaro

Subject Review of King City Plant
 Monitoring and Medical
 Records

This letter summarizes the status of the above-noted project following meetings at King City and with Dr. Lane and Mr. McDaniel in New York City.

The monitoring data files at King City have been assembled in one place. We have exposure information going back to 1963. The early data are by midget impinger and are sporadic in today's terms, but at least a modest number of facts seem to be available. Personal sampling started in 1970 and sampling detail, frequency and scope has increased substantially since that time. Examples of this type of data available at various points in time are attached for reference.

It also appears that Dick Marsden has good chronological records of changes that have been made in the plant equipment. These include changes affecting the levels of asbestos dust so we should be able to relate the changes to the observed levels of airborne asbestos dust.

The information available to relate workers to job locations is very extensive. Weekly time cards which show the hours spent in each plant department appear to be available for everyone who has ever worked in the plant. Examples of these cards are attached for reference. Medical records are also available for all past and present employees.

Based on this information two projects can be defined:

1. Summarize the exposure data and relate it to the corresponding changes made in plant equipment to reduce dust levels.
2. Put the exposure and work location information in a form where exposure histories and cumulative exposure can be obtained readily for each individual employee. This is obviously a computer program and storage task. Medical records would also be coded for prompt recall.

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Regarding the first of these tasks, there are about 16 plant locations that are now monitored with some regularity. A substantial proportion of these have been tested to some extent back to 1963. Since monitoring seldom occurred more than once a month and often only once or twice a year, it is a substantial but still manageable task to prepare a graphical summary by month of all of the daily TWA data.

Bill DeAtley is now preparing such a summary. The mechanical changes relating to dust levels from Dick Marsden will also be shown. When completed, we will have a good historical picture of our efforts to control exposure and the results achieved. It will also show clearly the amount and kind of exposure data available.

The second task relating to individual exposure and medical histories is much more substantial. For epidemiology it would be most desirable to relate the time spent by each employee in each location to the corresponding exposure records to give a cumulative exposure. It appears that our ability to relate time-in-location far exceeds our ability to estimate exposure. Nevertheless, it appears that the total amount of information available substantially exceeds that used in most asbestos epidemiological studies published in the past.

It is well recognized that asbestos related diseases generally take a minimum of twenty years to develop and the latency period can be much longer than this for low exposures. Also, out of approximately 200 past and present employees at King City, only five have as much as 16 years exposure.

The medical records show no evidence of asbestos related disease. It can be concluded that the cohort here is too small and the exposure period has been too brief to make an epidemiological study worthwhile at this time.

On the other hand, however, there are several good reasons to put the data in "epidemiology" form now and store future data in the same form. These include:

1. In order to protect our employees it is very desirable to know their exposure history and cumulative exposure. Recent literature is providing estimates of risk based on cumulative exposure. We need to be sure that our employees are not being exposed to excessive risk.
2. The total records involved include only about 200 employees for a maximum time of employment of only about 16 years. It appears to be a reasonable sized effort to code this quantity of information now. Entry of future data annually would be quite simple.
3. We are faced with demands from EPA and other regulatory agencies for increasingly detailed exposure information. There is little doubt that such information will be required in the future. We are in the best position to interpret our data accurately. The alternative is likely to be the supplying of the "raw" data to NIOSH or EPA for their analysis.

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Mr. J. L. Myers

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February 19, 1980

The obvious question is how much time and effort would be required to write the programs and code the available information into the computer. I am pursuing this matter actively and hope to have definite information in the next several weeks.

H. B. Rhodes

Harrison B. Rhodes

/rmm
Attachments

A06992



INTERNAL CORRESPONDENCE

UNION CARBIDE CORPORATION

270 PARK AVENUE

To (Name) Mr. Kenneth Lentz
 Company Union Carbide Corporation
 Location Nuclear Division
 P. O. Box 613
 King City, California

Copy to Mr. C. E. Brown
 Mr. L. B. Emlet

Date September 27, 1963

Originating Dept.

Answering letter date

Subject

DISTRIBUTION

K. W. Lentz ☒J. A. Biddle ☒E. W. Haskins ☒L. F. Crow ☒G. C. Brice ☒D. S. Kamens ☒Foreman ☒File ☒

I am attaching two copies of Mr. McDaniel's report on the mine and plant operation during his visit September 10 through September 13. I think the report is self-explanatory, and we would concur with Mr. McDaniel's recommendations. I hope it will be possible to obtain equipment for the plant site for dust counts, etc., since it is very difficult to transport equipment every time a visit is made.

Mr. McDaniel reports that he did meet with the medical group in King City and was able to present to them some picture of what we are trying to do in industrial hygiene. I believe this was of educational value to the group.

Thank you very much for the courtesies shown Mr. McDaniel on his visit.

Very truly yours,

Medical Director

Thomas W. Nale, M.D.
 vm
 enclosures

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UCC 020738

Report of Investigation
Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

This was the first formal evaluation of the working environment for conditions that might be hazardous to health at the new plant and mine. It was concerned primarily with airborne dust.

Air samples were collected at both the mine and mill by a technique in which the dust was retained by impingement in liquid. Particle concentration was then determined by count using light-field microscopy and a magnification of 100 diameters. This is in accord with the standard procedures of the U. S. Public Health Service. Results are given in the accompanying table.

For safety, all particles were considered to be fibrous. While it is recognized that other materials may be present, studies of airborne material at Sterling Forrest by electron microscopy have shown that the fiber-bearing particles do not always have the familiar fiber shape, and positive distinction is possible only through elaborate and expensive techniques that are impractical for a dust control program. Further, in view of the very limited information available on the toxicity of short fiber asbestos, a conservative approach is indicated.

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Recommendations

Mine:

1. Require that caterpillar operators engaged in cleaning and scraping mine site wear respirators approved by the U. S. Bureau of Mines for toxic dusts. A relatively inexpensive respirator that resembles the non-approved mask now available, but which has been found adequate, is American Optical Co., Sure-Guard, No. R9100T.
2. The recommended maximum allowable dust concentration for long-term exposure at the mine is 5 million particles per cubic foot of air. Evaluate environment periodically to determine if exposures are controlled.

Mill:

1. The recommended maximum allowable dust concentration for mill work areas is 5 million particles (total) per cubic foot of air. Plan dust control to meet that limit.
2. Initiate a program for routine evaluation of dust concentrations at various operations at the mill site. The actual number of samples that must be collected for reliable evaluation and other details

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of the program will be defined as experience is gained in developing mill operations. For the early stages of operation, sampling should be conducted at monthly intervals until a good background of information is obtained and until experience shows that a longer interval is justified.

3. Obtain laboratory equipment necessary for routine dust evaluation. A list of equipment is shown below.
 - a.) Microscope. Bausch and Lomb model FBR-3(No. 31200423) with mechanical stage and Abbe condenser (N.A. 1.25) This is a monocular microscope that can be readily converted to a binocular type and is supplied with 10X, 43X, and 97X achromatic objectives, and 5X and 10X Huygenian eyepieces. Cost--approximately \$430. Source--laboratory supply house or directly from Bausch and Lomb.

A similar microscope of Japanese make that has been found acceptable at Grand Junction is obtainable from Unitron Instrument Co., 66 Needham Street, Newton Highlands 61, Massachusetts. The model number is MLU. It is equipped with essentially the same accessories as the B&L model (including

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10X, 40X, and 100X objectives, and 5X, 10X and 15X eyepieces). In addition, it has a built-in light. Cost--approximately \$270. I have asked that a catalog be sent to King City.

b.) Microscope Light (if B&L microscope is purchased).

B&L Optilume for monocular microscopes. Price--approximately \$8.50. Source--laboratory supply house.

c.) Whipple Micrometer Disc. For use in microscope eyepiece. Price--approximately \$7.50. Source--laboratory supply houses.

d.) 6 Sedgwick-Rafter (A.P.H.A.) Counting Cells.

Price--\$9.00 each. Source--Laboratory supply houses.

e.) Isopropyl alcohol as discussed during the visit.

4. Obtain air sampling equipment. Literature on available equipment will be forwarded as soon as received. Probable cost--\$250.

Detailed Findings

Mine

No mining was being performed during this visit but operations involved with the transportation of ore to the mill and general cleaning of the mine site were in progress.

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Dust counts were not found to be excessive except on the caterpillars dressing the mine site. Concentrations alongside the operators were about twice the recommended maximum of 5 million particles per cubic foot of air and indicated a need for improved protection of personnel. It was recommended that these people be supplied with respirators approved by the U. S. Bureau of Mines.

The amount of dust found in the open cab of a pick-up truck during travel from the mine site to the public road was higher than at some points at the mine but not to a significant degree. With further improvement to the road, concentrations in moving trucks should drop.

Mill

Only the front end of the process (ore treatment up to filtration) was operated during this visit. The remainder of the process will be investigated later in the year when the installation is completed.

Dust concentrations at various points of operation are shown in the table. None exceeded 5 million particles per cubic foot of air, but it was apparent that very careful control of the dry material was necessary to prevent a significant increase in airborne particles. Thus as production

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risers to mill capacity additional control measures may be indicated.

In view of the toxicity of asbestos and the low permissible air concentration, it was recommended that a program for routine periodic appraisal of the work environment be established, and that necessary equipment be obtained. While much of the program (sampling location, number of samples, and the number of investigations required per unit of time) cannot be defined until the mill is in normal operation, it was felt that initially plans should be made for monthly investigations. Information on sampling equipment needed for the program will be forwarded as soon as descriptive literature is received from the supplier.

The basic laboratory equipment for dust appraisal and its approximate cost is listed in the recommendations. The microscope selected need not be one of the makes listed but should have the same features and a complete line of available accessories. The question of imported or American-made is a matter for local decision which should consider in addition to cost the availability of parts and service. The other recommended laboratory supplies are more or less standard items in American dust control practice.

Paul W. McDaniel
Paul W. McDaniel
Industrial Hygiene Engineer

PWM/en

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Dust Concentrations
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<u>Sampling Location and Operation</u>	<u>Date</u>	<u>MPPCF</u> ⁽¹⁾	<u>Remarks</u>
<u>Mine Site</u>			
Alongside wobbler during loading trucks.	9/10/63	4.2 3.8 3.3 3.9	Variable wind direction and speed so that sampling location is upwind of dust part of time.
Riding caterpillars cleaning mine site.	9/10/63	9.6 10.9 11.3 11.8	Much large, non-respirable material noted.
Walking across ore pile	9/10/63	3.2 3.4	Light breeze (5 MPH) from west and south.
Riding pick-up with windows open on road from mine.	9/10/63	4.7 6.0	Deep dust on portions of road.
<u>Mill Site</u>			
Deck around Com-Bin feeder and screen 204	9/11/63	2.3 2.7	Wind from south (10-15 MPH). No ore moved from stockpile.
Same Location	9/11/63	3.1 3.7	Wind from north (10-15 MPH) and ore loaded on conveyor belt feeding Com-Bin feeder.
Walkways from screen 204 to shaking tables	9/11/63	1.7 1.9	
Deck around screen 204 and Com-Bin feeder	9/12/63	2.6 2.5	No ore moved from Stockpile. Very little wind.
Same Location	9/12/63	3.8 3.6	Ore loaded on conveyor belt feeding Com-Bin feeder.

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Mill Site (cont'd)

Walking over ore pile as pile was dressed by front loader	9/12/63	1.7	Not visibly dusty.
In front loader cab while dressing ore pile.	9/12/63	2.5	Not visibly dusty.

(1) MPPCF--Millions of particles per cubic foot of air.

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