

Monsanto

FROM
(NAME-LOCATION-PHONE) Terry L. Leet, Department of Medicine and Health Sciences, 314/694-8845

DATE : February 6, 1987

cc: H.F. Bonfili, MD - A3NB

SUBJECT : Indian Orchard Cohort Mortality Study

W.R. Gaffey - A3NK

J.L. Wolfsberger - A3NL

REFERENCE :

TO : S. Minshall - 1870

I was contacted this week by Gary Marsh's research assistant who informed me that they were analyzing the data from the Indian Orchard cohort mortality study and needed the department numbers that would designate those areas of the Indian Orchard plant that had the potential for exposure to specific chemicals, e.g. acrylonitrile, formaldehyde, styrene, and vinyl chloride. I had promised to provide Dr. Marsh with the information a few months ago, but forgot to follow-up by contacting you and asking for your assistance. The reason I need your help is that we need someone who is familiar (or knows someone who is familiar) with the history of the products that were manufactured at the Indian Orchard plant.

Last fall you were able to update the occupational exposure categories (OECs) that were needed for the cohort mortality study by adding the five-digit department numbers that had been used since the early 1970's to the three-digit department numbers that were used to create the OECs originally. This new request is somewhat similar to the one from last fall. We need the same type of information (department name, department number, and time frame) but for a specific chemical that may not be unique to one OEC.

I suggested in earlier correspondence that we consider acrylonitrile, formaldehyde, styrene, and vinyl chloride, since they have been debated in the medical literature as suspected human carcinogens and were used at the Indian Orchard plant. I may have been able to save you some work by compiling some information from earlier studies involving the Indian Orchard workforce that may be helpful in identifying the departments with formaldehyde and vinyl chloride exposures. A table listing the products associated with formaldehyde exposure was obtained from Dr. Marsh's PMR study of Indian Orchard employees exposed to formaldehyde, and I have added the department names and numbers as given to me by Dr. Marsh (Attachment 1). A second table contains information about departments with vinyl chloride exposure, which was compiled from my notes of the industry-wide vinyl chloride cohort mortality study that was updated a few years ago by Environmental Health Associates (Attachment 2). This table also contains the department numbers and the time frame when the departments were operating.

To complete this request, will you please review the department and time frame information for formaldehyde and vinyl chloride, and develop a similar scheme for acrylonitrile and styrene? If there are other chemicals that have

been used in the plant that you would like to include in the analysis, please provide the same information. However, I need this information by February 23, 1987, if at all possible.

Thanks for the helping hand and if I can offer any assistance please do not hesitate to call.

A handwritten signature in cursive script that reads "Terry L. Leet". The signature is written in dark ink and is positioned above the printed name.

Terry L. Leet

ATTACHMENT I

RSV0027052

Table 1

Areas of the Monsanto Company,
Indian Orchard Plant Associated with Formaldehyde Exposure

<u>Area</u>	<u>Dept No./</u>	<u>Time Frame</u>	<u>Materials Used</u>
I. Cast Phenolics	013, 014, 015	1938-1945	Formaldehyde, Phenol, Na. Solvents, Lactic Acid, Lead Molds Other
II. Resinox [®]			Formaldehyde, Phenol, Methanol Xylene, Hexamethylenetetramine Lump Resins (Formaldehyde), Accelerators, Dry Powders, Other
A. Resins	050	1939-Present	
B. Resins Compounding	052	1939-1958	
C. Molding Powder	053, 055 056, 057	1939-1956	
D. Other and Unspecified	058, 109 114, 149, 509	1939-Present	
III. Resimines [®]	068, 071, 072, 073, 074	1946-Present	Melamine, Butanol, Formaldehyde Urea, Resorcinol, Other
IV. Formalin Plant	054	1948-Present	Formaldehyde, Methanol, Silver Catalyst, Other
V. Service Dept.-Waste Disposal	173	1938-Present	Mixed

ATTACHMENT II

Area of the Monsanto Company
Indian Orchard Plant Associated with Vinyl Chloride Monomer Exposure

<u>Area</u>	<u>Dept No/Time Frame</u>
I. Vinyl Chloride Polymerization	
A. Opalon (Vinyl Chloride Polymerization)	080, 088 (1948-1972) 04020 (1972-1975)
B. Opalon (Polymerization/Co-Polymerization)	092 (1948-1975)
C. Opalon Paste Resins	084 (1948-1975)
II. Tank Farm	
	408-1 (1948-1972) 09060 (1972-1975)
III. Quality Control Laboratory - East	
	508-001 (1948-1972) 08010 (1972-1975)
IV. Polyvinyl Chloride Compounding **	
A. Opalon Blending	081 (1948-1972) 04010 (1972-1975)
B. Ultron Calendered Film	082, 085 (1948-1972) 040101 (1972-1975)
C. Opalon Compounds	083 (1972-1975) 04010 (1972-1975)
V. Ultron Color Laboratory **	
	174, 511 (1948-1972) 04010 (1972-1975)

*Watt Fleming***
Bill Blackas
John Sands
- Looking for Bib Gibb

These areas were thought to have had very little, if any, exposure to vinyl chloride monomer.

Dates compiled by: S. Marshall
Date: 3/5/87

Sources: "Sweet" Book. G. Lemos' office
Other employees
"Faith, Hope + \$5,000"

Monsanto

DEPARTMENT OF MEDICINE &
ENVIRONMENTAL HEALTH

Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63167
Phone: (314) 894-1000

August 15, 1983

Ms. Deborra Samuels
Environmental Health Associates, Inc.
2150 Shattuck Avenue, Suite 414
Berkeley, California 94704

Dear Deborra:

Enclosed are the worksheets for the 215 Monsanto employees who were in the original vinyl chloride cohort mortality study. We have verified the accuracy of the data listed on the worksheets, have made corrections when the data were in error, and have updated the worksheets with information through December 31, 1980. As instructed, we have written our entries in black ink.

Please note that we have separated the worksheets into three groups - active, inactive, and deceased as of December 31, 1980. Each group is sorted in numerical order by study ID. For the deceased employees, a copy of the death certificate is included if the employee died in Massachusetts, since their death certificates are considered public information. For two other employees, we are unable to provide you with a death certificate because we have signed a confidentiality agreement with the state in which they died. However, we have provided you with the death certificate number if it was listed on the certificate.

As you know from our earlier conversations, we were unable to find any documentation for the original study, either at Monsanto's Headquarters in St. Louis, Missouri or at the plant in Springfield, Massachusetts. However, the plant industrial hygienists have reconstructed the plant history for polyvinyl chloride (PVC) production. According to their notes, there were five buildings used for vinyl chloride polymerization and compounding between 1946-1947 and 1975. Four of the buildings (departments 080, 084, 088, and 092 before 1972 and department 04020 after 1972) were used for polymerization and the fifth building (departments 081, 082, 083, 085 before 1972 and 04010 after 1972) dealt with PVC compounding. A color laboratory (departments 174 and 511 before 1972 and 04010 after 1972) was used to develop color samples before the PVC was dyed on a larger scale. In the opinion of the industrial hygienists, there was very little, if any, exposure to vinyl chloride monomer in either the PVC compounding departments or the color laboratory, and employees who worked in these departments were not considered exposed for the purpose of this study. Since comparing the worksheets with the employment records from the plant, we have discovered that the PVC compounding departments and the color laboratory were not coded as exposed departments when the data were abstracted ten years ago. However, there may have been exposure to vinyl chloride monomer at the tank farm (department 408-1 before 1972 and

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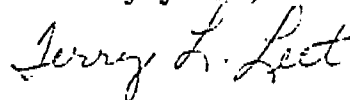
09060 after 1972) and in the quality control laboratory (department 508 before 1972 and 08010 after 1972), which was not considered when the study was originally designed. To distinguish between the vinyl chloride polymerization departments and the tank farm/quality control laboratory, we coded the corresponding exposure periods in two colors - black for vinyl chloride polymerization and red for the tank farm or quality control laboratory.

It appears that the only other information, regarding the selection of the cohort, was the list of jobs that you had in your file. The list titled "Jobs Involving Vinyl Chloride Monomer Exposure" may have been used to identify originally the employees at the Springfield plant who had been exposed to vinyl chloride monomer. All of the jobs were associated with vinyl chloride monomer exposure, but were not exclusively used as job codes for the vinyl chloride departments. Actually, some of the employees were considered exposed during a given time period because they had one of the jobs on the list although they were in a non-vinyl chloride department. For the purpose of this study, we considered the employee as unexposed during that specific time period. For eleven employees, there were no vinyl chloride departments listed in the employee's work history, which suggests the problem of misclassification. Of course, the key question is how many exposed employees were overlooked if the list of job codes were used as the only source of identifying vinyl chloride-exposed employees. Unfortunately, I cannot give you an estimate at this time, but may be able to provide you with more information at a later date when we receive our copy of the computerized work histories for the formaldehyde-exposed employees, which is being compiled by Westat, Inc.

Upon reviewing the worksheets, you will note that I only included the job codes and not the job titles. However, you can use the list of job codes in your files to determine the job titles. In a few cases, I included the job title, which is in parenthesis following the code.

Please do not hesitate to contact me if you need any additional information. I have enjoyed working with you on this project.

Sincerely yours,



Terry L. Leet
Epidemiologist

TLL:alw

enclosures

cc: W. R. Gaffey - G2WE
G. A. Lemos - 1870
J. L. Wolfsberger - G2WB
J. A. Yung - G2WE

<u>AREA</u>	<u>DEPT. NO.</u>	<u>TIME FRAME</u>	<u>MATERIALS</u>
Polymers 8 Bldg	098	1960-1977	AN, styrene, butadiene Copolymers & barrier resin
Distrex/SAN 816 Bldg	066	1955-1974	AN, Styrene
SAN ycleSafe) 12 Bldg	097	1974-1977	AN, Styrene
Suspension Polymer SAN - 92 Bldg)	?	1978-1980	AN, ?
Interim Production 0 Bldg (Krilium = Product)	?	1953-1962	AN, ?
Tank Farm	408	1955-Present	AN, Phenol, Pentane, etc
NIC Bldg	?	1978-1980	AN, Styrene, block butadiene Rubber
East Pilot Plant 68 Bldg.	760.58 OR 765.58	1950-Present	AN, Styrene, butadiene, MBR
West Pilot Plant 69 Bldg	760.58 OR 765.58		
East Control Lab	914.35	1972-1978	AN, Styrene, Butyraldehyde, etc.

Sources: "Smart" Book - G. Lemos office

- Former Employees
- Present Employees

Info compiled: 3-5-87
By S. Minshall

Dates may not be exact.

<u>Area</u>	<u>Dept. No.</u>	<u>Time Frame</u>	<u>Materials</u>
antafome	007	1958-1963	Styrene, Pentane
thalid Resin	013	1945 - ?	Styrene, Stabizinc 140, anhydrides, oil fatty acids.
ustrex 68 Bldg	060	1949-1975	Styrene
ustrex 3 Bldg	061	1949-1981	Polystyrene
ustrex - 9 Bldg	062	1958-1975	"
ustrex	063	1972- Present	"
"	064	? - 1963	"
"	065	1963- 1974	"
"	066	?	"
"	067	1949-1981	Pellet Extrusion
"	069	? - 1981	Polystyrene
"	070	1949-1981	Color Lab
SAN	097	1974-1977	Styrene, AN
interim Production	098	1961-1974	Styrene, Allyl Alcohol
-Polymers 8 Bldg	098	1961-1976	Styrene, AN, Butadiene Co-polymers, barrier resins.

Info compiled: 3/5/87
By: S. Minshall

Sources: "Smart" Book - G. Lemos' office
Current Employees