

ESIS, Inc.
a CIGNA company

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October 24, 1985

Mr. Terry Lohman, Plant Manager
J-M Manufacturing Company, Inc.
Highway 75 North
Denison, TX 75020

Re: ESIS Contract

Dear Mr. Lohman:

On September 16, 17, & 18, 1985, I made a visit to your plant to conduct an Environmental Health Survey. As a result of that visit, I am submitting the attached recommendations which should receive your immediate attention and consideration.

You will also find the results of the Environmental Health Report attached. These results are an indication of the environmental health conditions that existed on the days of my visit.

I wish to thank you and your staff for the cooperation that was extended during the course of this visit.

If you have any questions regarding this report and recommendations, please do not hesitate to call me at (713) 933-1826.

Sincerely,

Aileen Teng / pal

Aileen Teng, CIH
Sr. Environmental Health Specialist
CIGNA Loss Control Services, Inc.

AT/pal

cc: John T. Armstrong, J-M Manufacturing Co., Inc.
Dr. E. Edward Wang, Ph.D., J-M Manufacturing Co., Inc. ✓
Ms. Beth Ingleston, Alexander & Alexander of New York

NOV. 01 1985

D 002311

SC-JMM-3011

NAME: J-M Manufacturing Company	LOCATION: Denison, TX
EH 85-2 <u>The willow operator was exposed to asbestos levels in excess of the OSHA permissible exposure limit (See Table I). Exposure to asbestos can cause asbestosis, cancer of the lungs and digestive tract, and mesothelioma.</u> <u>The unusually high exposure level was attributed to improper work practices by an inexperienced worker. Due to the reduction of the workforce and change of work schedule, many workers were assigned to new job positions on September 16, 1985. It is recommended that employees be trained and informed on the appropriate work practices at the time of their initial assignment.</u> EH 85-3 <u>The noise exposure levels exceeded OSHA permissible exposure limits in most of the work areas. A comprehensive hearing conservation program has been instituted for all workers. To protect the worker's hearing, it is recommended that the hearing conservation program be continued.</u>	

D 002312

ENVIRONMENTAL HEALTH REPORT

PREPARED FOR:

J-M Manufacturing Company, Inc.
Denison, Texas

DATE OF SURVEY:

September 16, 17, & 18, 1985

CONDUCTED BY:

Aileen Teng, CIH
Sr. Environmental Health Specialist
CIGNA Loss Control Services, Inc.

D 002313

INTRODUCTION

On September 16, 17, & 18, 1985, an Environmental Health Survey was conducted at your plant in Denison, Texas, to evaluate employee exposures to noise, vinyl chloride monomer, respirable dust, total dust, asbestos and organic solvents. The survey was conducted at the request of J-M Manufacturing Company, Inc. as an ongoing monitoring program.

The standards, guidelines, results and discussion pertinent to this report follow.

STANDARDS AND GUIDELINES

The recommendations made in this report are based on current OSHA standards and/or accepted state-of-the-art industrial hygiene practices to give reasonable protection to the health and well-being of your employees.

The standards pertinent to this report are found in the Appendix section.

METHODS

Air Contaminants

Air sampling and analyses were conducted using the following.

Air Contaminant	Vacuum Source	Flow Rate Liters/Min	Collection Medium	Analytical Method
Asbestos	Gilian HFS-113UT Pumps, DuPont 2500 Sampling pumps	1.5	Open face AA filters	PCM * NIOSH P&CAM 239
Vinyl Chloride Monomer	Gilian HFS-113UT Pumps	0.05	2 CT** in series	NIOSH P&CAM 127 GC***
Respirable Dust	Gilian HFS-113UT Pumps	1.7	Pre-weighed PVC filters on mini-cyclones	NIOSH P&CAM 106
Total Dust	Gilian HFS-113UT Pumps	1.5	Pre-weighed PVC filters	Gravimetric
Tetrahydro-furan Ethyl Acetate Cyclohexanone	DuPont P-4000 Sampling Pumps	0.2	CT	NIOSH P&CAM 127 GC

- * PCM = Phase Contrast Microscopy
- ** CT = Activated Charcoal Tubes
- *** GC = Gas Chromatography

Unless otherwise stated, samples were taken in the workers' breathing zones to obtain samples indicative of actual employees exposure. Pumps were calibrated prior to and after the sampling period.

All analyses were conducted by Environmental Health Laboratory in Hartford, CT, which is accredited by the American Industrial Hygiene Association.

Noise

Sound level measurements were taken throughout the plant at the various operations in the hearing zones of the employees. General Radio Sound Level Meter, Type 1933 was used for the survey; this meter was acoustically calibrated with General Radio 1562 Sound Level Calibrator before and after use.

Quest Model M-7B and DuPont Mark I noise dosimeters were used to measure cumulative exposure to noise. The noise dosimeter measures and accumulates noise and produces a continuous reading of the allowable exposure to which the wearer has been subjected. The microphone of the dosimeter was clipped to the employee's shirt collar near the ear, thereby receiving and accumulating approximately the same dosage as the ear.

RESULTS

Asbestos

The results of asbestos sampling are presented in Table I. The concentrations are presented in number of fibers (longer than 5 microns) per cubic centimeter, by job description. Also included are sample time and sample volume.

Respirable Total Dust

The results of respirable free silica sampling are listed in Table II. The concentrations are presented in milligrams per cubic meter (mg/M^3), by job description and location, along with the applicable OSHA standard.

Vinyl Chloride

The results of vinyl chloride monomer sampling are presented in Table III. The concentrations are presented in milligrams per cubic meter (mg/M^3), by job description and location along with the applicable OSHA standard.

Organic Solvents

The results of organic solvents air sampling are listed in Table IV. The concentrations are presented in parts per million (ppm), by job description and location along with applicable OSHA standards.

When two or more hazardous substances are present, their combined effect, rather than that of either individually, should be given primary consideration.

The health effects must be considered additive unless there is evidence to the contrary; thus, exposures are added relative to their designated OSHA standards. When adding these exposures, a value "Em" (Equivalent Exposure for the mixture) is determined by the OSHA formula. Exposure is considered excessive when the value "Em" exceeds unity (1.00).

$$Em = \frac{TWA_1}{PEL_1} + \frac{TWA_2}{PEL_2} + \frac{TWA_3}{PEL_3} \dots + \frac{TWA_n}{PEL_n}$$

Where: TWA is the Time-Weighted Average concentration of a particular substance and PEL is the corresponding permissible limit for the substance.

Total Dust

The results of total dust sampling are presented in Table V. The concentration is reported in milligrams per cubic meter (mg/M³).

Noise

The results of noise level measurements and Time-Weighted Average (TWA) exposure are listed in Table V.

TABLE I

Account: J-M ManufacturingLocation: Denison, TXAIR SAMPLING DATA - ASBESTOS

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (fibers/cc)	Federal Standard(1) (fibers/cc)	TWA (2) (fibers/cc)	Sample Time (min)	Sample Vol. (liters)	Comments
13' Control Operator (D-2WE)	Johnny Moore	9/17/85	0.10	1.3	0.10	222	333	
13' Utility Operator (D-8WE)	Jimmy Lang	9/17/85	0.12	1.3	0.12	198	297	
13' Tender (D-1WE)	Ed Heironimus	9/18/85	0.18	1.3	0.18	257	385.5	
13' Head Curer (D-3WE)	Ray Terrell	9/17/85	0.15	1.3	0.15	263	394.5	
13' Curer (D-3WE)	Cecil Bell	9/17/85	0.071	1.3	0.071	213	319.5	
Willow Operator (D-7WE)	Johnny Crain	9/17/85	4.5	1.3	<u>4.5</u>	207	310.5	* <u>Exposure exceeded OSHA PEL.</u>

TABLE I

Account: J-M Manufacturing
Location: Denison, TX

AIR SAMPLING DATA - ASBESTOS

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (fibers/cc)	Federal Standard(1) (fibers/cc)	TWA (2) (fibers/cc)	Sample Time (min)	Sample Vol. (liters)	Comments
Machine Tender Operating Sal- vage Grinder (D-8WE)	Ed Heironimus	9/17/85	0.083	1.3	0.083	190	285	
In-Process Inspector (D-13S)	James Walsa	9/16/85	0.018	1.3	0.018	282	423	
Large Coupling Cut Off Op. (D-15F)	Bobby Brown	9/17/85	0.12	1.3	0.12	251	376.5	
Small Coupling Cut Off Op. (D-23F)	Thurman Stanley	9/16/85	0.14	1.3	0.14	276	414	
PVC Fitting Assembly-Mould- ing Swing Saw Op. (D-12F)	Jack Nelson	9/17/85	0.025	1.3	0.025	264	396	
MOA Operator (D-6F)	Arnold Gurman	9/16/85	0.27	1.3	0.27	322	483	

TABLE I

Account: J-M ManufacturingLocation: Denison, TXAIR SAMPLING DATA - ASBESTOS

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (fibers/cc)	Federal Standard(1) (fibers/cc)	TWA (2) (fibers/cc)	Sample Time (min)	Sample Vol. (liters)	Comments
UPL #2 Operator (D-4F)	Bill Roger	9/16/85	0.19	1.3	0.19	270	405	Processing 16" Class 150 pipes.
UPL #2 Inspector (D-11S)	Arthur Dawson	9/16/85	0.28	1.3	0.28	303	454.5	Processing 16" Class 150 pipes.
UPL #2 Hydrotester	D.F. Dill	9/16/85	0.17	1.3	0.17	285	427.5	Processing 16" Class 150 pipes.
UPL #2 Unit Loader (D-5F)	Goodin	9/16/85	0.027	1.3	0.027	285	427.5	Processing 16" Class 150 pipes.
UCL #1 Operator (D-16F)	James Melvin	9/17/85	0.13	1.3	0.13	248	372	Processing 16" Class 150 pipes.
Slash Saw Operator (D-1F)	Lynn Reynolds	9/17/85	0.34	1.3	0.34	240	360	

TABLE I

Account: J-M Manufacturing
 Location: Denison, TX

AIR SAMPLING DATA - ASBESTOS

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (fibers/cc)	Federal Standard(1) (fibers/cc)	TWA (2) (fibers/cc)	Sample Time (min)	Sample Vol. (liters)	Comments
Finishing Area Platform Driver (D-30F)	Jerry Bruce	9/16/85	0.051	1.3	0.051	228	342	
Coupling Testing Area Inspector	Linda Johnson	9/16/85	0.17	1.3	0.17	270	405	
Sweeper Operator (D-6S)	Thomas Bell	9/16/85	0.032	1.3	0.032	250	375	
Mechanic (D-26S)	George Kerley	9/17/85	0.055	2	0.055	239	358.5	
Electrician (D-15S)	Bill Williams	9/17/85	0.053	2	0.053	192	288	
Boring Mill Operator (D-17F)	Larry Henderson	9/16/85	0.11	1.3	0.11	282	423	
Band Saw Operator (D-21F)	Fred Kerley	9/17/85	0.11	1.3	0.11	164	246	

TABLE I

Account: J-M Manufacturing

Location: Denison, TX

AIR SAMPLING DATA - ASBESTOS

Job Description (J-M No.)	Employee Name	Date Sampled.	Air Conc. (fibers/cc)	Federal Standard(1) (fibers/cc)	TWA (2) (fibers/cc)	Sample Time (min)	Sample Vol. (liters)	Comments
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- (1) The OSHA 8-hour TWA permissible exposure limit (PEL) for asbestos is 2 fibers/cc.
The PEL for a 12-hour workday is calculated to be 1.3 fibers/cc (2 fibers/cc x 8/12 = 1.3 fibers/cc).
- (2) T.W.A. = The Time Weighted Average concentration for a normal 8 or 12 hour workday.
 This determination is based on the actual exposure time to the air contaminant.

TABLE II

Account: J-M ManufacturingLocation: Denison, TXAIR SAMPLING DATA - RESPIRABLE DUST

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (mg/M ³)	Federal Standard(1) (mg/M ³)	TWA (2) (mg/M ³)	Sample Time (min)	Sample Vol. (liters)	Comments
UPL #2 Operator	Bill Roger	9/17/85	0.028	3.3	0.028	210	357	Processing 16' Class 150 pipes.
UPL #2 Helper	Glen Weger	9/16/85	0.047	3.3	0.047	250	425	Processing 16' Class 150 pipes.
UPL #2 Inspector	Arthur Dawson	9/17/85	ND (3) <0.024	3.3	ND	242	411.4	Processing 16' Class 150 pipes.
UPL #2 Hydrotester	D.F. Dill	9/17/85	ND <0.024	3.3	ND	244	414.8	Processing 16' Class 150 pipes.
Boring Mill Operator	Larry Henderson	9/17/85	0.054	3.3	0.054	220	374	
MOA Operator	Arnold Gurman	9/18/85	ND <0.025	3.3	ND	232	394.4	
Small Coupling Cut Off Op.	Thurman Stanley	9/18/85	0.083	3.3	0.083	284	482.8	

TABLE II

Account: J-M Manufacturing
 Location: Denison, TX

AIR SAMPLING DATA - RESPIRABLE DUST

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (mg/M ³)	Federal Standard(1) (mg/M ³)	TWA (2) (mg/M ³)	Sample Time (min)	Sample Vol. (liters)	Comments
13' Head Curer	Ray Terrell	9/18/85	0.070	3.3	0.070	254	431.8	
13' Utility Operator	Jimmy Lang	9/17/85	ND <0.030	3.3	ND	198	336.6	
Large Coupling Cutt Off Op.	Bobby Brown	9/17/85	ND <0.024	3.3	ND	242	411.4	
Boiler, Ball Mill & Dryer Op. (D-55)	Herbert Aldredge	9/17/85	0.11	3.3	0.11	258	438.6	

(1) The OSHA 8-hour TWA PEL for respirable dust is 5 mg/M³. The PEL for a 12-hour workday is calculated to be 3.3 mg/M³ (5 mg/M³ x 8/12 = 3.3 mg/M³).

(2) T.W.A. = The Time Weighted Average concentration for a normal 12 hour workday. This determination is based on the actual exposure time to the air contaminant.

(3) ND = None Detected.

TABLE III

Account: J-M ManufacturingLocation: Denison, TXAIR SAMPLING DATA - VINYL CHLORIDE

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (ppm)	Federal Standard(1) (ppm)	TWA (2) (ppm)	Sample Time (min)	Sample Vol. (liters)	Comments
Extruder #1 Operator (V-21P)	Bruce Strandlien	9/16/85	ND (3) <0.10	0.7	ND	205	10.25	
Mixer Operator (V-1P)	Larry Jackson	9/17/85	ND <0.11	0.7	ND	182	9.1	
Extruder #5 Operator (V-20P)	Terry Askin	9/17/85	ND <0.081	0.7	ND	250	12.5	
Tool & Die during start-up of extruder #2 (V-3P)	Wayne Weger	9/18/85	ND <0.081	1	ND	250	12.5	

(1) The OSHA 8-hour TWA PEL for vinyl chloride is 1ppm. The PEL for a 12-hour workday is calculated to be 0.7 ppm ($1 \text{ ppm} \times 8/12 = 0.7 \text{ ppm}$).

(2) T.W.A. = The Time Weighted Average concentration for a normal 8-hour and 12-hour workday. This determination is based on the actual exposure time to the air contaminant.

(3) ND = None Detected.

TABLE IV

Account: J-M ManufacturingLocation: Denison, TXDate: 9/16,17,18/85AIR SAMPLING DATA - ORGANIC SOLVENTS

Job Description (J-M No.)	Employee Name	Air Contaminant	Air Conc. (ppm)	Federal Standard (ppm)	TWA (1) (ppm)	Sample Time (min)	Sample Vol. (liters)	Em
PVC Moulding & Assembly Operator	Lee Crain	Tetrahydro- furan	ND<0.049 0.16 0.42	200	0.22	63 90 95	12.6 18 19	0.06
		Ethyl Acetate	4.0 31 35	400	25	63 90 95	12.6 18 19	
		Cyclo- hexanone	0.10 0.047 0.033	50	0.06	63 90 95	12.6 18 19	

(1) T.W.A. - The Time Weighted Average concentration for a normal 8-hour workday. This determination is based on the actual exposure time to the air contaminant.

TABLE V

Account: J-M Manufacturing
 Location: Denison, TX

Date: 9/16,17,18/85

AIR SAMPLING DATA - TOTAL DUST

Job Description (J-M No.)	Employee Name	Date Sampled	Air Conc. (mg/M ³)	Federal Standard(1) (mg/M ³)	TWA (2) (mg/M ³)	Sample Time (min)	Sample Vol. (liters)	Comments
PVC Pipes Mixer Operator	Jack Richardson	9/18/85	2.2	10	2.2	253	379.5	

(1) The OSHA PEL for total dust is 15 mg/M³. The PEL for a 12-hour workday is calculated to be 10 mg/M³ (15 mg/M³ x 8/12 = 10 mg/M³).

(2) T.W.A. = The Time Weighted Average concentration for a normal 12 hour workday. This determination is based on the actual exposure time to the air contaminant.

TABLE VI

RESULTS OF NOISE MEASUREMENT

Account: J-M Manufacturing

Location: Denison, TX

Date: 9/16, 17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
TRANSITE DIVISION Willow Operator (N-7WE)	Johnny Grain	82-83	207 min.	20.46%	71.17%	<u>85</u>
13' Utility Operator	Jimmy Lang	-	180 min.	52.65%	210.60%	<u>92</u>
13' Control Op. (N-4WE)	Johnny Moore	86-91	222 min.	50.27%	163.04%	<u>91</u>
13' Head Curer	Ray Terrell	-	263 min.	46.37%	126.94%	<u>89</u>
13' Curer	Cecil Bill	84-90	213 min.	58.49%	197.71%	<u>92</u>
Machine Tender -Operating Sal- vage Grinder (N-8WE)	Ed Heironimus	-	190 min.	63.04%	238.89%	<u>93</u>
UPL #2 Unit Loader	Goodin	89-93	270 min.	68.30%	155.47%	<u>90</u>

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TABLE VI

RESULTS OF NOISE MEASUREMENTAccount: J-M ManufacturingLocation: Denison, TXDate: 9/16, 17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
UPL #2 Inspector	Arthur Dawson	90-98	281 min.	114.18%	292.56%	<u>95</u>
UPL #2 Operator (N-4F)	Bill Roger	91-107	289 min.	189.99%	473.33%	<u>98</u>
MOA Operator (N-6F)	Arnold Gurman	88-95	273 min.	106.47%	280.80%	<u>94</u>
PVC Moulding & Assembly Worker (N-17F)	Lee Crain	84-97	367 min.	128.24%	167.73%	<u>94</u>
In Process Inspector	James Welsa	88-93	295 min.	81.80%	199.65%	<u>92</u>
Coupling Testing Area Inspector	Linda Johnson	84-92	270 min.	64.29%	171.44%	<u>91</u>
Small Coupling Cut off Operator (N-14F)	Thurman Stanley	94-102 cutting 86-90 background	276 min.	89.5%	233.48%	<u>93</u>

TABLE VI

RESULTS OF NOISE MEASUREMENTAccount: J-M ManufacturingLocation: Denison, TXDate: 9/16, 17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
Large Coupling Cut off Operator (N-13F)	Bobby Brown	90-94 cutting 86-89 background	155 min.	48.11%	223.48%	<u>93</u>
Slash Saw Operator	Lynn Reynolds	100-104 Slash saw in operation 89-90 background	339 min.	107.50%	228.32%	<u>93</u>
Finishing Area Platform Driver (N-20F)	Jerry Bruce	-	190 min.	90.53%	343.06%	<u>96</u>
Finishing Area Mechanic	George Kerley	-	179 min.	29.30%	78.57%	<u>88</u>
Finishing Area Electrician	Bill Williams	-	192 min.	23.62%	59.05%	<u>86</u>
UCL #1 Operator (N-15F)	James Melvin	92-98 UCL#1 in operation 86-90 background	154 min.	46.27%	216.33%	<u>93</u>

TABLE VI

RESULTS OF NOISE MEASUREMENTAccount: J-M ManufacturingLocation: Denison, TXDate: 9/16, 17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
Boring Mill Operator (N-16F)	Larry Henderson	90-94 Boring mill in operation 86-91 background	220 min.	47.84%	156.57%	<u>90</u>
PVC Fitting Assembly mould- ing swing saw Operator (N-11F)	Jack Nelson	110-115 Swing saw in operation 88-90 background	222 min.	624.51%	1350.29%	<u>109</u>
Boiler, Ball Mill & Dryer Operator (N-5S)	Herbert Aldredge	-	256 min.	59.98%	168.69%	<u>91</u>
PVC DIVISION Extruder #1 Operator PVC Powder Hopper		87-90 90-92				

TABLE VI

RESULTS OF NOISE MEASUREMENT

Account: J-M Manufacturing
 Location: Denison, TX

Date: 9/16,17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
Extruder #3 (N-3P)	Paula Neely	88-90	240 min.	84.63%	253.89%	<u>94</u>
Extruder #5		88-90				
Extruder #6 Operator PVC Powder Hopper		87-89 92-94				
Extruder #7		85-87				
Extruder #8 & #9 Operator PVC Powder Hopper		85-89 89-90				
Extruder #11 Operator PVC Hopper		85-90 88-90				

TABLE VI
RESULTS OF NOISE MEASUREMENT

Account: J-M Manufacturing
Location: Denison, TX

Date: 9/16,17 & 18/85

Job Description (J-M No.)	Employee Name	SLM dBA(1)	Dosimeter Test Time (2)	Dosimeter Reading (3)	Full Shift Dose	Equivalent TWA dBA
Tool & Die	Wayne Weger	92-97	172 min.	62.01%	173.05%	<u>94</u>
Utility Op.	Steve Felder	-	413 min.	146.2%	254.88%	<u>97</u>
Mixer Operator (N-11M)	Larry Jackson		182 min.	54.17%	214.30%	<u>96</u>
Truck Driver	Jerry Turner		243 min.	96.83%	286.90%	<u>97</u>
MAINTENANCE DEPT. Mechanic	Steven Frank		200 min.	15.69%	37.66%	83
SHIPPING DEPT. Load Driver	John Lopez		228 min.	29.50%	62.11%	<u>87</u>

(1) SLM dBA: General Radio Sound Level Meter reading in dBA (using the "A" weighted scale, slow response).

(2) Test Time: Duration of dosimetry test in minutes.

(3) Dosimeter Reading: Noise dose as the percentage of the daily allowable dose.

DISCUSSION

The J-M Manufacturing Company, Denison plant, manufactures three different types of pipes: transite, PVC and permatran. The permatran plant was not in operation during the days of the survey. The transite plant is operated by one 3-day, 12-hour shift. The PVC plant operates around the clock.

Asbestos

As can be seen from the sample results presented in Table I, the willow operator was exposed to an asbestos level in excess of the OSHA permissible exposure limit. Exposure to asbestos can cause asbestosis, cancer of the lungs and digestive tract, and mesothelioma.

The management has already recognized the importance of controlling asbestos exposure. A comprehensive medical surveillance program and a respiratory protection program have been implemented. Local exhaust systems have been installed on all the machines. In the past, the willow operator's exposure levels were successfully controlled. The willow operator is required to wear a dust mask.

The management has attributed the unusually high exposure level detected during the survey to improper work practices by an inexperienced worker. Due to the reduction of the workforce and change of work schedule, many workers were assigned to new job positions on September 16, 1985. It is recommended that employees be trained and informed on the appropriate work practices at the time of their initial assignment.

It should be noted that OSHA issued a proposed standard for asbestos in April 1984 to lower the permissible exposure limit to either 0.2 fibers/cc or 0.5 fibers/cc.

Vinyl Chloride, Respirable Dust, Total Dust and Organic Solvents

As can be seen from the sample results presented in Tables II, III, IV, and V, the exposure levels to vinyl chloride, respirable dust, total dust and organic solvents were all within OSHA permissible exposure limits. OSHA permissible exposure limits are levels to which nearly all workers may be repeatedly exposed without adverse effects.

All the respirable dust samples listed on Table II had an insufficient dust deposit for a free silica analysis. Therefore, OSHA silica permissible exposure limit is not applicable in this case. Exposure limit for respirable total dust is used to evaluate the exposure levels.

Noise

The results of noise measurements (Table VI) indicate that noise levels exceeded the OSHA permissible exposure limit in many areas. A comprehensive hearing conservation program has been implemented by the management. To assure the protection for the worker's hearing, the hearing conservation program should be continued.

CONCLUSION

Implementation of the above mentioned recommendations should assist you in providing a more healthful working environment and reduce the potential for occupational disease.

D 002334

APPENDIX 1

STANDARDS AND GUIDELINES

A complete listing of the appropriate health standards can be found in the following Appendix. Included in this table are the following:

1. Occupational Safety and Health Standards, Subpart Z, CFR Title 29, Section 1910.1000. These standards represent the legal exposure limits as set by the Department of Labor.
2. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV's) refer to exposure limits as set by this organization. These limits, many of which were adopted by the Department of Labor, are the work of professional personnel in governmental agencies and educational institutions engaged in occupational safety and health programs. These TLV's should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations.
3. The National Institute of Occupational Safety and Health (NIOSH) has proposed changes in certain standards based on new evidence in regard to human health. These proposed limits are awaiting review, but should be kept in mind as applicable standards for the near future.

APPENDIX I

STANDARDS AND GUIDELINES FOR AIR CONTAMINANTS

SUBSTANCE	UNITS	Occupational Safety and Health Administration 29 CFR 1910.			American Conference of Governmental Industrial Hygienists (ACGIH)			National Institute for Occupational Safety and Health (NIOSH) Proposed	
		8-hr ¹	Ceiling ³	Peak ⁴	8-hr ¹	Stel ²	Ceiling ³	10-hr ¹	Ceiling ³
Asbestos	fibers/cc	2	10	-	2	-	-	0.1	0.5
Tetrahydrofuran	ppm	200	-	-	200	250	-	-	-
Ethyl Acetate	ppm	400	-	-	400	-	-	-	-
Cyclohexanone	ppm	50	-	-	25 skin	100	-	25	-
Vinyl Chloride	ppm	1	5	-	5	-	-	Minimum detectable level	1
Respirable Total Dust	mg/M ³	5	-	-	5	-	-	-	-

¹8-hr or 10-hr - The Time Weighted Average for an 8- or 10-hour work shift in a 40-hour workweek.

² Stel - ACGIH's standard maximum concentration to which workers can be exposed for a period up to 15 minutes. (Short Term Exposure Limit).

³ Ceiling (OSHA) - The concentration that should not be exceeded even instantaneously, except when the standard has a peak value (4).

⁴ Peak - Acceptable instantaneous peak exposure above ceiling concentration (4).

Skin Notation refers to the potential contribution to the overall exposure by the cutaneous route including mucous membranes and eye, either by airborne or by direct contact with the substance.