

INDUSTRIAL HYGIENE REPORT

TEXAS OPERATIONS

DOW CHEMICAL U.S.A.
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

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TITLE:

EVALUATION OF EMPLOYEE EXPOSURES TO ASBESTOS DURING REMOVAL OPERATIONS, UTILITIES
DISTRIBUTION A, TEXAS OPERATIONS, 1986

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PLAINTIFF'S EXHIBIT

DOW-779

SUMMARY

Employee exposures to asbestos were evaluated during the removal of asbestos insulation in the pipeway of the A-1600 block on August 7, 1986. All potential exposures were well within acceptable guidelines during the removal operation and ranged from 0.01 to 0.09 f/cc as an 8-hour time-weighted average.

The procedures outlined in the Texas operations Asbestos handbook were followed during the operation and all workers within the restricted area used approved respiratory protection and protective clothing.

ST0015170

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**EVALUATION OF EMPLOYEE EXPOSURE TO ASBESTOS
DURING REMOVAL OPERATIONS, UTILITIES DISTRIBUTION A**

INTRODUCTION

Employee exposures to asbestos were evaluated during the removal of asbestos insulation in the pipeway of the A-1600 block on August 7, 1986.

CONCLUSIONS

All potential exposures to asbestos were well within acceptable guidelines during the removal operation.

RECOMMENDATIONS

The individual monitoring results have been communicated to employees. The wet methods and procedures used during the job should be used whenever asbestos is removed to minimize potential employee exposures.

RESULTS AND DISCUSSION

The potential exposures to asbestos for the Coverers from the Insulation and Utilities A Departments ranged from 0.01 to 0.09 f/cc as an 8-hour time-weighted average. (See Table I.) At the time of the survey, the Industrial Hygiene Guide (IHG) for asbestos was 2 f/cc. The exposures were potential since all workers within the restricted area used single use dust respirators (3M 8710) or half-mask negative pressure respirators (Scott-a-Vista) and protective clothing during the removal operation. The procedures outlined in the Texas Operations Asbestos Handbook were followed during the operation.

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METHODOLOGY

Asbestos samples were collected using calibrated Gilian HFS 113A air sampling pumps. A known volume of air was pulled through 25 mm cellulose ester membrane filters, 0.8 micron pore size. Samples were collected at a flow rate of approximately 1 liter per minute. The samples were counted by McKee Environmental Health Services using phase contrast microscopy as outlined in NIOSH Method P&CAM 239.

EVALUATION CRITERIA

The evaluation of exposure levels was based on the following criterion:

	<u>Industrial Hygiene Guide</u>	<u>Source</u>
Asbestos	2 fibers/cc*	OSHA-PEL

*As of January 16, 1987, the OSHA PEL is 0.2 fibers/cc.

The OSHA Permissible Exposure Limit (PEL) is the time-weighted average concentration for a normal 8-hour workday, 40 hour work week, to which nearly all workers may be repeatedly exposed without adverse health effects.

TABLE I
ASBESTOS MONITORING RESULTS
UTILITIES DISTRIBUTION
A-1600

<u>Sample Number</u>	<u>Master Number</u>	<u>Job Classification</u>	<u>Date</u>	<u>Sample Time(Min)</u>	<u>8-hour TWA Concentration Fibers/cc</u>
1	141598	Coverer (Insulation Dept)	8-7-86	296	(0.09)
2	144498	Coverer (Utilities Dept)	8-7-86	172	(0.06)
3	141596	Coverer (Insulation Dept)	8-7-86	301	(0.01)
4	144357	Coverer (Insulation Dept)	8-7-86	293	(0.07)
Industrial Hygiene Guide					(2)
New Industrial Hygiene Guide (1-16-87)					(0.2)

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INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NO. A7-3010	PROCESS Utilities Dist A	BLDG. A702	DATE 8/7/86
MATERIAL asbestos	SAMPLING METHOD personal	TRAPPING MEDIUM 25mm filter	
TYPE OF PUMP S/N 12059	FLOW SET 1	FLOW RATE 1.03 l/min	FLOW FACTOR

REMARKS (VENTILATION, ETC.)

Removing asbestos in the A1600-Block

SAMPLE NO.	DESCRIPTION OF SAMPLES	TIME	CONC. ()
#1	<i>Plant A Insulation Dept</i> <i>George L. Carrasco, Coverer</i> <i>141548</i>		
	<i>downwind in LLG</i>		
	STOP <i>1</i>	<i>8:24</i>	
	START <i>1</i>	<i>10:28</i>	
		<i>296 min</i>	
	<i>Scott a Vista respirator</i>		
	<i>1.03 l/min x 296 min = 305 l</i>		

FILE NO. A7-3010	PROCESS Utilities Dist A	BLDG. A702	DATE 8/7/86
MATERIAL asbestos	SAMPLING METHOD personal	TRAPPING MEDIUM 25mm filter	
TYPE OF PUMP 12057	FLOW SET 2	FLOW RATE 1.94 l/min	FLOW FACTOR

REMARKS (VENTILATION, ETC.)

Pump stopped

SAMPLE NO.	DESCRIPTION OF SAMPLES	TIME	CONC. ()
#2	<i>Power Generation Mtr.</i> <i>John Boy, Coverer</i> <i>144478</i>		
	<i>downwind (removing asbestos from LLG)</i>		
	STOP <i>2</i>	<i>10:31</i>	
	START <i>2</i>		
		<i>172 min</i>	
	<i>Scott a Vista respirator</i>		
	<i>1.94 l/min x 172 min = 334 l</i>		

SIGNATURE

DATE

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INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NO. A7-3010	PROCESS Utilities Dist A	BLDG. A 702	DATE 8/7/86
MATERIAL asbestos	SAMPLING METHOD personal	TRAPPING MEDIUM 25mm flt	
TYPE OF PUMP S/N 12056	FLOW SET Rotameter @ 1	FLOW RATE 1.09 l/min	FLOW FACTOR

REMARKS (VENTILATION, ETC.)

Removal of asbestos in the A 1600 Block
5113

SAMPLE NO.	DESCRIPTION OF SAMPLES	TIME	CONC. ()
#4	(Plant A Insulation Dept) J. A. (Johnny) Dillard, Coverer 104357		
	Rotameter		
	STROKE COUNT		
	STOP 1	3:15	
	START 1	10:32	
	one top of piperack	293 min.	
	used hand saw		
	(wore 8710 respirator)		
	293 mins X 1.09 l/min = 319 l		

FILE NO. A7-3010	PROCESS Utilities Dist A	BLDG. A 702	DATE 8/7/86
MATERIAL asbestos	SAMPLING METHOD	TRAPPING MEDIUM 25mm flt	
TYPE OF PUMP S/N 8698	FLOW SET Rotameter 1.1	FLOW RATE 1.1 l/min	FLOW FACTOR

REMARKS (VENTILATION, ETC.)

SAMPLE NO.	DESCRIPTION OF SAMPLES	TIME	CONC. ()
#3	(Plant A Insulation Dept) J. A. Deyma, Coverer 104154		
	STROKE COUNT		
	STOP 1.1	3:30	
	START 1.1	10:30	
	on ground	30 min	
	(wore 8710 respirator)		
	301 mins X 1.1 l/min = 331 l		
#5	= Blank		

SIGNATURE **Anna D. Clark**

DATE **01-10-86**

ST0015174

$$C = \frac{(E)(A_c)}{V \cdot 10^3} = \frac{(\text{fibers/mm}^2)(385 \text{ mm}^2 \text{ for 25 mm filter})}{V(L) \times 10^3} \quad \text{A7-3010, D. Hick}$$

$A_c \text{ for 25 mm filter} = 385 \text{ mm}^2$

McKee Environmental
Health Services

August 18, 1986

LAB ANALYSIS REPORT

Client: Dow Chemical, USA
Address: Texas Operations
Freeport, Tx 77541
Attention: Mr. Benny Jenkins. (B101)
Analysis performed: NIOSH Method# 239
Fiber Counts

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Sample Identification	N.E.H.S. Sample No.	Sample Volume	Results fibers/mm ²	Concentration fibers/cc
A50-2899-1	86606		41.56	
2	7		80.60	
3	8		81.86	
4	9		61.71	
<i>Utilities Distribution</i> OCD-2960 3-1A	10		5.04	
3-2A	11		2.52	
A7-3010-1	12	305 l	118.4	0.15
2	13	374 l	134.8	0.16
3	14	374 l	13.85	0.02
4	15	319 l	88.16	0.11
5 Blank	16		5.04	
1-2998	17		5.04	
2- "	18		83.12	
3- "	19		123.43	
4- "	20		23.93	
5- "	21		100.8	
6- "	22		115.9	
7- "	23		25.19	
8- "	24		LT 1.26	
B-5213-1	25		391.4	
2	26		375.9	
3	27		LT 1.26	

LT = less than

Ronald L. McKee, C.I.H.

R. McKee

Pump Calibration
for asbestos monitoring
Milton Hi Flow Samplers
Model HFS 113A

A7-3010
S.D. Hicks
8/6/86

25 mm asbestos cassette in line
Before
S/N 8698 1.093 l/min Rotameter @ 1.1

After
1.118 l/min
1.116
1.112
1.122
1.117

Ave. 1.11 l/min
1.096
1.111
1.106
1.109

S/N 12059 1.042 l/min Rotameter @ 1.0

1.014
1.023
1.022
1.008
1.009

Ave. 1.03 l/min
1.044
1.044
1.041
1.037

S/N 12057 1.920
1.929
1.931

Rotameter @ 2

1.963
1.952
1.940
1.927
1.939

Ave. 1.94 l/min
1.932
1.942

S/N 12056 1.105
1.109
1.109

Rotameter @ 1

1.102
1.077
1.078
1.071
1.071

Ave. 1.09 l/min
1.105
1.105

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SECTION IV

SAFE WORK PROCEDURE

SUBJECT: REMOVAL OF FRAGILE ASBESTOS MATERIALS (INSULATION, ETC.)

Minimum Safety Equipment Requirements:

1. Hard hat must be worn.
2. ~~Full face respirator~~ *Full face respirator with high efficiency Particulate filters will be worn.*
3. ~~Approved dust respirator~~ *Full face respirator with high efficiency Particulate filters will be used.*
4. Disposable coveralls with hoods must be worn during removal and cleanup operations. Disposable coveralls will be disposed of daily by placing in properly sealed plastic bags and sent to the designated asbestos landfill. *Will use disposable coveralls with hoods and gloves. A decontamination unit will be there to dispose of the coveralls.*
5. Other boots are required and must be washed before leaving the isolated area.
6. A sufficient area must be taped off and signs placed to warn of asbestos removal work and possible presence of asbestos dust. Wind direction should be considered (see Appendix A). *Will be windy in order to barricade the street.*
7. ~~Asbestos removal permit~~ *Asbestos removal permit* (Form 13) must be filled out prior to the job and properly posted.
8. ~~Asbestos removal permit~~ *Asbestos removal permit* which is required by job location must be filled out.
9. ~~Asbestos removal permit~~ *We'll have two JLG lifts to do the job plus our safety belts.*

Special Precautions:

1. Comply with General Requirements and Precautions.
2. Use water to wet down the material before, during and after removal as necessary to prevent airborne emissions. Avoid high pressure blasting. Use a gentle spray/stream of water and avoid over wetting to the point that the material crumbles and turns to mush. An acceptable method is to use a 2 gallon hand sprayer. *Will be using the 2 gallon hand sprayer or have approved fan sprayer to wet the job.*
3. Material must not be dropped to the ground. Pre-job planning must include provisions for keeping deteriorated material in place after jacketing is removed. Tarping of scaffold landings, rubber bands, etc., should be considered. *Poly film plastic will be used to contain deteriorated material.*
4. Upon removal, provisions are needed so that the asbestos material can be placed directly into labeled polyethylene bags or containers approved by Environmental Operations. This will prevent the scattering of asbestos dust throughout the work area. Bags or containers must be lowered to the ground, not dropped. *As soon as the asbestos pipe cover is removed, it will be put in a polyethylene Asbestos bag.*
5. After material removal, a thorough inspection and cleanup must be made to remove all asbestos materials. Examples of areas to be cleaned are pipe/vessels, scaffold boards, piperacks, surrounding area at grade, etc. *We will clean the area of the pipe where the asbestos material was and seal the ends left exposed with CP-11 Mastic.*

MISSIONS SAFETY CHECK LIST

OF DESCRIPTION: White 2700 DATE 5-4-86
LOCATION Sand Lake Co 1800 Alt. Sta.

PRE-JOB REQUIREMENTS:

1. Environmental Services Contacted (ph. 1505)? Yes ☒ No ☐
Name: R. Snellgrove Date: 8-4-86
Dow Project Supervisor: Carol R. King
2. Safe Work Procedure Written? Yes ☒ No ☐ Date: 8-4-86
3. Project Review Held? Yes ☒ No ☐
Industrial Hygienist: Donna White Date: 8-4-86
Safety Director: Don Harshick Date: 8-4-86
Craftsmen: John J. & Sammy Dillard Date: 8-4-86
George Curales, Frank Sarna
- YES NO

Safe Work Procedure Approved:

Hygiene Monitoring Required:

Audit Required:

Auditor Assigned: W. H. Harkins APB Phone: 2025 2 —

JOB REQUIREMENTS:

1. Safe Work Procedure reviewed: ☒
2. Area taped off and signs up to warn others: ☒
3. Have all involved personnel been informed? ☒
4. Block personnel informed? ☒
5. Auditor notified: ☒
6. Water available to control dust: ☒
7. Has disposal of asbestos debris been arranged? ☒
8. Arrangements for clean-up made? ☒
9. Safety Equipment Required ☒
☒ Disposable Coveralls with Hood ☒ Side Shield Glasses
☒ Dust Respirator ☒ Rubber Boots
Other: See Safe Work Permit

NOTE: Work may commence when Safe Work Permit issued.

10. Final clean up complete (all traces of asbestos removed) Yes ☐ No ☐
 11. Job Complete: Dow Project Supervisor: _____ Date: _____
 12. Send completed Checklist to Industrial Hygiene Services - 8-101.

ST0015179

To Gerald Bowers / A702 date 9/8/86
Imaro Vera, A510

The results of monitoring of asbestos at the A1600 Block are attached.

The exposures were within accepted guidelines on the day monitoring was done.

We will monitor other jobs in the future. Be sure to let me know if you have a job that will last all day. We will try to get more monitoring data for a long job.

A 7-3010
S. S. Hicks

ST0015180

Asbestos Monitoring Results
Utilities Distribution
A1600

9/6/86

Sample Number	Master Number	Job Classification	Date	Sample Time (Min.)	Concentration* Fibers/cc
1	141598	Coverer (Insulation Dept)	8/7/86	296	0.15 (0.09)
2	144998	Coverer (Utilities Dist)	8/7/86	172	0.16 (0.06)
3	141596	Coverer (Insulation Dept)	8/7/86	301	0.02 (0.01)
4	144357	Coverer (Insulation Dept)	8/7/86	293	0.11 (0.07)

Industrial Hygiene Guide (2)

New Industrial Hygiene Guide (1/16/87) (0.2)

* Numbers in parenthesis is the 8-hr time-weighted average Concentration.