PLAINTIFF'S EXHIBIT

DOW-781

INDUSTRIAL HYGIENE REPORT
TEXAS OPERATIONS

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

FILE NUMBER:	A6-3311
DATE ISSUED:	May 17, 1988
PLANT CODE:	16100

TITLE:

EVALUATION OF CONTRACTOR WORK HABITS USING AREA MONITORING FOR ASBESTOS DURING A TRANSITE BOARD REMOVAL PROJECT AT TEXAS OPERATIONS-MAGNESIUM CASTING A, (A-629), ON MARCH 22 AND 30, 1988.

AUTHOR(S)
R. J. Reda Robert J. Reda

REVIEWER(S)
C. L. Sandlin C. L. Sandlin

SUMMARY

Asbestos area monitoring was performed during the removal of a transite board project at Magnesium Casting A, (A-629), on March 22 and 30, 1988. All area sample results were less than the acceptable exposure guidelines of 0.2 fibers/cc. Results of the eight samples taken ranged from <0.0002 to 0.12 fibers/cc with an average of 0.019 fibers/cc.

The procedures outlined in the Texas Operations Asbestos Handbook - February, 1987 were followed during this removal project by Win Way Contractors. The work area was cordoned off and all workers within the restricted area used approved respiratory protection and protective clothing. Disposal and clean-up operations followed the handbook guidelines.

ST0015193

D. E. Cragar, B-101
W. Demain, B-101
G. W. Engdahl, 1803, Midland
J. H. Hedrick, A-650
W. A. Johnson, A-650
*J. E. LeBeau, 1803, Midland
*L. W. Rampy, 1803, Midland
M. G. Swank, 1803, Midland

* Cover Sheet Only

RESTRICTED FOR USE WITHIN THE DOW CHEMICAL COMPANY ONLY

EVALUATION OF CONTRACTOR WORK HABITS USING AREA MONITORING FOR ASBESTOS DURING A TRANSITE BOARD REMOVAL PROJECT AT MAGNESIUM CASTING A, (A629), ON MARCH 22 AND 30, 1988

INTRODUCTION

On March 22 and 30, 1988, Win Way contractors removed transite board from Magnesium Casting A, (A-629), ceiling. Area monitoring was conducted to evaluate potential exposures to asbestos during this operation.

CONCLUSIONS

All area sample results were less than the acceptable exposure guidelines of 0.2 fibers/cc. Results of the eight samples taken ranged from <0.0002 to 0.12 fibers/cc with an average of 0.019 fibers/cc. Monitoring results have been communicated to Win Way Contractors for employee notification. See Table I for sampling results.

RESULTS AND DISCUSSION

Win Way contractors removed transite board from Magnesium Casting A ceiling, following procedures in the Texas Operations Asbestos Handbook - February 1987 Guidelines. The actual removal process lasted two days and occurred on March 22 and March 30, 1988.

Scaffolding and decking was erected to perform this removal project. A double layer of clear poly was laid out on the decking and attached to the scaffold's mid-rails. Prior to removal, each transite board was wetted with amended water. Once removed the transite was placed on a double layer of poly, wrapped and secured. The wrapped transite was lowered to the ground and placed in a dino box for disposal. The poly on the scaffolding was rolled up and properly disposed of with the work area being thoroughly cleaned.

Approved respirators and protective clothing was worn by all operators involved within this restricted area.

METHODOLOGY

Asbestos samples were collected using calibrated Gilian HFS 513 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 2 liters per minute. The samples were counted by McKee Environmental Health Services using NIOSH Analytical Method #7400.

ST0015194

EVALUATION CRITERIA

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

	OSHA PEL
Asbestos	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.

ST0015195

IHS FILE #A6-3311

TABLE I

ASBESTOS TRANSITE REMOVAL BY WIN WAY CONTRACTORS
MAGNESIUM CASTING A - BUILDING 629

Sample No.	Location	Date	Sample Time (min.)	Asbestos fibers/cc
A650 3-22-88 RJR 1	On top of conveyor #1 B	3-22-88	460 min.	0.0028
A650 3-22-88 RJR 2	#1 Bay Area on hand rail	3-22-88	457 min.	0.013
A650 3-22-88 RJR 3	On top of air conditioning unit by #2 conveyor	3-22-88	453 min.	0.004
A650 3-22-88 RJR 4	On top of column in the middle of #2 conveyor	3-22-88	462 min.	0.005
A650 3-30-88 RJR 1	10' west of pot #1	3-30-88	473 min.	0.0008
A650 3-30-88 RJR 2	On hand rail by #2 bay	3-30-88	470 min.	<0.0002*
A650 3-30-88 RFR 3	On hand rail between Furnace #2 and bay #2	3-30-88	470 min.	0.12
A650 3-30-88 RJR 4	On girder next #2 conveyor	3-30-88	470 min.	0.008

*< = less than/limit of detection

ST00155196

DOW CHEMICAL U.S.A.

TEXAS OPERATIONS
FREEPORT, TEXAS 77541

May 23, 1988

Mike Lowery
Win Way, Inc.
P. O. Drawer GG
Freeport, Texas 77541

FILE: IHS A6-3311

EVALUATION OF CONTRACTOR WORK HABITS USING AREA MONITORING FOR ASBESTOS DURING A TRANSITE BOARD REMOVAL PROJECT AT MAGNESIUM CASTING A ON MARCH 22 AND 30, 1988

Win Way contractor employees have been included in an Industrial Hygiene survey conducted by Dow Texas Operations Industrial Hygiene Department. The results of this survey as it pertains to your employees is attached. This removal project followed the Texas Operations Asbestos Handbook guideline procedures. It is your responsibility to inform your employees of the monitoring results of this survey.

Industrial Hygiene Services
Texas Operations

db

ST0015197

McKEE ENVIRONMENTAL HEALTH SERVICES
11114 Sugarpark • Houston, TX 77089 • (713) 481-3501

May 2, 1988

LAB ANALYSIS REPORT

ST0015198

Client: Dow Chemical, USA
Cheryl Sandlin (B101Y)
Freeport, Tx 77541

Test Performed: NIOSH Analytical Method #7400
Fiber Counts (asbestos)

Sample I.D.	M.E.H.S. Number	# of fields	# of fibers	fibers per mm^2
SIH #28	880248	20	143	910.8
32	9	20	127	808.9
34	50	47	100	271.0
A3601	1	100	9.5	12.10
2	2	100	5.5	7.01
3	3	100	10.	12.74
4	4	100	11.	14.01
6	5	100	2.5	3.18
7	6	100	4.5	5.73
8	7	100	1.	1.27
9	8	10	5.5	7.01
10	9	100	2.5	3.18
→ A650-1 (3/22)	880260	100	6.	7.64
2	1	100	25.	31.85
3	2	100	9.	11.46
4	3	100	10.	12.74
5	4	100	LT 0.5	LT 0.6
→ A650-1 (3/30)	5	100	2.	2.55
2	6	100	LT 0.5	LT 0.6
3	7	45	103.	291.6
4	8	100	17.	21.66
5	9	100	LT 0.5	LT 0.6

#350

INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NO.	PROCESS Asbestos/TRANSite Removal	BLDG. A629	DATE 3-30-8
MATERIAL Asbestos	SAMPLING METHOD 25mm filter	TRAPPING MEDIUM	
TYPE OF PUMP Gilian	FLOW SET	FLOW RATE	FLOW FACTOR

REMARKS (VENTILATION, ETC.) Asbestos handbook Texas Operations 2/87 - All Procedures in Removal Project were followed.

SAMPLE NO	SAMPLE DESCRIPTION		STROKE COUNT	TIME	TOTAL TIME (MIN.)	
A650 3-30-88 RTR1	PUMP S/N 1259C FLOW FACTOR: Location - by #1 Pot Approximately 10' AWAY See Attached MAP. Calibration before 2.013 LPM after 1.973 LPM Avg 1.993 LPM (blank Subtracted)	START		7:42 AM	473 min.	(1.95)(385) / 943000 = 0.0008 f.b.e./m.
		STOP		3:35 PM		
		TOTAL LITERS AIR: 943 l				
A650 3-30-88 RTR2	PUMP S/N 2100 FLOW FACTOR: Location - ON RAIL by #2 BAY See Attached MAP. Calibration before 2.038 LPM after 1.961 LPM Avg 1.999 LPM (blank Subtracted before <)	START		8 AM	470 min	(<.6)(385) / 940000 = < 0.0002 fibers/ml
		STOP		3:50 PM		
		TOTAL LITERS AIR: 940 l				
A650 3-30-88 RTR3	PUMP S/N 1256C FLOW FACTOR: ON RAIL between furnace #2 and bay #2 See Attached MAP. Calibration before 1.970 LPM after 1.945 LPM Avg 1.958 LPM (blank Subtracted)	START		7:55 AM	470 min.	(291)(385) / 920000 = 0.12 fibers/ml
		STOP		3:45 PM		
		TOTAL LITERS AIR: 730 l				

SIGNATURE: R. Reed DATE: 4-5-88

ST0015199

INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NO.	PROCESS Asbestos / Transite Removal	BLDG A629	DATE 3-30-88
MATERIAL Asbestos	SAMPLING METHOD 25mm filter	TRAPPING MEDIUM	
TYPE OF PUMP G.I.A.N	FLOW SET	FLOW RATE	FLOW FACTOR

REMARKS (VENTILATION, ETC.) Asbestos handbook Texas Operations 2/88
All Procedures on Removal Project well followed.

SAMPLE NO	SAMPLE DESCRIPTION		STROKE COUNT	TIME	TOTAL TIME (MIN.)
A 650	PUMP S/N 2097C FLOW FACTOR:	START		7 50 AM	470 min
	ON Girder Next to #2 Conveyor	STOP		3 40 PM	
3-30-88	See Attached Map	TOTAL LITERS AIR: 9728 l			
RJR4	calibration before 2.089 lpm after 2.046 lpm Avg. 2.068 lpm	(21.06) x (385) / 972000 = 0.008 Fibers/ml (blank Subtracted)			
A 650	PUMP S/N FLOW FACTOR:	START			
3-30-88		STOP			
RJR5		TOTAL LITERS AIR:			
(blank)					
	PUMP S/N FLOW FACTOR:	START			
		STOP			
		TOTAL LITERS AIR:			

ST0015200

SIGNATURE: DATE:

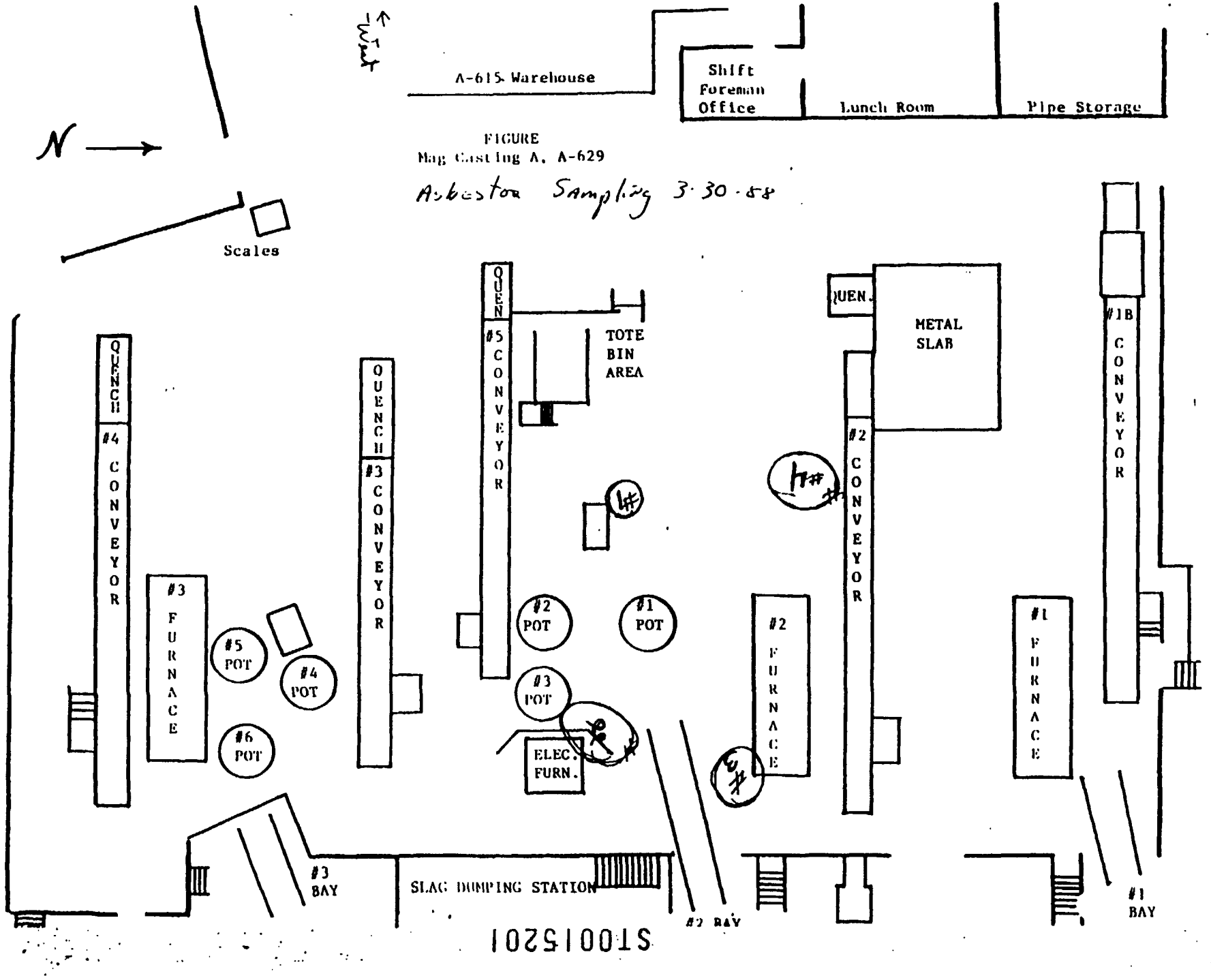


FIGURE
Mag Casting A, A-629

Asbestos Sampling 3-30-88

ST0015201

DOW CHEMICAL U.S.A.
TEXAS OPERATIONS

Reorder Per Pad - Dow Code 07-02515-0C

JOB NO
CHARGE NO
AUTH NO
FILE NO
SUBJECT Transite Removal Project
BY
DATE
A629 3/30/88
Mag Conf A
SHEET OF
CHECKED BY

Calibrate Calibrate Model PWD 800268
Gilian Corp. SN, 9355

3/30/80 Pre 1259C

FLOW	AVERAGE	# SAMPLES
2003	2003	01
2013	2008	02
2012	2009	03
2008	2009	04
2020	2011	05
2018	2012	06
2016	2013	07

3/30/80 Pre 2100

FLOW	AVERAGE	# SAMPLES
2045	2045	01
2044	2045	02
2052	2047	03
1962	2026	04
2059	2032	05
2052	2036	06
2051	2038	07

Pre 3/30/80 2097C

FLOW	AVERAGE	# SAMPLES
[illegible]	[illegible]	01
[illegible]	[illegible]	02
[illegible]	[illegible]	03
2068	2068	04
2067	2068	05

3/30/88 1256C Pre

[illegible]	[illegible]	01
1967	1968	02
[illegible]	[illegible]	03
[illegible]	[illegible]	04
[illegible]	[illegible]	05
[illegible]	[illegible]	06

α 3/31/0

-172.7	000.0	00
1959	1959	01
1964	1962	02
1964	1962	03
1964	1963	04
1962	1963	05
1962	1963	06
1958	1962	[illegible]
[illegible]	1C	

ES 1259C

1972	1972	01
1974	1973	02
1981	1976	03
1981	1977	04
1977	1977	05
1976	1977	06
1953	1975	07

Post 3/31/88

FLOW	AVERAGE	# SAMPLES
2043	2043	01
2043	2043	02
2044	2043	03
2048	2045	05
2047	2046	07

2097C Post 3/31/88

[illegible]	[illegible]	01
1947	1945	02
[illegible]	1946	03
1946	1946	04
[illegible]	[illegible]	05

Post 3/31/88 1256C

ST00015202

INDUSTRIAL HYGIENE SAMPLE RECORD

FILE NO.	PROCESS Asbestos/TRANSite Removal	BLDG. A629	DATE 3-23-8
MATERIAL Asbestos	SAMPLING METHOD 25 mm filter	TRAPPING MEDIUM	
TYPE OF PUMP Gilian	FLOW SET	FLOW RATE	FLOW FACTOR

REMARKS (VENTILATION, ETC.) Asbestos HANDbook Texas Operations 2/87
All Procedures in Removal Project WERE followed.

SAMPLE NO	SAMPLE DESCRIPTION		STROKE COUNT	TIME	TOTAL TIME (MIN.)
A650-3228 8-RJR1	PUMP S/N 1259C FLOW FACTOR: location - ON top of #1B conveyor - See Attached MAP.	START		8:00 AM	460 min.
		STOP		3:40 PM	
		TOTAL LITERS AIR: 953 l			
	Calibration before 2.069 LPM After 2.077 LPM Avg. 2.073 LPM	(7.04) (385) / 753000 = 0.0028 fibs/ml (blank Subtracted)			
A650-3228 8-RJR2	PUMP S/N 12056 FLOW FACTOR: location - #1 BAY Area See Attached MAP.	START		8:03 AM	457 min.
		STOP		3:40 PM	
		TOTAL LITERS AIR: 912 l			
	Calibration before 2.009 LPM After 1.982 LPM AVG. 1.995 LPM	(31.25) (385) / 912000 = 0.013 fibers/ml (blank Subtracted)			
A650-3228 8-RJR3	PUMP S/N 12057 FLOW FACTOR: location - ON top of Air Conditioning unit See Attached MAP.	START		8:05 AM	453 min.
		STOP		3:42 PM	
		TOTAL LITERS AIR: 944 l			
	Calibration before 2.070 LPM after 2.098 LPM Avg 2.084 LPM	(110.86) (385) / 944000 = 0.004 fibers/ml			

ST0015203

SIGNATURE: R.L. Reed DATE: 3-29-88

INDUSTRIAL HYGIENE SAMPLE RECORD

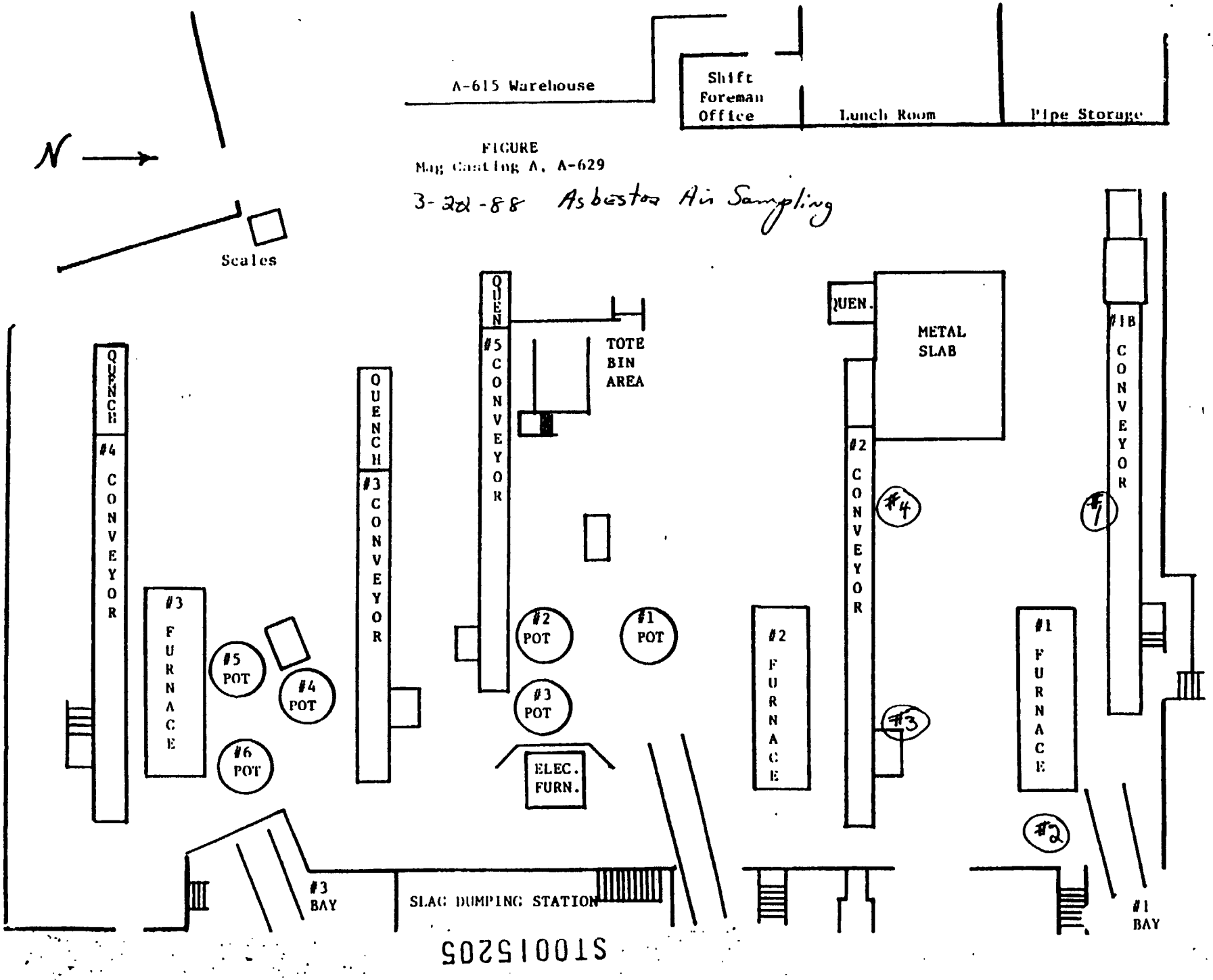
FILE NO.	PROCESS Asbestos Transite Removal	BLDG. A629	DATE 3-23-8
MATERIAL Asbestos	SAMPLING METHOD 25 mm filter	TRAPPING MEDIUM	
TYPE OF PUMP Gilian	FLOW SET 2.0 LPM	FLOW RATE 2.0 LPM	FLOW FACTOR

REMARKS (VENTILATION, ETC.) Asbestos Handbook - Texas Operations 2/87
All Procedures in Removal Project were followed.

SAMPLE NO	SAMPLE DESCRIPTION		STROKE COUNT	TIME	TOTAL TIME (MIN.)
A650-3-22-88 RJR 4	PUMP S/N 2100	START		7:59 AM	462 min.
	FLOW FACTOR:				
	location - on top of column by the middle of conveyor #2	STOP		3:41 PM	
	See Attached Map.	TOTAL LITERS AIR: 923 l			
	Calibration before 2.057 LPM	$\frac{(12.14)(385)}{943000} = 0.005$ fibers/ml			
	after 2.026 LPM				
	Avg. 2.042 LPM				
A650 3-22-88 RJR 5 (blank)	PUMP S/N	START			
	FLOW FACTOR:				
		STOP			
		TOTAL LITERS AIR:			
	(Subtracted)				
	PUMP S/N	START			
	FLOW FACTOR:				
		STOP			
		TOTAL LITERS AIR:			

ST0015204

SIGNATURE: R. J. Reda DATE: 3-29-88


A-615 Warehouse
Shift Foreman Office
Lunch Room
Pipe Storage
N
Scales
FIGURE
Mag Casting A, A-629
3-22-88 Asbestos Air Sampling
QUENCH #4 CONVEYOR
#3 FURNACE
#5 POT
#4 POT
#6 POT
QUENCH #3 CONVEYOR
QUEN #5 CONVEYOR
TOTE BIN AREA
#2 POT
#1 POT
#3 POT
ELEC. FURN.
#3 BAY
SLAG DUMPING STATION
QUEN.
METAL SLAB
#2 CONVEYOR
#4
#3
#2 FURNACE
#1B CONVEYOR
#1
#1 FURNACE
#2
#1 BAY
S10015205

DOW CHEMICAL U.S.A.
TEXAS OPERATIONS

Reorder Per Pad - Dow Code 07-02515-0

DOW

JOB NO MAG. CAST. A Plant
CHARGE NO Asbestos - Transite Removal Survey.
SUBJECT ON 3/23/88

AUTH NO
FILE NO

ST0015206

Pre Calibration

pre-cal 3/22/88

FLOW	AVERAGE	# SAMPLES
08	2008	01
92	2000	02
09	2003	03
84	2023	04
10	2021	05
08	2019	06
12	2018	07
44	2008	08
10	2009	09

12056 SN Gilian Pump

FLOW	AVERAGE	# SAMPLES

pre-cal 12057 3/22/88 Gilian Pump

FLOW	AVERAGE	# SAMPLES
063	2063	01
2086	2075	02
2067	2072	03
2113	2082	04
2050	2075	05
2055	2074	06
2060	2072	07
2060	2071	08
2065	2070	09

FLOW	AVERAGE	# SAMPLES
[illegible]	[illegible]	01
[illegible]	[illegible]	02
[illegible]	[illegible]	03
[illegible]	[illegible]	04
2062	2055	05
2062	2056	06
2053	2055	07
[illegible]	2056	08
63	2057	09

#2100 3/22/88 pre-cal Gilian Pump

FLOW	AVERAGE	# SAMPLES
086	2086	01
[illegible]	2090	02
[illegible]	2061	03
[illegible]	2051	04
[illegible]	[illegible]	05
[illegible]	[illegible]	04
[illegible]	2059	05
[illegible]	[illegible]	06
[illegible]	[illegible]	07
[illegible]	[illegible]	08
[illegible]	[illegible]	07
[illegible]	[illegible]	08

#1259C 3/22/88 pre-cal Gilian Pump

after/Post Calibr. 3/24/88

FLOW	AVERAGE	# SAMPLES
1976	1976	01
1982	1979	02
1983		03
1973	1981	04
1979	1980	05
1976	1980	06
1976	1979	07
1979	[illegible]	08
-1979	[illegible]	07
1983	[illegible]	08
1997	1981	09
1986	1982	10

12056 Gilian Pump

FLOW	AVERAGE	# SAMPLES

FLOW	AVERAGE	# SAMPLES
2030	2030	01
2034	2032	02
2024	2029	03
2041	2032	04
327.2	1691	05
-327.2	2032	04
1959	2018	05
2049	2027	06
2048	2028	07

2100 Gilian Pump

FLOW	AVERAGE	# SAMPLES
2101	2101	01
2097	2099	02
2098	2099	03
2095	2098	04
2100	2098	05
2101	2099	06
2093	2098	07

12057 Gilian Pump

FLOW	AVERAGE	# SAMPLES
[illegible]	1247	02
[illegible]	2070	01

FLOW	AVERAGE	# SAMPLES
63	2063	01
80	2072	02
74	2072	03
[illegible]	2073	04
[illegible]	2074	05
[illegible]	2074	06
[illegible]	2074	07

Gilian Pump 1259C

Model PNP 800268 SN/935S

Gilibrator Calibrator Gilian Corp.

SECTION XII

ASBESTOS ABATEMENT
AUDIT CHECKLIST

Job Description TRANSSite Removal from Ceiling Date: 3-30-88

Location: A629 Removal by: Win Way - Contractors
Company Name

1. Regulated Area Established and Signs Posted: YES ✓ NO ___
   Polyethylene or other coverings over floor & objects: YES ✓ NO ___

2. Decontamination Area Established: YES ✓ NO ___
   Contiguous ___ Remote: ___ Location: yes

   Entry to work area only through decontamination area cordon off area is also decontamination area YES ___ NO ✓

3. Negative Pressure Enclosure Established: YES ___ NO ✓
   - Floor Covered YES ___ NO ___
   - Walls Covered YES ___ NO ___
   - Area Ventilation OFF YES ___ NO ___
   - All Edges Sealed YES ___ NO ___
   - Penetrations Around Pipes and Conduit Sealed YES ___ NO ___
   - Entry Curtains YES ___ NO ___
   - Negative Pressure Achieved (-0.02" water) YES ___ NO ___

4. Protective Equipment:
   - Disposable Coveralls with Hood and Boots YES ✓ NO ___
   - Coveralls Unzipped, Torn, or Cut YES ___ NO ✓
   - Coveralls Used One Time YES ✓ NO ___
   - Approved Respirator 1/2 face piece Respirator was worn. YES [redacted] NO ___
     - Type Used [redacted]
     - Clean Shaven YES ✓ NO ___
     - Straps Under Hood YES ✓ NO ___
   - Safety Equipment Required by Location:
     - Hard Hat YES ✓ NO ___
     - Safety Glasses YES ✓ NO ___
     - Goggles YES ✓ NO ___

Scaffolding floor was lined with plastic to keep falling pieces at a controllable situation. (See procedure attached)

ST0015207

SECTION XII

ASBESTOS ABATEMENT
AUDIT CHECKLIST

5. Work Practices:

Material Worked Wet	YES ✓	NO
Material Kept Wet Until Bagged & Sealed	YES ✓	NO
Material Too Wet, Mushy	YES	NO ✓
Insulation Broken Intentionally	YES	NO ✓
Material Dropped to Ground	YES	NO ✓
Removed Material Promptly Bagged	YES ✓	NO
Bags Torn or Left Open	YES	NO ✓
Visible Emissions	YES	NO ✓
HEPA Filtered Vacuum Used N/A	YES	NO
Smoking, Eating, Drinking, Chewing, Cosmetics	YES	NO ✓
Continuous Job — Personnel Decontaminated Each Departure N/A	YES	NO
Shower Used by All Personnel N/A	YES	NO
Exposed Asbestos at Terminations Sealed with Encapsulant N/A	YES	NO
Work Area Cleaned After Completion wet methods	YES ✓	NO

6. Personnel Monitoring NO

Initial Monitoring ✓ Contractor ✓ Dow ✓	YES ✓	NO
Daily Monitoring area Monitoring	YES ✓	NO
Area Monitoring	YES ✓	NO

COMMENTS: Transite Removal was completed following ~~with~~ the approved procedure for that particular operation. See attached form.

SIGNATURE: [signature]
Industrial Hygienist/Safety Director

cc: Project Supervisor
Area Owner
Safety Director
Industrial Hygienist
Manager, Industrial Hygiene Services

1/25/87
db

ST0015208

Mg Cast A

2/8/88

PROCEDURE FOR THE REMOVAL OF TRANSITE FROM

CEILING OF A-629

1. All rules and regulations as per the TEXAS OPERATIONS ASBESTOS HANDBO shall apply where relevant.

2. This will be a large scale, long duration job with the exception of a negative air enclosure.

3. The entire area shall be worked in sections. (ex: 1/4 at a time, etc.

4. Scaffolding shall be erected in such a fashion as to solidly deck the area to be stripped.

5. Clear poly (doubled layered) shall be laid out on the decking and attached to the scaffold's mid-rails.

6. Prior to removal, each transite sheet shall be wetted with amended water.

7. The transite shall then be removed from the ceiling using a pry bar. (Care should be taken to avoid breaking any transite material.)

8. Removed transite shall be placed on a double layer of poly which is large enough to be wrapped around several stacked sheets of transite and secured.

9. The wrapped transite shall be lowered to the ground by a rope and placed in a dino box for disposal.

10 At the end of the day the wok area shall be thoroughly cleaned. The poly on the scaffold shall be rolled up and properly disposed of.

ST001-5209