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DOW-1226

INDUSTRIAL HYGIENE REPORT

BIANNUAL ASBESTOS IN AIR SURVEY
CHLOR-ALKALI II
LOUISIANA DIVISION

CRI NO.

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SUMMARY

The biannual asbestos in air survey for Chlor-Alkali II was recently completed. The operators pulping cells and the temporary asbestos storage area were monitored.

These two areas should have the highest potential asbestos exposures. The asbestos levels ranged from a high of 0.07 fibers/cc while an operator was pulping cells (3-hour sampling time) to a low of 0.01 fibers/cc for two 6-1/2-hour stationary samples and one 2-hour pulping sample.

The results are well below the present standard of 2 fibers/cc as well as the stricter proposed standard of 0.1 fibers/cc greater than 5 microns in length.

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INTRODUCTION

The biannual asbestos in air survey was recently conducted in the Chlor-Alkali II Plant. The survey is performed twice annually to guard against workers' overexposure to asbestos fibers in air and to meet the requirements of the federal Occupational Safety and Health Act. The two areas monitored were the cell operators, who pulp cells with asbestos, and the temporary asbestos storage area. These two areas are considered the potential areas for an exposure.

The cell operators were monitored only for the period of time that they were pulping cells which resulted in peak exposure conditions. The asbestos storage area samples, however, were obtained over a 5-1/2 to 6-1/2 hour time period resulting in time weighted average samples.

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EXPERIMENTAL

Sampling Method

Personnel samples were collected from the operators breathing zone with a 37 mm diameter 0.8 micron pore size millipore filter mounted on an open face filter holder and attached to the operators lapel. These cassettes were connected to monitoring pumps calibrated with a soap bubble meter to operate at a range of 1.7 to 2.0 liters per minute.

Area samples were collected utilizing the same equipment and method as the personnel samples. Sampling pumps were located approximately ten feet downwind from the asbestos storage area and approximately three feet above the ground.

Analytical

After obtaining the sample on the millipore filter, a four square grid section is cut from the exposed filter and placed atop a drop of clear mounting solution. The sample is centered on a microscope slide, covered with a cover slip, and allowed approximately fifteen minutes to clear up before the fiber counting may begin. (The mounting solution is prepared by placing 3 ml each of diethyl oxalate and dimethyl phthalate in a container with 0.6 g of ground up plain white millipore filter paper which dissolves into a clear solution in approximately three days.)

The samples are magnified 500 times with the Reichert Zetopan optical microscope and Nomarski Interference Contrast is used. All fibers over 5 microns in length with a 3 to 1 length to width ratio are counted as fibers (only one of the four squares is selected to count).

After the square grid is selected to be counted, twelve passes are required with the microscope to cover the entire square. All fibers greater than 5 microns in length are counted. To obtain the fibers/cc concentration (greater than 5 microns in length) the following calculation is used.

$$\text{Fibers/cc} = \frac{\text{fiber count } (> 5 \text{ microns in length}) \times \text{sizing factor (92) for filter}}{\text{cc of air}}$$

(sampling time in minutes x flow rate of pump)

DISCUSSION

The cell area monitored consists of eight series of M-82 diaphragm cells set in two rows of four with each series measuring approximately one hundred and twenty feet in length. The cells are located in an open area with no roof or walls.

The asbestos mixing box for pulping cells is located within ten feet of the center of the cell area. The asbestos is stored in sacks and stacked on pallets ten feet west of the mixing box between two series of cells and completely covered with VisQueen.

The asbestos required to pulp the leaking cells is stored in fifty and one-hundred-pound plastic sacks depending upon which type asbestos is being used.

After the asbestos is emptied from the plastic sacks into the mix box, the empty sacks are placed in an impermeable plastic liner inside a large plastic garbage can. When full, the plastic liner is sealed, removed and carried to the division's designated landfill area and buried.

Plant supervision enforces the pulping procedure as set forth in Attachment 1.

The temporary asbestos storage area does present a housekeeping problem and small pieces of asbestos which are difficult to control can be seen on the concrete slab at times. This hazard can be controlled and will be eliminated when the asbestos slurry trailer, presently under construction, is completed. This trailer will transport asbestos in a wet slurry from the New Cell Service facility to the Chlor-Alkali Plant where the slurry will be pumped through a closed system to the cells that require pulping. This project will eliminate handling any dry asbestos in the plant and greatly reduce the potential asbestos exposure. (A complete description and discussion of the pulping operation is attached and can also be found in Data Book Number 1677, pages 7 and 8.)

RESULTS

The sampling data results were all well below the present TLV of 2 fibers/cc. The results were also below the much stricter proposed TLV of 0.1 fibers/cc.

The samples obtained while the operators were pulping cells ranged from a high of 0.07 fibers/cc to a low of 0.01 fibers/cc greater than 5 microns in length. The average was 0.03 fibers/cc. (See Attachment 2.)

The stationary samples obtained downwind from the temporary asbestos storage area ranged from a high of 0.05 fibers to a low of 0.01 fibers/cc with an average of 0.02 fibers/cc. (See Attachment 2.)

CONCLUSIONS

The monitoring results continue to be satisfactory. However, good housekeeping must be constantly maintained and supervision must continue to see that all safety precautions and procedures are observed. A new pulping trailer under construction should improve operations and further reduce any possibilities of exposure to asbestos fibers in air.

There is also a set of educational slides available on the subject of asbestos and smoking that should be viewed by all smokers. This set of slides may be obtained by calling extension 1659.

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JOB DESCRIPTION:

Attachment 1

CHLOR-ALKALI II PROCEDURE FOR HANDLING ASBESTOS AND PULPING CELLS

General Procedure for Pulping Cells

After donning proper safety equipment, the operators mix dry asbestos with water in a large plywood box to form a slurry. (The mixing operation requires approximately ten minutes.) The asbestos slurry is carried in plastic buckets to the leaking cells and added by one of two methods: (1) the slurry may be mixed thin and watery and poured through a funnel into the cells for " light pulping" or, (2) it may be mixed thick and viscous for " heavy pulping" , in which case, the thick slurry may have to be forced manually through a hole in the cell cover to plug the leaking cell diaphragm.

Safety Precautions

Use disposable overalls, respirator (MSA No. 8557 with No. 73654 dust pads or Welch Protex No. 7500 with No. 7500-6 dust pads), hard hat, monogoggles, and rubber boots whenever handling asbestos.

Hazards

Airborne asbestos particles getting into respiratory system.

Procedure for Handling Asbestos

1. Wet down sacks thoroughly before opening.
2. Put sack into box and then cut open lengthwise.
3. Use sprayer mounted on front of box to dampen asbestos with water.
4. Remove asbestos from sack, spraying as necessary to keep asbestos particles from flying around.
5. Put empty asbestos sacks into plastic bag and close with tie-wrap.
6. Put buckets into box when filling to prevent spillage, again using sprayer to keep asbestos dampened enough to prevent if from becoming airborne and to wash loose asbestos off bottom of bucket.
7. Carry buckets to cell to be treated.
8. After funnel is in place, put the asbestos into the funnel and put enough water or brine into the funnel to get the asbestos through.
9. Clean up any asbestos that might have spilled and dispose of by putting into same plastic bags that sacks are in.
10. Plastic bags containing asbestos waste are landfilled in the Division's solid waste landfill area.

7/1/77

Attachment 2

MONITORING RESULTS

Sample Number	Date	Job Classification and Description	Sampling Time (min.)	Flow Rate (cc/min.)	Fibers/cc > 5 Microns in Length
1	4/12/77	Operations Specialist pulping cells	50	1800	0.03
2	4/27/77	Senior Operations Technician pulping cells	60	2000	0.03
3	4/29/77	Senior Operations Technician pulping cells	120	2000	0.01
4	5/02/77	Senior Operations Technician pulping cells	110	2000	0.04
5	5/11/77	Senior Operations Technician pulping cells	180	2000	0.07
6	5/12/77	Senior Operations Technician pulping cells	120	2000	0.02
7	5/26/77	Stationary Sample located in Temporary Asbestos Storage Area between skids 4 and 5	330	1700	0.03
8	5/26/77	Stationary Sample located in Temporary Asbestos Storage Area between skids 4 and 5	330	1700	0.05
9	6/01/77	Stationary Sample located in Temporary Asbestos Storage Area between skids 4 and 5	390	1700	0.01
10	6/1/77	Stationary Sample located in Temporary Asbestos Storage Area between skids 4 and 5	390	1700	0.01

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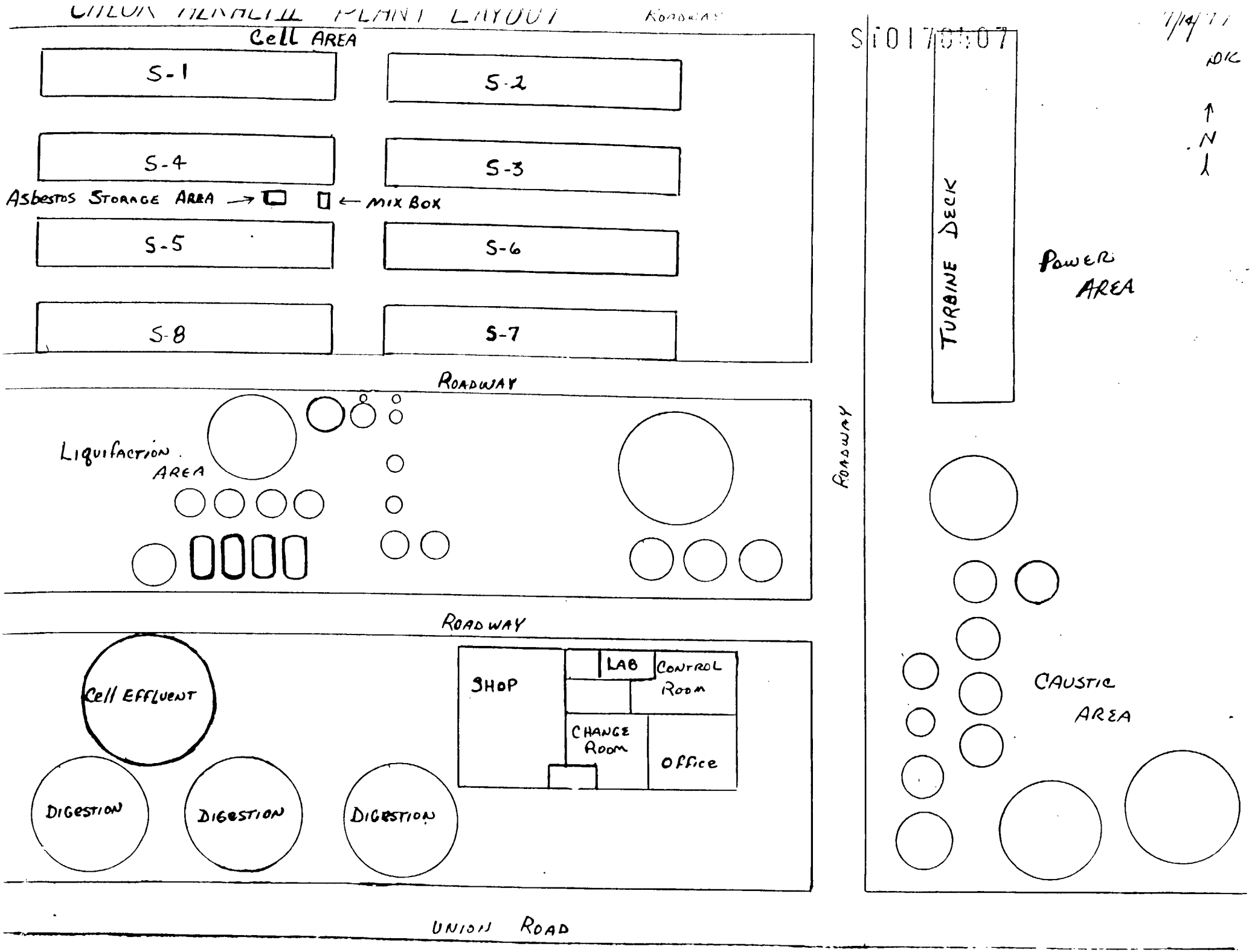
CHLOR ALKALI II PLANT LAYOUT
ROADWAY
Cell AREA
S-1
S-2
S-4
S-3
Asbestos Storage Area
Mix Box
S-5
S-6
S-8
S-7
ROADWAY
Liquifaction AREA
ROADWAY
Cell Effluent
Digestion
Digestion
Digestion
Shop
Lab
Control Room
Change Room
Office
UNION ROAD
ROADWAY
Turbine Deck
Power AREA
Caustic AREA
N