U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION REPORT
HE 79-142-697

MOUNTAIN BELL
DENVER, COLORADO

JUNE 1980

I. SUMMARY

In August 1979 the National Institute for Occupational Safety and Health (NIOSH) received a request to evaluate exposure to a telephone cable filling compound at Mountain Bell, Denver, Colorado. The filling jelly was found to be pure petroleum jelly which posed no health hazard. However, the cleaning of the telephone cable with petroleum spirits did pose a potential health hazard. Workers who splice the small telephone wires in open air, usually at the entrance to a new subdivision, take the ends of the wires and soak them in petroleum spirits that they have previously heated so that it will better dissolve the petroleum jelly. Breathing zone air sample concentrations of petroleum spirits found on the three workers studied were 79, 244, and 110 mg/M^3. Even though the values were below the Occupational Safety and Health Administration (OSHA) standard of 2000 mg/M^3, in underground working conditions, such as in a manhole, workers could be overexposed. Samples taken during this evaluation were on undergroud and above ground workers. During this evaluation workers were cleaning their hands and arms with the petroleum spirits which is a health hazard.

On the basis of environmental data, a health hazard did not exist from airborne exposure to petroleum spirits. The washing of arms and hands with the solvent is a health hazard and should be discontinued. Recommendations on work practices necessary to control potential hazards are included on page 3.

II. INTRODUCTION

NIOSH received a request from Communications Workers of America Local 8412 in Denver, Colorado, to determine if there was a health hazard at

Mountain Bell, Denver, Colorado, from telephone cable filling compound exposure during the installation of underground telephone wires.[1] An environmental survey was conducted on February 27, 1980, to evaluate exposures to petroleum spirits, the only toxic airborne contaminant. All exposure levels and working conditions were discussed with the requestor in March 1980.

III. BACKGROUND

Underground telephone cable is filled with 99.8% petroleum jelly to prevent moisture from decomposing the small telephone wires. When this cable is spliced, workers must clean the petroleum jelly from the small wires. The cleaning was done during this survey with petroleum spirits that had been heated so that it would easily dissolve the petroleum jelly.

IV. ENVIRONMENTAL METHODS AND MATERIALS

Breathing zone air samples for petroleum spirits were collected on organic vapor charcoal tubes using vacuum pumps operated at 50 cc per minute and analyzed by NIOSH Method P&CAM No. 127. The workers were questioned on health problems relating to petroleum spirits overexposures.

V. EVALUATION CRITERIA

A. Environmental

One source of criteria was used to assess workroom concentrations of air contaminants: Occupational Safety and Health Administration (OSHA) standards (29 CFR 1910), January 1978.

	Permissible Exposure Limits 8-Hour Time-Weighted Exposure Basis (mg/M^3)
Petroleum Spirits.....	2000 (OSHA)

mg/M^3 = milligrams of substance per cubic meter of air

Occupational health standards are established at levels designed to protect individuals occupationally exposed to toxic substances on an 8-hour per day, 40-hour per week basis over a normal working lifetime.

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[1]Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 19 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative to employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

B. Toxicological

Petroleum Spirits -- Petroleum spirits are a hazard both by ingestion and inhalation. Ingestion can cause a burning sensation, vomiting, diarrhea, drowsiness, and in severe cases, pulmonary edema. Inhalation of concentrated vapors causes intoxication resembling that from alcohol, headache, nausea, and coma. Hemorrhages into various vital organs have been reported. It is highly dangerous when exposed to heat and heat flame or sparks. (Reference 1)

VI. ENVIRONMENTAL RESULTS

None of the air samples taken for petroleum spirits exceeded the OSHA standard. Levels were 79, 244, and 110 mg/M^3. It would be possible to build up high concentrations of petroleum spirits when working in a manhole or other confined spaces. The workers at the time of this study did have exhaust and dilution ventilation in the manhole. This is evidenced by the low levels of petroleum spirits. Workers were heating the petroleum spirits with various types of makeshift open flame heaters. This is a very serious hazard and should be eliminated. Workers did complain of headaches, dizziness, and nausea when they were working in confined spaces in cold weather. There were no complaints on the day of this evaluation. The sampling results may be reviewed in Table 1.

VII. DISCUSSION AND CONCLUSIONS

A potential health hazard existed at the work place. This conclusion is based on the heating of petroleum spirits with open flame and the washing of hands and arms with petroleum spirits.

VIII. RECOMMENDATIONS

1. The petroleum spirits should not be heated with open flame. An adequate heating system for the petroleum spirits should be installed on all splicing trucks.

2. Hands and arms should not be cleaned with petroleum spirits.

3. Smoking, eating, and drinking must be prohibited in the work area.

4. Workers should wash hands thoroughly before eating, smoking, and snuff usage.

IX. REFERENCES

1. Sax, N.I. Dangerous Properties of Industrial Materials, Fourth Edition, Van Nostrand Reinhold Company, 1975, p. 1006..

X. AUTHORSHIP AND ACKNOWLEDGMENTS

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XI. DISTRIBUTION AND AVAILABILITY

Copies of this determination report are currently available upon request from NIOSH, Division of Technical Service, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from NIOSH, Publications Office, at the Cincinnati address.

Copies of this report have been sent to:

1. Mountain Bell.
2. Communication Workers of America AFL-CIO Local 8412.
3. Communication Workers of America AFL-CIO.
4. U.S. Department of Labor/OSHA - Region VIII.
5. NIOSH - Region VIII.
6. Colorado Department of Health
7. State Designated Agency

For the purpose of informing all employees, a copy of this report shall be posted in a prominent place accessible to the employees for a period of 30 calendar days.

TABLE 1

Breathing Zone Air Concentrations of
Petroleum Spirits
on Telephone Wire Splicers

Mountain Bell
Denver, Colorado

February 27, 1980

Sample Number	Sampling Time	mg/M^3 Petroleum Spirits
8	8:45 AM - 2:00 PM	79
9	8:47 AM - 2:10 PM	244
10	10:05 AM - 2:15 PM	110
	EVALUATION CRITERIA	2000
	LABORATORY LIMIT OF DETECTION mg/sample	0.1