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NA FORM APR 85 1407-B

March 21, 1952. RRR/SJD

Mr. Erbon Mabon, Safety Engineer,
Eagle Picher Company,
Picher, Okla.

Dear Mr. Mabon:

Inclosed is a report of a limited inspection of the rock wool plant of the Eagle Picher Mining and Smelting Company, Joplin, Mo., made by Dr. F. V. Meriwether, of the U. S. Bureau of Mines.

This report is submitted for your confidential information. I shall appreciate any suggestions or comments you may have and shall be glad to have my attention called to any errors or misstatement of fact.

Yours faithfully,

SCOTT TURNER

SCOTT TURNER,
Director.

Inclosure No. 4555

cc - Dr. Meriwether

W O F Files

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REPORT OF DUST INVESTIGATION OF THE EAGLE PICHER ROCK WOOL PLANT at JOPLIN, MISSOURI

In September, 1931, at the request of the Safety Engineer of the Eagle Picher Mining and Smelting Company, an inspection was made of the company's rock wool plant at Joplin, Missouri. This plant is operated in connection with a lead smelter and the product is made from by-products of lead smelting. Inasmuch as the rock wool plant is only operated when there is a demand for the product, considerable delay was encountered in assembling and collecting all data on the process. It was desired to obtain information on the dust, its chemical analysis, and to examine the older men employed at the plant in order to draw conclusions as to possible harmfulness of the dust.

Rock Wool. Rock Wool is made from slag which is heated to a molten liquid and is blown out of a small orifice at considerable pressure into the stream, breaking the molten liquid into very fine hairlike particles. This is blown into a large room and after collecting in quantities it is shoveled into containers for transferring to another building for fabricating. The material is made into sheets, bricks, and is combined with asbestos and used for the purpose of insulating buildings, furnaces, etc. In both the buildings in which the furnace and the fabricating rooms were located, large amounts of dust were detected in the air.

Dust Count. Atmospheric samples were taken in the mixing room, fabricating department, granulator and furnace rooms. The sample in the furnace room shows 25,000,000 particles under 10 microns; in the mixing room No. 2 samples shows 23,000,000 particles; No. 1 sample 10,000,000 particles; the fabricating room shows 1,000,000 particles; and the granulator 4,000,000,000 particles, all under 10 microns. Two of these samples were forwarded to Pittsburgh, Pennsylvania, for analysis (furnace room and mixing room No. 2) and the figures given above are the figures obtained at Pittsburgh. Our own figures show a much higher count. It is possible that some of the particles have gone into solution.

Chemical Analysis. Samples of the rock wool were sent to Pittsburgh to Mr. W. A. Selvig for chemical analysis and the analyses are as follows:

#1 PARTIAL ANALYSIS

	Per cent
Lead, Pb	1.6
Silica, SiO_2	34.6
Aluminum oxide, Al_2O_3	6.3
Ferric Oxide, Fe_2O_3	34.4
Calcium oxide, CaO	13.3

#2

Lead, Pb	0.5
Silica, SiO_2	40.8
Aluminum oxide Al_2O_3	5.9
Ferric oxide Fe_2O_3	31.6
Calcium oxide CaO	13.3

#3

Lead, Pb	0.7
Silica, SiO_2	42.0
Aluminum oxide, Al_2O_3	6.0
Ferric oxide, Fe_2O_3	29.2
Calcium oxide, CaO	12.0

The concluding statement of Mr. Selvig's report is as follows: "As mineral wool is a slag and has been thoroughly fused it may be quite irritating if breathed into the throat and lungs in the form of dust."

Physical examinations. On January 6, 1932, four of the employees working at the plant were examined at the clinic to determine whether or not they show evidence of lung involvement. Three out of the four men examined show a decidedly more fibrosis than normal, and one of the three shows an old tuberculosis. The other man was negative. The histories of the men show that they have not been employed steadily in this plant, but they have been engaged in this work for periods ranging from 9 months to 1½ years, probably at about half time. The man that shows no thickening in the bronchial tubes is the foreman who is probably exposed to the minimum amount of dust.

Conclusions drawn. Based on the chemical analysis, quantity of dust, and evidence of such peribronchial thickening in the men who have been exposed, according to the histories, only a relatively short period of time to the dust, it is very likely that the dust is harmful if breathed over a relatively long period of time. This is particularly true in the mixing room where it is stated by the employees that rock wool is mixed with asbestos in various mixtures ranging from 10 to 75 per cent. This is a particularly dusty place, and it is now known definitely that asbestos dust is one of the most dangerous dusts to which man is exposed. With the combination of asbestos and a fused silica dust, known to be irritating to the lungs, it is reasonable to

conclude that the man will get extensive fibrotic changes in a relatively short period of time. This is particularly true where the rock wool is mixed with asbestos. A study of the X-ray pictures of these men fails to reveal any silicosis at the present time, but to produce a decidedly more fibrosis than normal condition in the mines in the Picher field, the group shows an average working time of six years; in other words, apparently these men have contracted the same amount of fibrosis in 12 months or less that occurs in the mines of the Picher field in approximately six years. Assuming this to be correct, the evidence, while not complete, would lead to the conclusion that the dust encountered by these men is more dangerous and will produce lung involvement in a very much shorter period of time than the dust which is encountered in the Picher mines.

Dust Control. Machines should be introduced to control the amount of dust produced at this plant. In the furnace room, where the wool is blown into the room, a method of sucking the dust out of the room or an upward system of ventilation should be installed. In the fabricating room, it should be as open as possible, and a definite dust-controlling system installed. In the mixing room, it is suggested that a machine be installed to do this mixing, sacking, etc., similar to that used by cement industries, and it will not be necessary for the two men to be in the room. These machines are in common use and could be used here with economical results.

UNITED STATES DEPARTMENT OF COMMERCE

BUREAU OF MINES CO-OPERATIVE CLINIC

PICHER, OKLAHOMA

March 11, 1932.

Dr. R. R. Sayers,
Chief Surgeon,
Bureau of Mines,
Washington, D. C.

Dear Dr. Sayers:

I am enclosing copies of the report on the investigation of the Eagle Picher Company's Rock Wool Plant in Joplin, which we discussed while you were here.

When this is finally approved, please forward a copy to Mr. Erbon Mabon, Safety Engineer, Eagle Picher Company, Picher, Oklahoma, at the earliest possible date, as they are very anxious to receive it.

Yours respectfully,

F. V. Meriwether

F. V. Meriwether,
Surgeon in Charge.