Mill City (Central) District

The Mill City or Central district is in the Eugene Mountains in north Pershing County near the Humboldt County border.

Silver and copper ores were mined in the Eugene Mountains in the early days. The first discovery in the Central district was made by L. Vary in 1856, when the 56 Copper mine 7 miles west of Imlay was located. Copper ore was produced in this mine in 1917. The production of precious metals from the Eugene Mountains has been very small in recent years.

Tungsten ore was discovered in 1917 by Emil Stank on the southeast slope of the Eugene Mountains about 8 miles west of Mill City. Two concentrators were built in 1918 - one by the Nevada Humboldt Tungsten Mine Co. and the other by the Pacific Tungsten Co. The Nevada-Massachusetts Co. purchased the Pacific Tungsten Co. in 1924 and later acquired the Humboldt Tungsten mine. In May 1925 the Nevada-Massachusetts Co. began operations that have been continuous since then, except for a short period in 1932 when production was suspended because of no market. From 1925 to March 1, 1936, 510,000 tons of scheelite ore have been produced that averaged nearly 1 percent WO_3. Operations prior to the Nevada-Massachusetts Co. activity are estimated to have yielded 50,000 tons of scheelite ore. The property of the Nevada-Massachusetts Co. comprises 13 claims in one group. Production is about 240 tons of ore per day; 100 men work in the mine and mill. Mill City ranks among the important tungsten-producing areas of the world, and since 1925 it has been the largest producer in the United States.

The geology of the tungsten deposits has been described by Kerr.[8/] Development consists of two inclined shafts with levels at 100-foot intervals. In 1936 each shaft was about 1,000 feet deep as measured on the incline.

The tungsten occurs as scheelite associated chiefly with quartz, garnet, and epidote. The formation comprises a series of sedimentary rocks of shale, slate, and quartzite that have been intruded by granite. The ore bodies are veinlike in form but have been produced by contact metamorphism of thin limestone members in the sedimentary series.

Two limestone beds, the Sutton and the Stank, have been developed. Figures 3 and 4 show plans and vertical sections of the Humboldt and Stank mines. In March 1936 the deepest workings were nearly 1,000 feet below the surface. The Stank has been the most productive bed; it averages 4½ feet in width. The beds dip 75° and are well-adapted to mining by shrinkage stoping. The ore, although hard, breaks well, and the walls require little support. The beds are mined in sections, each stope section being 75 to 80 feet long. Chute raises are driven at 15- to 20-foot intervals. Machine drilling is employed.

The concentrator has a daily capacity of 240 tons. Figure 5 shows the flow sheet. The scheelite ore is treated by gravity- and magnetic-concentration methods. The scheelite is unevenly disseminated as small grains in gangue composed principally of garnet, epidote, quartz, calcite, and pyrite. Some of the gangue minerals are more tenacious than the scheelite and in grinding tend to pulverize the scheelite, which is brittle. The aim in crushing the ore is to liberate the scheelite with a minimum of sliming; this is accomplished by stage reduction with rolls.

Power for milling and mining is purchased from the Sierra Pacific Power Co. at an average cost of 2 cents per kilowatt-hour. Water for milling is obtained from the mine workings and from a well 5 miles east of the property near the Humboldt River.

The direct cost of milling is about $1.25 and of mining $3.15 per ton, or a total of $4.40. This cost does not include marketing, amortization, and other indirect costs.

8/ Kerr, Paul F., Geology of the Tungsten Deposits near Mill City, Nev., March 15, 1934: Univ. Nevada Bull., vol. 28, 1934.

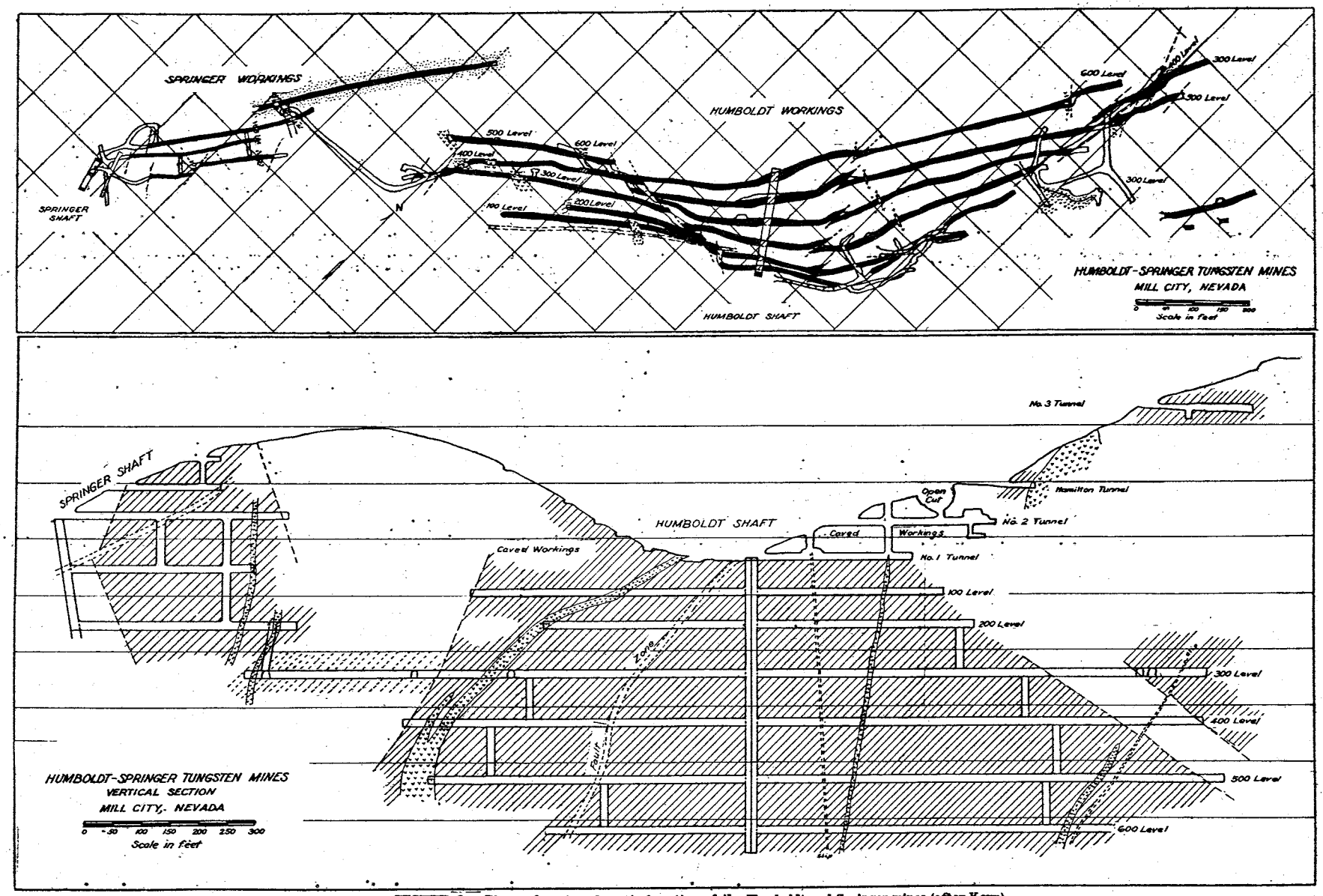

FIGURE 3.— Plan and projected vertical section of the Humboldt and Springer mines (after Kerr).

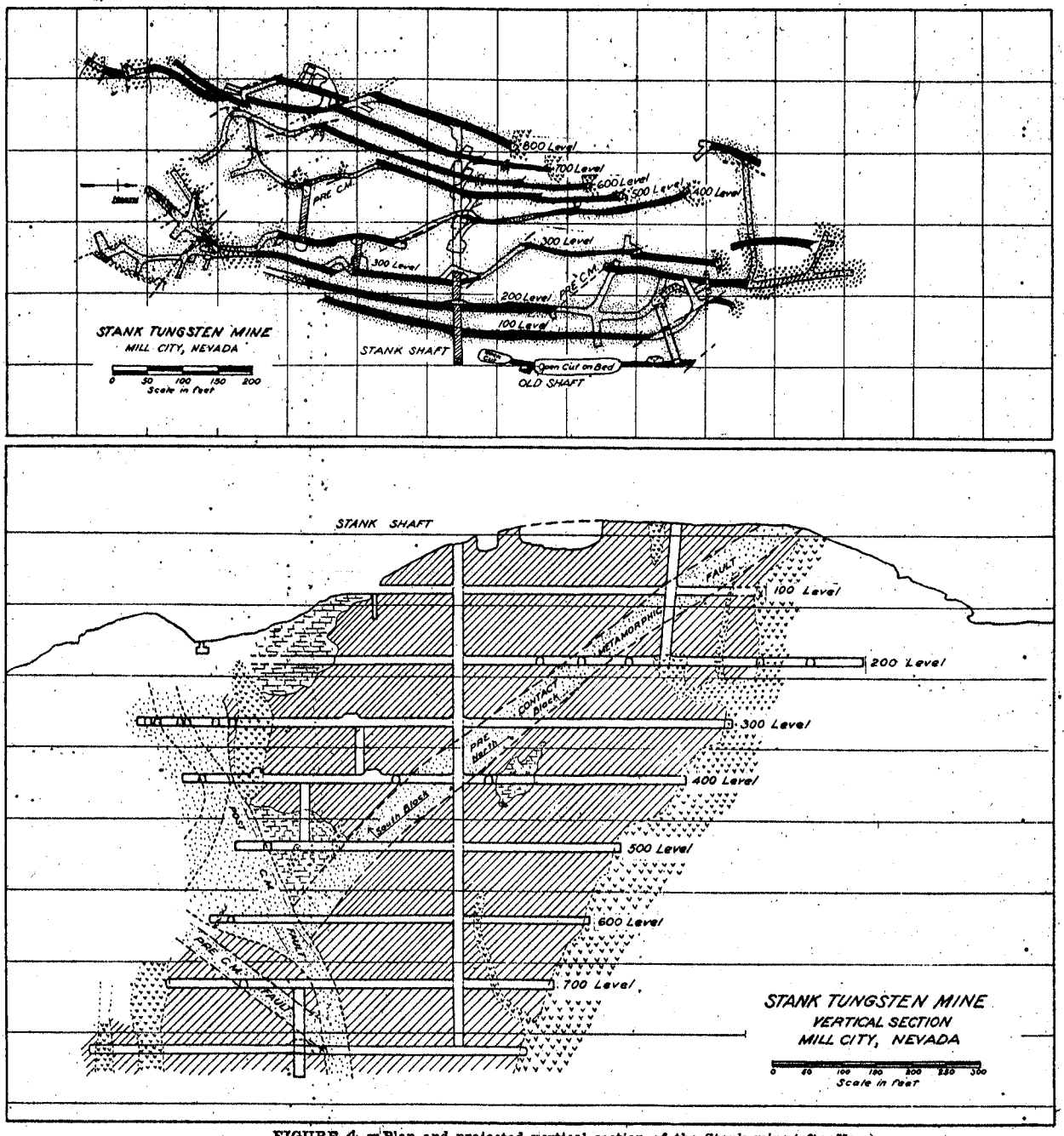

FIGURE 4.—Plan and projected vertical section of the Stank mine (after Kerr).

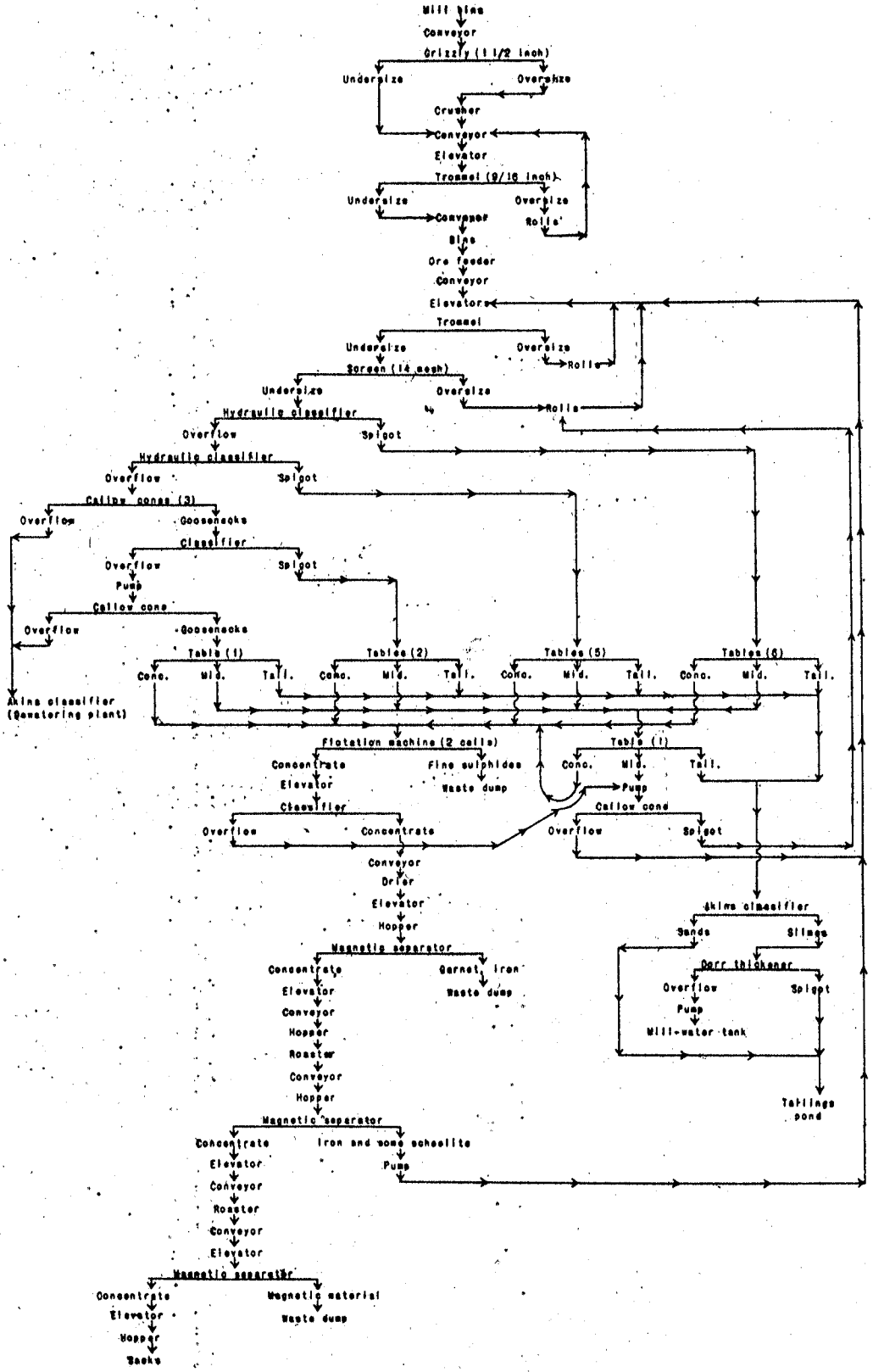

Figure 5.—Flow sheet of Nevada-Massachusetts Company's tungsten concentrate, Mill City District, Nevada.