mine, high on Silver Hill, showed a "ledge" six feet wide, three feet of it good ore, in 1883 (Report on Precious Metals in the U.S., 1884). This area apparently was most productive in 1880 - 1900, with little work since. As indicated on the maps, numerous tunnels pass beneath this area; their dumps show mainly barren, weakly argillized to fresh andesite. This, plus exposures in Esmeralda Gulch, suggest that veins and mineralization died out with depth.

A few small stopes are also evident on Middle Hill. The Durand shaft was sunk to 500 feet (Vanderburg, 1936) by an English company in the 1885-1895 era (Spence, 1958, p. 245). Its dump, and the dump of a major adit to the northwest, contain many small quartz veinlets in pyritized, weakly argillized andesite. Sample 2315-10, from the Durand dump, shows 2.7 ppm Au and 5 ppm Ag. Goldfield Consolidated surveyed and sampled the shaft to 175 feet (water level) in 1914, obtaining "encouraging assays". They concluded that the ore shoot reported in the flooded workings below was too short to justify dewatering, even though it was of good grade. (Superintendent's Report, July 20, 1914).

Humboldt and Prospectus Veins

Humboldt Hill contains the most extensive stopes in the district. Northeast of the Goldfield Consolidated glory holes, deep old timbered stopes can be followed for perhaps seven hundred feet along strike. Typically these were four to seven feet in width, and in the footwall of a large quartz vein. Nails and artifacts suggest operations here were prior to the 1890's. Farrell

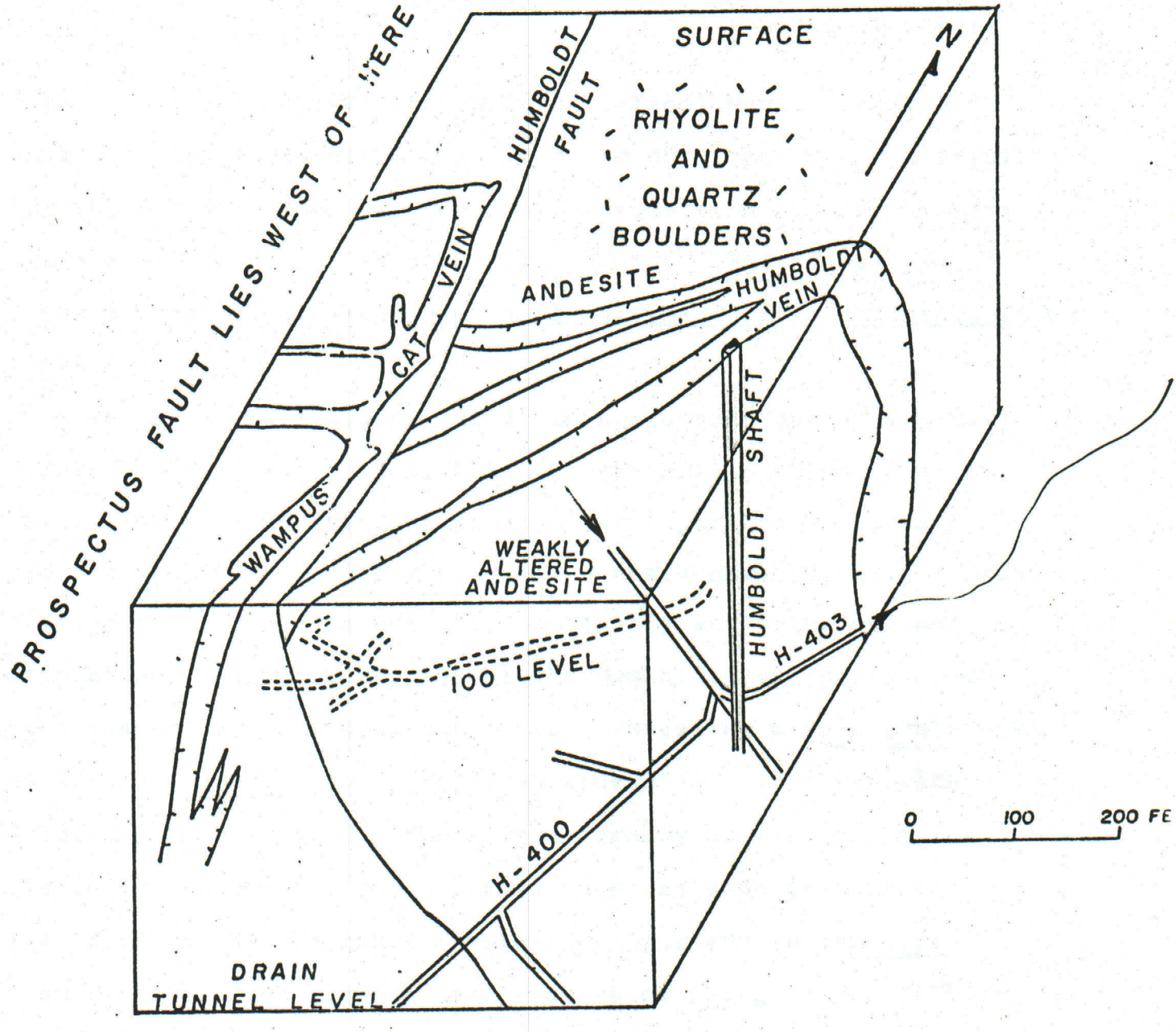


FIGURE 2 ISOMETRIC PROJECTION OF THE CENTRAL SECTION OF THE HUMBOLDT VEIN, HUMBOLDT HILL. STOPING NOT SHOWN. AREA WEST OF THE SHAFT IS NOW A GLORY HOLE. MODIFIED BY L.P.JAMES FROM H.N. WITT 1915.

(Ibid,1934) states that the English Real del Monte operators sank the Humboldt shaft to 400 feet and developed several levels but the ore developed was too low in grade to mine. He reports their economic cutoff as about $12 per ton. This developed reserve apparently formed the basis for the Goldfield Consolidated operation.

The J. S. Cain Consolidated Mining Company operated a mill apparently north of the mouth of the Prospectus tunnel, in the early 1900's. The Jesse Knight interests purchased the Cain properties, and extended the tunnel beneath Humboldt Hill. Crosscutting toward Last Chance Hill apparently was begun but not completed. The northerly end of the Humboldt vein system had been reached by crosscuts and raises, revealing a vein system 40 to 70 feet wide on four levels, when negotiations began with Goldfield Consolidated. The latter company hurriedly sampled the workings, finding the upper levels were "as good as expected", i.e. about $5.00 per ton.* Crosscuts on the 400 (Prospectus tunnel) level were still in the process of being driven (Albert Burch to George Wingfield, April 4, 1914). After a hurried examination by Searles, Goldfield purchased stock control of Aurora Consolidated for $763,000 and other considerations. Large raises were begun to get up into other portions of the ore, apparently branching parallel to the main vein system. Results were disappointing - "very little quartz was encountered", the ore had a greater clay content than anticipated in mill design, and grade was 15 to 20 percent lower than anticipated (superin-

* .24 oz/T Au

Geological data on the Humboldt underground workings is scarce. Descriptions from annual reports and a small isometric diagram indicate that the Humboldt vein split into three narrower fingers or branches west of the Humboldt shaft. These terminated, some 400 feet west of the shaft, against the Humboldt fault, and the small Wampus Cat vein, striking north south. This vein is believed to crop out on the north side of Humboldt Hill, and was "high grade" sampled at the surface (no. 2307-2). From the third level of the Humboldt shaft the vein contained a four foot streak averaging $4.50 per ton. The Humboldt vein was also mined west of the Wampus Cat.

East of the Humboldt shaft, ore averaged $3.20 per ton in 1916. A raise from haulage level to the surface indicated "much better ore" on the adjoining Silver Lining claims. Exploration below the haulage level was limited to one winze, sunk 100 feet near the northeast endline of the property. "Neither the winze nor the lateral work there-from disclosed any ore" (Goldfield Cons. report for 1916, p. 29).

The Prospectus section of the vein, west of the Prospectus fault, apparently produced considerably less ore. In 1916 there were 30,000 tons of blocked out and broken ore in this section, presumably in the area now occupied by the water-filled open stope. Underground exploration southwest of this area is not indicated by existing maps.

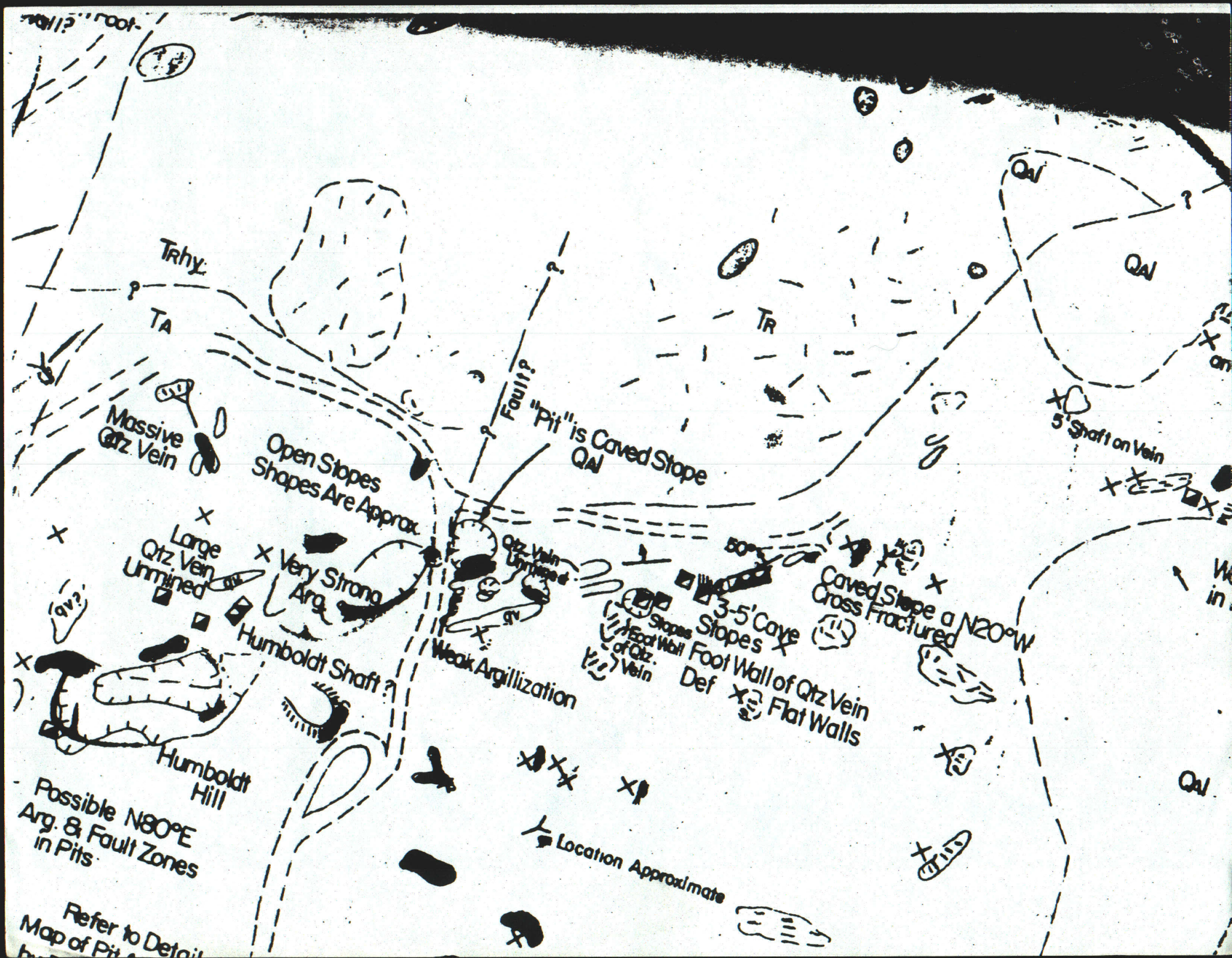
In August 1917 it was realized that the Humboldt, Prospectus and Last Chance hill properties would not yield a profit to Goldfield Consolidated. The Silver Lining claims (now held by Summa Corp.) to the northeast of the Humboldt workings were optioned late in December 1917. The haulage level was extended into this ground, on which "very little development work" had ever been done, and production of 75,000 tons of $8.00 ore was anticipated from existing exposures. (Report for 1917, p. 14). However, further development work failed to expose payable ore (Report for 1918, p. 10) by the time scrapping of the plant commenced in the fall of 1918.

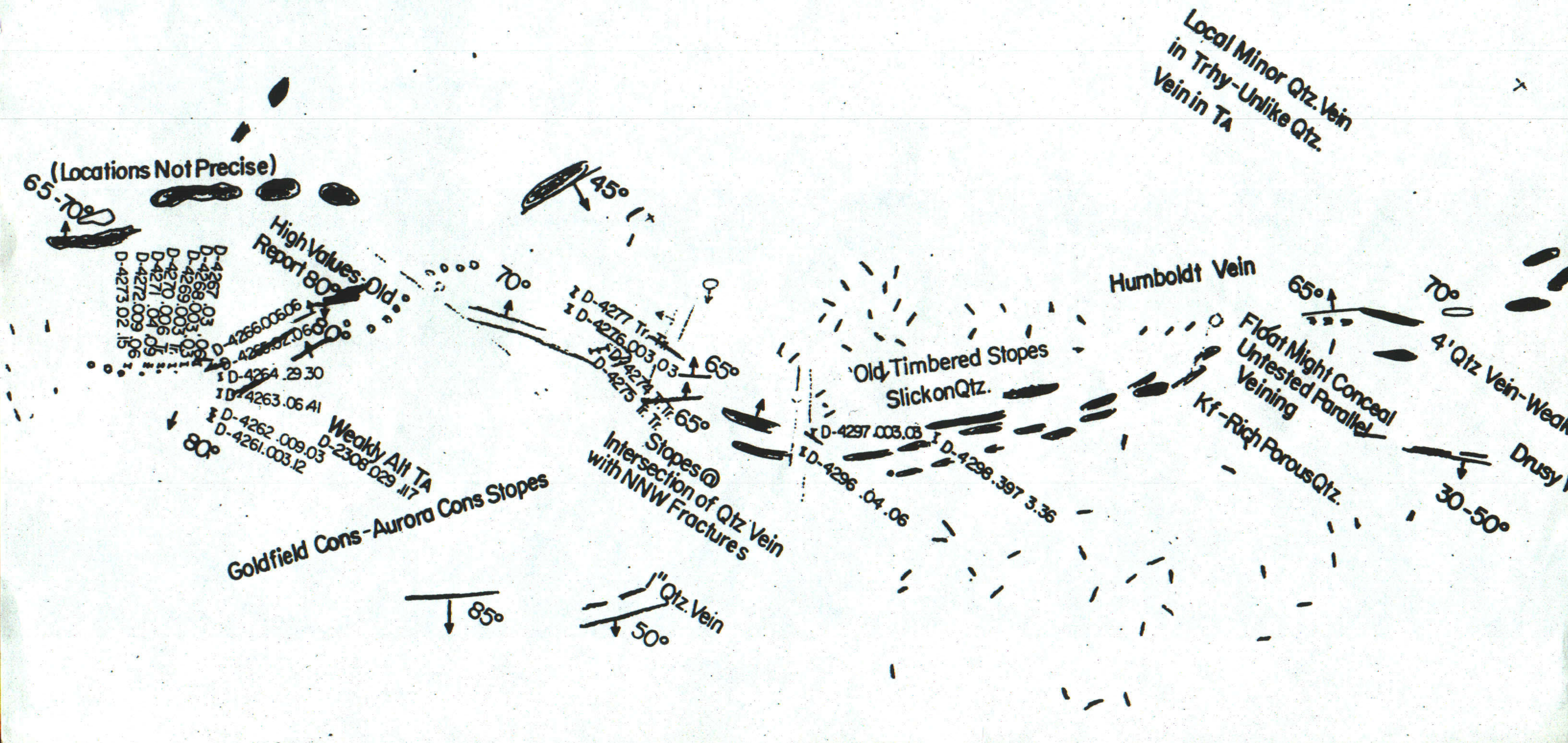
With the exception of crosscutting to the Juniata vein, exploratory work by Goldfield Consolidated was largely limited to the Humboldt Hill area. According to Farrell (ibid, 1934) "records show that only 1 foot of development was done for 40 to 50 tons mined" during Goldfield's operations in the district.

IV SUMMARY AND CONCLUSIONS

High grade gold-silver ores have been produced from within and adjacent to epithermal quartz veins in the Aurora district. Ore within quartz veins was partially limited to shoots, apparently controlled by north to northeast striking structures postdating initial veining. In some localities, most notably on Humboldt Hill, the entire vein structure and associated wall rock were mined as low grade ore.

Last Chance Hill, often the center of attention in the district, was characterized by small, high grade, probably secondarily


TRhy.
TA
TR
Fault?
"Pit" is Caved Stope
QAl
Massive Qtz Vein
Open Stopes
Shapes Are Approx.
Large Qtz Vein Unmined
Very Strong Arg.
Humboldt Shaft ?
Weak Argillization
Humboldt Hill
Possible N80°E Arg. & Fault Zones in Pits
Refer to Detail Map of Pit
Location Approximate
Qtz Vein Unmined
Stopes
Foot Wall of Qtz. Vein
3-5' Cave Stopes
Def
Foot Wall of Qtz Vein Flat Walls
Caved Stope a N20°W Cross Fractured
5' Shaft on Vein
60



Local Minor Qtz. Vein in Trhy-Unlike Qtz. Vein in TA
(Locations Not Precise)
65-70°
High Values: Old Report
80°
D-4267 .03
D-4268.003 .03
D-4269.003 .03
D-4270.006 Tr.
D-4271 .04 .09
D-4272.009 .06
D-4273.02 .15
D-4266.006.06
D-4264 .29.30
D-4263.06.41
D-4262 .009.03
D-4261.003.12
D-2308.029 .117
Weakly Alt TA
Goldfield Cons-Aurora Cons Stopes
70°
45°
D-4277 Tr.
D-4276.003.03
D-4274
D-4275 Tr. Tr.
65°
Stopes@ Intersection of Qtz Vein with NNW Fractures
85°
"Qtz. Vein
50°
Old Timbered Stopes
Slickon Qtz.
D-4297.003.03
D-4296 .04.06
D-4298.397 3.36
Humboldt Vein
65°
70°
Float Might Conceal Untested Parallel Veining
Kf-Rich Porous Qtz.
4' Qtz Vein-Weak
Drusy
30-50°