CHAPTER 3. THE HOMESTAKE MINE (24PA875)

-- On the following day I left for the New World District, where I arrived in good time. During my stay in the camp, I recorded several claims...This time I remained but a few days as winter had already set in in the shape of a 4 inch snow, with a very fair prospect of being several feet in a short time, & this on the 12th day of August, 1872.

-A.B. Henderson, August 12th, 1872

from:

"Journal of Various Prospecting Trips, Stampedes, and [etc.]
During the years 1871 and 1872"

Description

This site was a significant mining operation in the New World Mining District between 1887 and 1929. The mine was in operation from 1887 to about 1890 and again from 1921 to 1929, with limited open pit mining occurring in the late 1940s. It was associated with the Gold Dust Mine (24PA874) and was connected to that mine by a 700-foot long aerial tram (24PA879). Most, if not all, structures remaining at the site are associated with the 1921 to 1929 period of operation.

Western Smelting and Power Co. (or its predecessors) acquired and developed the Homestake Mine and its related workings, starting in 1916. There are a total of four adits and a small amount of open pit excavation on the Homestake claim. Three of the adits are now collapsed and buried; one of these can no longer be identified. A raise connected the longer of these two adits. The total length of all four adits and associated cross-cuts and drifts is less than 700 feet. The lower adit portal lies at about 10,000 feet in elevation and was driven about 225 feet to the southwest. The longer of the upper adits was driven almost due south for about 350 feet. The remaining two adits were driven at about the same elevation as the upper adit and are each about 50 feet in length. The Homestake lies almost directly above the Gold Dust, with the workings separated by about 400 vertical feet of elevation. Both were driven in vain searching for the ore body within the Homestake Breccia Deposit. The main Homestake Adit, with the top of the winze exposed in the floor of the workings, has been closed with wooden timber portal sets and a locking steel gate. The other adits are closed with backfill or rock fall material at the portals (Kirk 2002). The site is in excellent condition with most of the structures associated with the mine still remaining. All structures retain fair architectural integrity and historical associations.

Physical remains at the site consist of an open adit, an area of open cut workings, a loading terminal for the upper tramway, a trestle, and a ore bin and load out. Figure 3-1 is a photo of the site taken from the opposite side of the Fisher Creek Valley, showing the major features of the site. Figure 3-2 is a map of the Homestake Mine Site (24PA875). Figure 3-3 is a map of the workings from Lovering (1929).

Feature 1 is the remaining open adit that opens to the northeast and is located on a steep north-facing mountainside (Figure 3-4). The adit has been closed with wooden timber portal sets and a locking steel gate. Feature 2 is an ore load-out and pilothouse. It measures 19.6 x 32.8 feet and is oriented southeast to northwest. It has heavy wood beam construction with vertical board and batten siding on the load-out and pilothouse. The ore chute has wood walls and faces northeast, while the pilothouse has a shed roof with exposed rafters supporting the overhanging eaves. Windows are on the southeast and northwest walls. The northwest window has a portion of window frame intact indicating that they were casements. The structure is built into the mountainside on a heavy wood frame foundation. Horizontal board and batten siding is on the facade of the load-out. This structure might have loaded trucks, for transport by road, or ore cars for transfer to the tram-loading terminal, designated as Feature 3. Figures 3-5 to 3-7 show the load out structure.

Feature 3 is the upper tram loading terminal. It had heavy wood beam construction with trusses. The tipple has horizontal board siding, while the tram operator's house is flat-roofed with vertical board and batten siding. Entry is gained on the south (structure faces north). A single window is located west of the entry on the rear facade. The entry was reached by a wood deck that is now collapsed. There is board roofing on the terminal and the entire structure has a wood beam foundation. A tram cable support on the northwest side of the structure consists of wood trusses and metal cable guides. The bull wheel and break wheel are intact in the terminal, along with a reduction gearing system (possibly a speed retarding mechanism) and an ore feed chute with its control mechanism. The cables are lying more or less in place and can be seen leading down the steep slope to the Gold Dust Mine (24PA874) some 700 feet below. The entire structure is deteriorated. Figures 3-8 to 3-11 show the tram loading terminal.

Feature 4 is a wood ore car load-out trestle with narrow gauge rails oriented northeast to southwest (Figure 3-12). It is deteriorated and is associated with the main adit (Feature 1). Feature 5 is an area of open pit mining. Located about 60 feet above the buildings, this area is accessed by a switchback road. It is hard to tell the extent of this open cutting as there may be some subsidence from the collapse of the adits and much of the natural rock fall and talus is hard to discern from the mine workings. Features 6, 7 and 8 are collapsed adits. These are nearly covered by subsequent workings or rock falls.

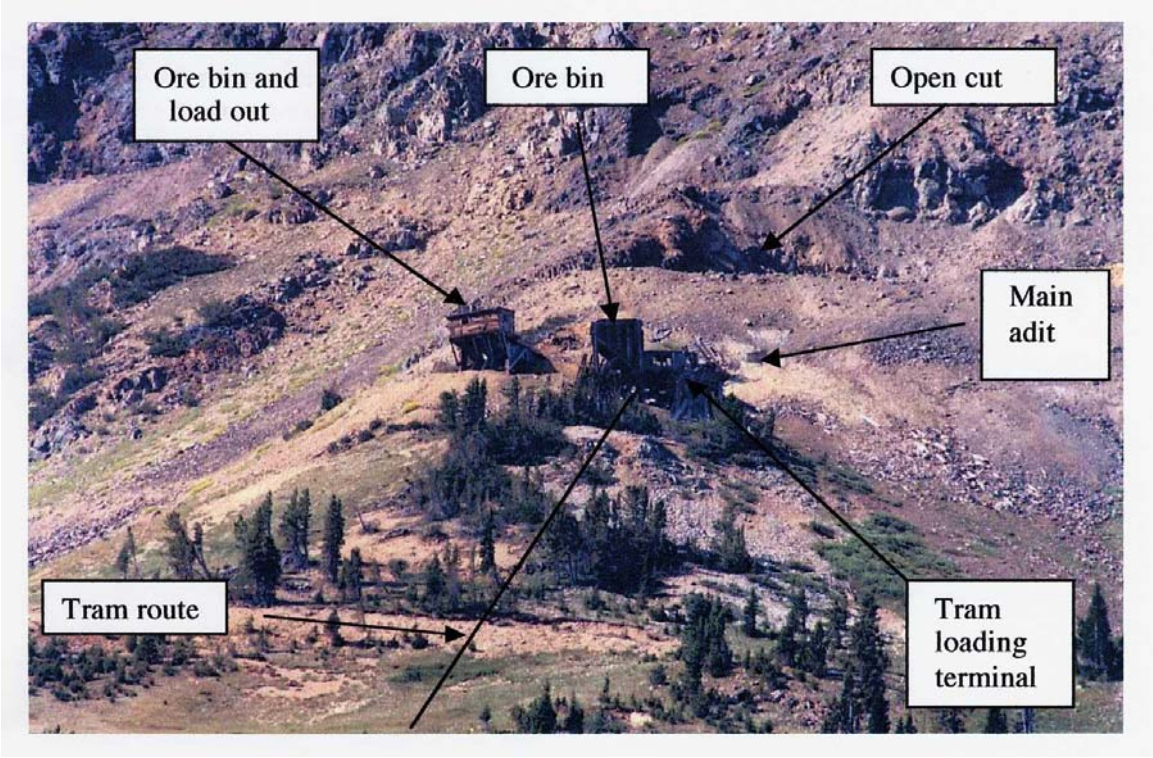

Figure 3-1. Overview of the Homestake Mine (viewing south) showing the major features of the site.

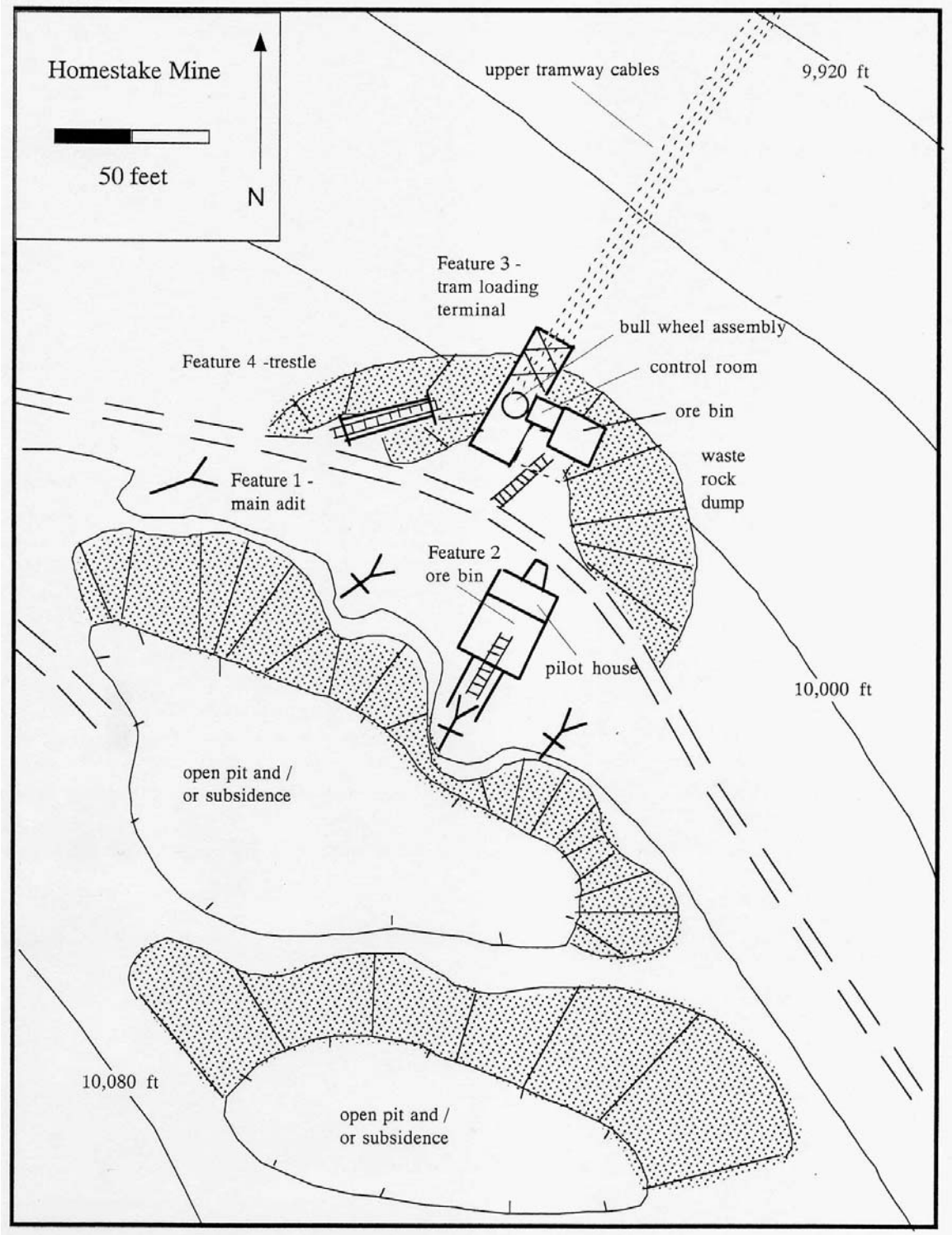

Figure 3-2. Sketch map of the Homestake Mine.

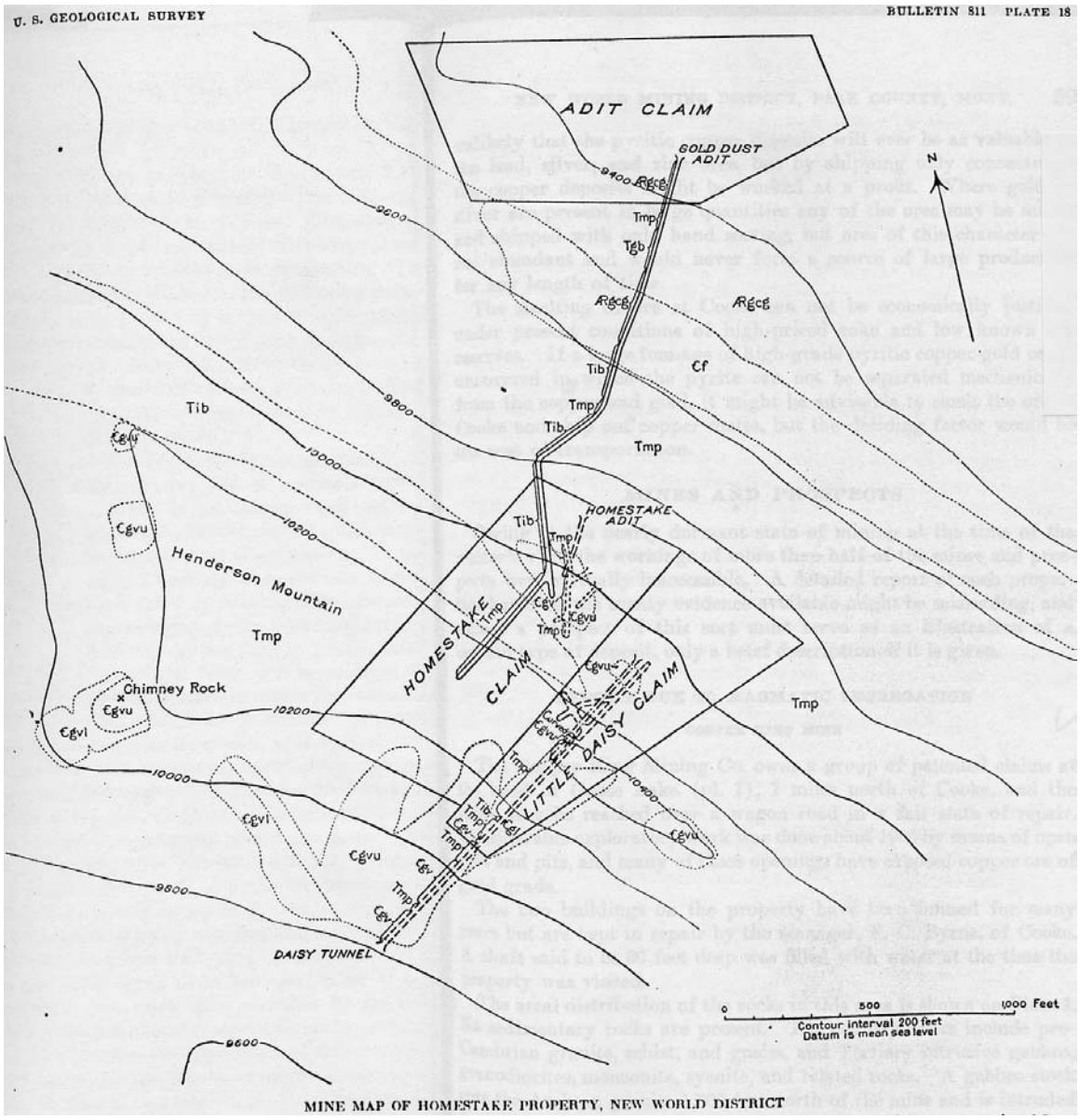

Figure 3-2. Sketch map showing relationship of the Homestake, Daisy and Adit [Gold Dust] Mine workings (from Lovering 1929).

Figure 3-4. Feature 1, main adit looking south.

Figure 3-5. Feature 2, ore load-out and pilothouse, looking southeast.

Figure 3-6. Feature 2, ore load-out and pilothouse, looking northeast.

Homestake Mine History

This mine can be traced back to 1885 when Sam Mathers filed a claim on what became the Homestake Mine. Two years later, Mathers shipped 30 tons of ore from the mine to a smelter in Salt Lake City. The ore netted him $3,000 and encouraged him to continue work on the mine's three adits, numerous crosscuts and minor drifts. A shop and shed were constructed near the intermediate level adit. The gold and silver mine was one of 279 mining claims in the New World District and, along with the Alice E. and Daisy Mines on the opposite side of Henderson Mountain, was one of the most productive. A tent camp (24PA919) located below the mine may have been associated with the workings in the late 19th century. By 1894, mining at the Homestake had ceased in the wake of the Silver Purchase Act and the resulting national depression (Fredlund, et al. 1990).

To accommodate the miners and their families, Mathers constructed a small tent camp approximately 100 yards northwest and below the mine. The history of this camp is vague. The occupants probably worked for a season or two at the Homestake Mine. The tent camp, 24PA919, is located on a small, relatively flat ledge on Henderson Mountain about 200 feet below the Homestake Mine. The land drops steeply below this ledge overlooking the Fisher Creek drainage. The site consists of cleared and leveled areas for at least nine tents, a collapsed frame structure, a small waste dump and prospect shaft. The site area is roughly 440 feet x 110 feet (Fredlund, et al. 1990).

One 20 by 24 foot structure may have burned as there is a lot of melted glass about but no logs. It may have been the blacksmith shop. Rocks are piled up and may have been part of a foundation for a tent platform. Another irregularly shaped structure measures 28 x 18 feet, and is divided into two areas. A rock wall and a chopped log are located inside, possibly as central platform supports. In addition there are eight leveled areas measuring about 15 x 20 feet. These are probably tent locations. A cluster of crucibles lies near one of the tent platforms. Artifacts observed at the site include stove parts, soldered food cans and applied-lip bottle glass consistent with an 1880s-1890s occupation (Fredlund 1992).

The features and artifacts of the camp make it an historic archeological site of 1880s mining occupation. The tent camp is significant as a component of the Early Development Period of the New World Historic Mining District, and clearly predates the WS&P period of involvement.

The daily life of the tent camp occupant must have been almost unbearable by current standards. A summer night spent in an unheated cabin in Cooke City, 2500 ft below this location, is best described as uncomfortably invigorating. At this elevation, in a tent, it would have been truly inhospitable. With less than 30 annual frost-free nights, frequent high winds and severely inclement weather possible at any time, tents would have been quite inadequate. The ubiquitous cast iron stoves were tended all night. Artifacts suggest the occupants enjoyed a diet of canned food (replete with gradual lead solder poisoning and not uncommonly, salmonella) washed down with plenty of liquor and "Dr. Hostettler's Stomach Bitters." Baking powder and flour were staples and fresh game meat was procured whenever possible.

Camping at this elevation is difficult after even a short while; to live here for an entire season while working long days at mining is really difficult to imagine. The following excerpt describes the process that would have been employed during the early period of mining at the Homestake, prior to the arrival of capitalization and an infrastructure to support compressed air drills:

> [Hand] drilling was conducted by hand sledging of simple steels. These sledges were eight-pound double jacks if worked two-handed; four-pound single jacks if worked one-handed. A lone miner single-jacked, holding and turning the steel with his left hand while smiting with his right. Two or three men constituted a double–jack team, one turning (or shaking) while the others pounded away in disciplined, rhythmic succession. The steels themselves were merely rounded or octagonal rods with a plain slightly flaring chisel-bit tip. They came in sets whose tip flares grew progressively narrower as the length increased. The starter, or bull steel, was about a foot long, while each change grew by about 6 inches of length. A three-foot length was about the maximum...The steel dulled and had to be sharpened or replaced at an average of about every six inches drilled. At the end of a shift the worn steels were bundled up by the mine's blacksmith for resharpening and re-tempering [itself a complex process of heating and cooling the steel and reshaping the tips] (Young 1970).

Blasting occurred usually at the end of a shift, followed by mucking (the removal of blasted debris). On a typical small mine, the duties of blacksmith, miner, blaster and mucker were carried out by the same person(s). The rate of progression of a hand-drilled adit was roughly 12 inches per day. Air powered tools yielded around five feet every two days. A large percentage of the early period miner's time was spent sharpening drilling steel. A blacksmith shop was an essential component of any small mine. Small operators could not afford a large supply of drilling steel, so tools were dressed at the beginning of each shift. By the time of WS&P's involvement, a full-time blacksmith would have been employed and a week's supply of (higher quality) drilling steel might be ready at any given time (Hoffman 2002, Young 1970).

That the Early Development Period at the Homestake Mine was most likely only a seasonal operation is dictated by the elevation and extreme exposure of the site. The historical average snow fall in Cooke City is 300-500 inches. At the proposed Crown Butte Mines facility in Fisher Creek, monitors recorded an average of 15 feet maximum accumulation (Noranda 1991). Snow pack does not disappear from the site area until mid to late July. In winter, travel is by snowshoes or skis. Many of the district's mines did operate in the winter, however. Supplies came to the mine by contractors such as Martin Ramnael, a Norwegian, who carried packs of 70 to 120 pounds from Cooke City. He could make one round trip per day to the Tredennick Mines, located across the valley from the Homestake. In winter, passages were dug through the snow between one building and another. Candles and lamps were burned night and day for light. The winter of 1886-1887 was particularly difficult. Extreme snowfalls were wiping out Montana's cattle herds on the plains, and getting food and supplies to the remote alpine mines of the New World District was extremely difficult. Even the game had departed for lower elevations early and had stayed on their winter range longer than usual (Wolle 1963; Glidden 1976).

Avalanches were a great danger to the historic miners and still figured prominently in the Crown Butte Mines feasibility study of 1991. On New years Day, 1887, Nick Tredennick, foreman at the Republic Mine and later developer of the Tredennick Company group of mines, had been helping a crew dig out from an avalanche that had buried the portals of two adits. He was standing 75 yards from a group of men who were finishing the task when a second avalanche roared down, sweeping them away. Tredennick was carried fifty feet and stopped against a tree, but two other men were carried across the valley floor. One body was found the following June, the other was not found until July 4. The majority of the men had just retired to the bunkhouse when the accident occured, the slide missing them by a few feet. So unnerved was the crew that most of them quit after the incident (Wolle 1963; Glidden 1976).

By 1916 the Western Smelting and Power Company had purchased the Homestake Claims, along with the Gold Dust Vlaim located 700 feet below, and planned extensive development of both mines. The Homestake group includes 18 patented and 2 unpatented claims along the crest and northeast slope of Henderson Mountain. Doc Tanzer's mining engineers and geologists expected to tap into the rich gold-copper veins exposed in the Homestake Mine. In anticipation of the strike and the completion of the

smelter in 1923, the company began construction of an aerial tram (24PA879) that connected the Homestake Mine with the Gold Dust Mine and the smelter, almost two miles away. At the time of connection with the aerial tram, the Homestake Mine consisted of three adits and 700 feet of workings (Fredlund, et al. 1990).

Despite the predictions of the Western Smelting and Power Company planners, the ore body present in the Homestake Mine was never struck by the Gold Dust miners. Both mines ceased operations by 1930. In 1948, the Parkmont Mining Company of Cooke City began a small open-cut mine on the Homestake Claim and was recovering 70 tons of $11 ore daily by 1949. Parkmont worked the open-cut with a Koehring diesel shovel and a Sullivan wagon drill. By 1950, the underground workings were inaccessible (Livingston Enterprise, 1916; Lovering 1929; Reed 1950; Fredlund 1992).

Geology and Ore Processing

The deposit being exploited at the Homestake Mine is of the contact metamorphic type. A xenolith of Gros Ventre limestone enclosed and partly invaded by monzonite porphry has been highly altered and mineralized along a complex fracture network. A series of irregular, flat-lying ore bodies contained in the xenolith was undergoing development in 1948. The predominant ore minerals are chalcopyrite and auriferous pyrite with oxides of copper, iron, and manganese. The limestone gangue is silicified and highly altered (Reed 1950).

The Parkmont operation's mill plant [located off site] was of the combined gravity-flotation type. Free gold was recovered by amalgamation of jig concentrators. The plant was powered by a 260-horsepower General Motors diesel driving a 225-kv generator. At the time of [the 1950] inspection the mill had just been completed; consequently, no reliable data regarding operation or recoveries was available. To avoid seasonal interruption of the milling operation, stockpiling of ore during the brief mining season was planned (Reed 1950).

Production prior to 1890 amounted to 420 tons of ore valued at $23,000, but this figure may include production from the Daisy claims as well. Although a considerable amount of development work was completed from 1916-1925, no ore was produced and the WS&P promotion collapsed. The property remained idle up to 1947, when open cut operations were started by the Parkmont organization. That operation treated about 70 tons of $11 ore daily (Reed 1950).

As discussed in Chapter 1, the developers of the Homestake Mine were following leads in vain. Even the WS&P and Parkmont engineers lacked sufficient geologic information. The elusive ore in the Homestake Breccia Pipe proved to be significantly lower than the leads high on Henderson Mountain suggested. Crown Butte Mines 1990s exploration found the "mother lode" ore body several hundred feet below the Homestake Adits.

Figure 3-7. Feature 2, ore bin, load-out and pilothouse, looking southeast.

This structure handled ore from an adit that is now covered with waste rock from the open cut mining activity. Ore from this bin may have been hand carted to the tram loading terminal, or it may have been loaded on trucks from this hopper. The modification of the site during the late 1940s has left this transfer mechanism in doubt.

Figure 3-8. Feature 3, upper tram loading terminal, viewing north. Ore bin to right, operator's room in center, bull wheel structure to left. The collapsed loading deck is seen leaning against the ore bin.

Figure 3-9. Feature 3, upper tram loading terminal, viewing north. Ore bin to left, operator's room in center.

Figure 3-10. Feature 3, upper tram loading terminal, viewing east. Operator's room in center. Portion of Feature 4, trestle in upper right foreground.

Figure 3-11. Feature 3, upper tram loading terminal, viewing northeast. Bull wheel support structure.

Figure 3-12. Feature 4, trestle from main adit. It appears discontiguous from the tram loading facility; its functional relationship is unknown. It may predate the terminal.

Figure 3-13. Overview of site looking east.

Figure 3-14. Overview of Homestake mine site looking north. The Gold Dust complex can be seen at the bottom of the valley.

Figure 3-15. Homestake Mine, looking south-southeast.