CHAPTER 2. THE GOLD DUST MINE (24PA874)

-- Dutch, Bill & myself left camp early, followed up Soda Butte Creek. Good trail, wide bottom, high cement mountains on both sides, which raise several thousand feet high, & thousands of little streams come rippling down the sides and from the tops of the mountains. Camped in the diggings. Snow several feet deep. Rain and snow all night, no tent.

-A.B. Henderson, June 1, 1871

from:

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

Location

The Gold Dust Mine is located on the southwest side of Fisher Creek, at the foot of Henderson Mountain. This site is in the Gallatin National Forest about three miles northeast of Cooke City at an elevation of about 9,220 feet above sea level. Figure 1-1 shows the location of the Gold Dust Mine on the USDA Gallatin National Forest map and the USGS 7.5-minute map *Cooke City Montana-Wyoming*(1986).

History

The Gold Dust Mine was the focus of Western Smelting and Power Company's operations from 1920 to 1929. Organized in 1904 as the Precious Metals Company by Dr. Gottwerth L. "Doc" Tanzer, the company was also known as the "New World Mining, Milling and Producing Company" before being renamed the "Western Smelting and Power Company" in 1912. Beginning in 1906, Tanzer launched an extensive campaign in the Eastern U.S. and in Europe to attract investment capital to what he believed was an exceptionally mineral-rich area in the northern Rocky Mountains. By 1915, Tanzer had acquired enough capital to construct a 250-kilowatt hydroelectric plant (24PA974) on the Clark's Fork River four miles east of Cooke City. The power plant was constructed to provide 3,000 horsepower to a planned copper and gold smelter and the Gold Dust and Homestake mines (24PA875). Construction on the smelter on Fisher Creek began in 1916 and was completed in 1921. Development work began on the Gold Dust Mine in 1920 and it quickly became the center of the company's efforts throughout the 1920s. By expanding the Gold Dust Tunnel to 1,000 ft, Western Smelting and Power Company mining engineers expected to tap into the rich gold-copper ore body struck by the Homestake Mine, located 700 ft above the Gold Dust on Henderson Mountain (Fredlund, et al.1990).

After completion of the smelter and with over 1,100 feet of tunnel driven into the mountain, the company began construction on an aerial tram system (24PA879) in 1923 to connect the Homestake and Gold Dust Mines with the smelter, almost two miles away. The tram was completed in 1925. The Gold Dust Mine was provided with electric lights, an electrically-driven air compressor, (the Sullivan compressor is still intact in the compressor building), air drills, ore bins, a blacksmith shop, a boarding house and several cabins. The ore was removed from the mine by mule-drawn cars. "Doc" Tanzer supervised the mining operations, which occurred during the summer months throughout the 1920s. In 1925, the Gold Dust Mine became known as the "Adit." Although the tunnel had reached a length of 2,100 feet and was connected to the Homestake by a series of raises, the company failed to strike the expected ore body and, consequently, did not stockpile or process any ore at the smelter. By 1929, the Adit had struck only isolated pockets of wire gold and little recoverable copper. By 1930, Tanzer ended his association with the Western Smelting and Power Company and the firm was forced to sell its interests to a number of small mining companies including the Yellowstone & Western Mining Company (Livingston Enterprise 1916, 1920d; Lovering 1929; WPA 1940).

Physical Remains at the Gold Dust Mine.

Sixteen elements or features of the mining operation are visible at the site. Figure 2-1 is a map of the Gold Dust Mine site and the approximate location of its features. As of 2001, most of these are in advanced stages of deterioration. The identification of the features is as follows. Feature 1 is the main adit. Feature 2 is the waste rock dump for the adit. Feature 3 is a compressor house. Feature 4 was a blacksmith shop. Feature 5 was the discharge terminal for the upper (Homestake) segment of the tram system, housed a small crusher and also transferred ore to the ore bin, Feature 6. Feature 6 is an ore bin and loading terminal for the lower segment of the tramway. Feature 7 was a boarding house. Features 8 through 11 were cabins and foundations (Feature 8-11). Feature 12 is a collapsed wood frame structure having a gable roof. Feature 13a is the collapsed remains of a large wood-frame building. A large rubble stone and mortar chimney still stands at the southeast corner of the feature. Feature 13b is a shed roof addition to Feature 13a. Feature 14 is a wood foundation located 42 feet north of Feature 13. Feature 15 consists of 13 concrete footings that cover a 42 x 32 feet area near Feature 14. Feature 16 is a metal pipeline and ditch. All of these features are believed to be associated with the operation of the Gold Dust Mine between 1920 and 1929.

Feature 1, the Gold Dust Adit, is 8.2 feet in diameter at the portal. Two sets of ore car tracks extend 60 feet north and 30 feet northeast from adit portal to the waste rock dump (Feature 2). The adit was driven between 1920 and 1925 and drifts to the southwest for about 2,300 feet. No production is recorded from the adit. Mules were reportedly used to draw the muck (waste rock) out of the adit. Figure 2-2 is a photograph of the adit as it appeared in 2001. A cable associated with the upper portion of the aerial tramway system is located 32 feet west of the adit. During Crown Butte Mining's exploration work in the 1990s, the partially collapsed portal was cleaned up and a shed was re-constructed around the entrance (Fredlund, et al.1990; Fredlund 1992).

Feature 2 is the adit's waste rock dump, measuring about 92 feet in diameter by about 60 feet at the length of toe. The waste rock dump contains approximately 5,700 cubic yards of material (Kirk 2002).

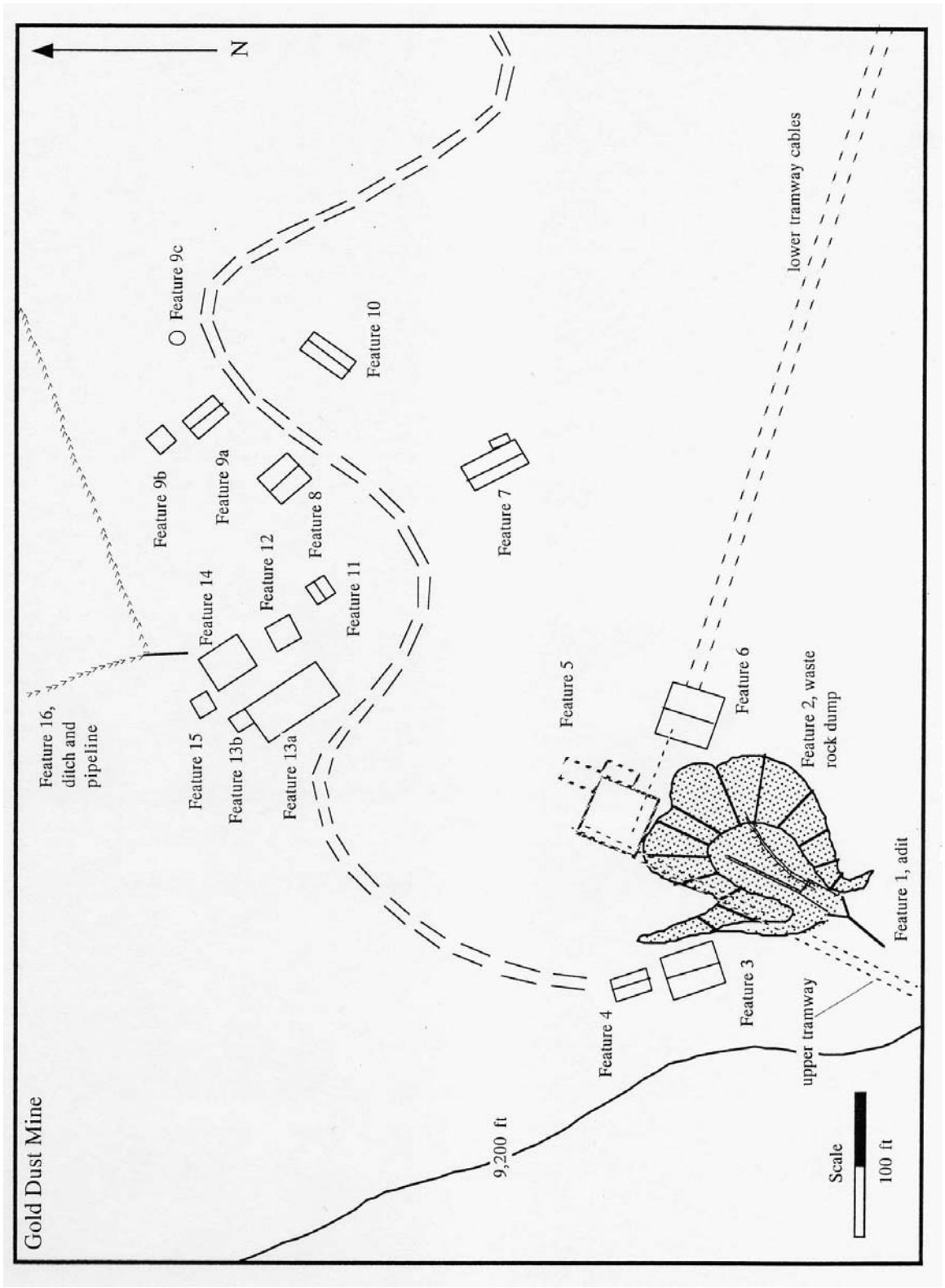

Figure 2-1. Site map of the Gold Dust Mine complex.

Figure 2-2. Feature 1, Gold Dust Adit, (after rehabilitation in the 1990s).

Feature 3 is a wood frame compressor house that has a steeply pitched gable roof. This structure was intact in 1990, but had mostly collapsed in the spring of 2001. Figures 2-3 and 2-4 are photographs of the compressor house as it appeared in 1990, while Figure 2-5 shows the structure as it looked in 2001. The following description was made in 1990:

> The facade faces northeast and is oriented northwest and southeast. The building is sheathed in novelty siding and has corrugated tin over a board roof. Exposed rafters and brackets support the overhanging eaves. The gable ends have vertical board and batten siding. There is also vertical board and batten siding above the facade windows and primary entry on the facade. The interior has diagonal board siding. The entry is central to the facade and is reached by wood steps. The entry is located on the northeast corner of the southeast wall and is also reached by wood steps. The windows have lintels, sills and posts. The 40 x 30 foot structure is supported by a wood foundation. Electrical connectors are intact on the southeast gable-end (Fredlund, et al.1990).

The Sullivan compressor (Figure 2-6) is intact in the building. It is an electrically powered compressor as indicated by the large flywheel and type of foundation and mounting (Hoffman 2002). A riveted iron air tank is also located adjacent to the building.

Figures 2-3. Photograph of the compressor house (1990 GCM file photo).

Figure 2-4. Photograph of the compressor house (1990 GCM file photo). Note tram cables and compressor tank.

Figure 2-5. Feature 3, Compressor house, as it collapsed in the spring of 2001.

Figure 2-6. The Sullivan compressor is still intact in the compressor building (Feature 3).

Feature 4 is a collapsed wood frame structure measuring 16.4 x 19.6 feet. It has a heavy wood post and beam foundation. Other construction debris includes boards and corrugated metal. This structure is visible in Figure 2-3, behind the compressor house. The structure is oriented southeast and northwest. It appears to be the blacksmith shop. A blacksmith shop was an essential component of all hardrock mines. A smith earned a higher salary than a miner (in the 1920s this was about $5.50 per day, verses $5.00 per day for a miner). By comparison, a cowboy or homesteader during this period might earn about $30-40 per *month*). The blacksmith's primary job was to sharpen drill tool steel. In a relatively modern (that is air-powered) and well-capitalized operation like this, the mine probably had a week's worth of tool steel prepared at any time. A smaller operation would not be able to afford a full-time blacksmith or spare tool steel, so a daily ritual of tool sharpening consumed several hours at the beginning of each day (Hoffman 2002).

Feature 5 is an ore discharge terminal for the upper aerial tramway bringing ore from the Homestake Mine (Figure 2-7). It was completely collapsed in 1990, and has burned since then. Here, ore from the Homestake was unloaded from the tram cars and run through an Allis Chalmers gyratory crusher (Figure 2-8), probably so it would blend or load better in the ore bin. The mechanism of ore transfer from this discharge terminal to Feature 6, the ore bin and lower tram loading terminal, is unknown. This 72 x 40 foot structure had log and wood beam construction with a wood foundation, corrugated tin roof and board siding. Tram cables from the Homestake Mine lead to the building.

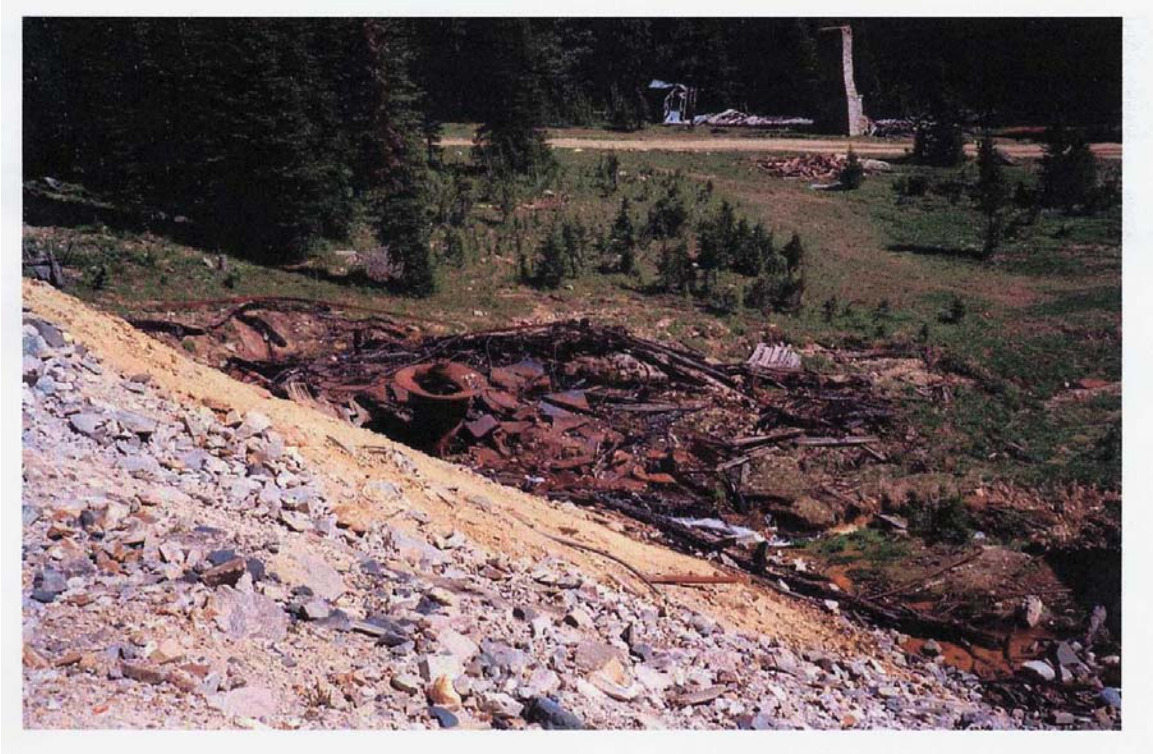

Figure 2-7. Collapsed discharge terminal for the aerial tramway from the Homestake Mine. The Gyratory Crusher is visible in the debris. The long pieces of metal are tram cable guides. The chimney at Feature 13a is seen in the background.

Figure 2-8. Allis Chalmers gyratory crusher at the load-out terminal of the Homestake to Gold Dust Tramway (Feature 5).

Feature 6 is a wood frame ore bin and loading terminal for the lower tram (Figures 2-9 and 2-10). The 36 x 34 foot structure is oriented northwest and southeast. It is located 42 feet east of Feature 5, at the base of the waste rock dump. It has a log foundation with wood frame superstructure. The gable roof is sheathed in corrugated metal and is sided with boards. There is a wood ore chute on the south side. The remains of a small shed-roof structure that had vertical and horizontal board and batten siding are located on the southwest corner. Wood on the ore bin appears to be tongue and groove. The storage bin gable-ends are constructed from vertical board and batten with vents. Metal struts add support to the wood trusses. Vertical board and batten siding is bolted to the foundation on the north wall. The tram cables for the lower tram enter on the east side of the structure. Here the tram cars passed beneath the ore chute for loading. It is not clear how

Homestake ore was transferred from the discharge terminal (Feature 5) to this ore bin. This was accomplished with a conveyor, through a small doorway on the upper west story. Rollers to support the conveyor are visible in the upper west window. As with all mining operations, gravity is the main source of energy for moving ore, and the method of transfer is usually apparent by the relative elevation of the facilities. In this case, the trestle may not have been completed, or may have totally deteriorated. The lower tram sheave wheels, guides and a bucket were still intact in the structure in 1990. The structure is now leaning noticeably as of 2001.

Figure 2-9. Feature 6, ore bin and loading terminal for the lower tramway segment (2001 photo). The remains of Feature 5, the discharge terminal for the upper tram, are in the foreground (note tram cables and cable guides amid the debris).

Figure 2-10. Feature 6, Gold Dust ore bin and loading terminal for the lower tramway segment (GCM 1990 file photo). This is the east side of the structure showing the Lawson style terminal where empty cars arrived upside-down on the bottom stationary cable-track, invert and are loaded, then proceed down the line to the smelter.

Feature 7 is a demolished wood structure located 180 feet north of Feature 5. It is oriented northeast and southwest. The feature was about 32 x 24 feet and was wood frame with novelty siding. The L-shaped structure also had a corrugated metal over board roof. Entry ways are located on the north and south walls. The structure also had a wood foundation. It is speculated that this was a boarding house (Fredlund et al. 1990).

Feature 8 is a wood-frame 13 x 19 foot craftsman-style residence, oriented northeast and southwest, with the facade facing southeast (Figure 2-11). The gable roof is sheathed in corrugated metal. The entry is central to the facade. The siding has been stripped off the facade, while the walls and rear facade have portions of original vertical board and batten siding intact. Windows are located on the north and south walls. The remains of a 6.5 x 19 foot shed addition are attached to the south side.

Feature 9a is structural remains measuring 23 x 19 feet and oriented northeast and southwest with facade on the southeast. The structure appears to have been similar to Feature 8. The structure had a gable roof with corrugated metal sheathing and vertical board and batten siding. The windows are fixed 6-light located on the south wall. The structure also had a wood foundation. Feature 9b is a wood framed, shed-roof chicken coop oriented northeast and southwest with the facade facing southeast. The 6.5 x 6.5

foot building has a wood beam foundation with screened-in openings on all walls. The coop is located 22 feet southwest of Feature 9a. Feature 9c is a collapsed 4 x 4 foot, wood-frame privy located 40 feet north of Feature 9a.

Figure 2-11. Feature 8. One of the few standing structures remaining at the site, this cabin shows pronounced effects of snow loading and deterioration.

Feature 10 is a wood framed, three-room structure that measures about 16 x 26 feet with the facade facing southeast (Figure 2-12). The roof is missing and the north wall is collapsed with other walls buckling. The structure has a wood foundation and vertical board and batten siding. The roof probably collapsed into the interior, since there is considerable debris. The building appears to have had a corrugated metal roof. Windows are located on the south and west walls. The entry is central to the facade and is flanked by two windows. Debris indicates that there may have once been a wood-decked porch on the facade.

Feature 11 is a collapsed structure measuring 17 x 13 feet, oriented southeast to northwest. The facade was on the southeast and the roof was covered with corrugated sheathing.

Feature 12 is a collapsed 19.6 x 13 feet wood frame structure which is oriented northeast and southwest with the facade on the southeast. Debris indicates that the structure once had a gable roof.


Figure 2-12. Feature 10 remains.

Feature 13a was described in 1990 as "a 32.8 x 65 foot wood-frame building with a wood foundation set on concrete footings and a gabled-roof with corrugated metal sheathing" (Fredlund et al. 1990). It has since collapsed and a good deal of the construction material has been removed. It is located 19 feet south of Feature 12 and is oriented northwest and southeast. An impressive rubble stone and mortar chimney located at the southwest side of the feature is the only standing portion of the structure (Figures 2-13, 2-14). The function of this large structure has not been identified. It may have been the mine superintendent's residence and office, or had an industrial use, but definitive interpretation is difficult due to the absence of artifacts and materials. Its concrete footing suggest greater permanence and sturdiness of design when compared to the typical residence structures at the site. Feature 13b is a (collapsed) shed roof addition to Feature 13a. It is 7 x 10 feet and is of wood frame construction. It had an addition attached to the northwest wall and had a corrugated metal roof. The walls had vertical board and batten siding. The entry is left of center on the facade (southeast) with a window on the rear facade (northwest).

Feature 14 is a wood foundation located 42 feet north of Feature 13. The foundation is about 30 x 34 feet and appears to be the remains of a wood frame building. Concrete footings are located at the corners.

Feature 15 consists of 13 concrete piers, some with metal footings that cover a 42 x 32 feet area and are in association with Feature 14.

Feature 16 is a pipeline and ditch. These appear to be part of a drainage system perhaps to divert surface water coming through the camp.

Figure 2-13. Large rubblestone and mortar chimney at Feature 13a.

Summary

Western Smelting and Power Company's Gold Dust Mine was a relatively well-financed operation compared to other undertakings in the new World District. Construction began in 1920 and activities ceased in 1929, when Doc Tanzer abruptly left the state. Under typical conditions, using air-powered "bumblebee" drills, a hardrock adit could be advance about 5 feet every two days (Hoffman 2002). By 1926 the Gold Dust Adit was 2,300 feet long and had reached the Homestake Mine's workings, located 700 feet (400 vertical feet) above the Gold Dust, by a series of raises. Hampered by failure to locate the anticipated ore reserve (projected by Tanzer's engineers to be found at about 1000 feet) and having experienced other setbacks, including a compressor explosion, no ore was apparently ever produced (Livingston Enterprise 1920c; Fredlund et al 1990).

Figure 2-14. The rubble and mortar chimney at Feature 13a, looking north. Note tram cable spool in foreground.

After discovery of the Homestake Breccia Pipe in 1990 by surface drilling, Crown Butte Mine executed an underground drilling program from the Gold Dust Adit to delineate mineralization in the lower portion of the pipe by drilling angle holes from four drill stations. The portal and underground workings were rehabilitated to gain access to the drill stations. The mine was mapped geologically during the rehabilitation work. Approximately 34,000 feet of drilling was conducted to formulate this map. The elusive ore body, estimated at about $1.8 billion in 1991, proved to be located at the same level as the Gold Dust Adit, which had been stopped about 250 feet short of the prize. The portal was closed with a series of timber sets and a locking steel gate in 1991 (Noranda 1991; Kirk 2002).