

PARK UTAH MINING COMPANY: KEETLEY MINE COMPLEX
Keetley Mine Complex
Heber City Vicinity
Wasatch County
Utah

HAER NO. UT-47

HAER
UTAH,
26-HEBLIN,
3-

PHOTOGRAPHS
REDUCED COPIES OF MEASURED DRAWINGS
WRITTEN HISTORICAL DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20013-7127

HAER
UTAH
26-HEBCIN
3-

HISTORIC AMERICAN ENGINEERING RECORD

PARK UTAH MINING COMPANY: KEETLEY MINE COMPLEX
HAER UT-47

Location: 1 mile east of U.S. Route 40 at the town of Keetley

Quad: Park City East

UTM: A) 12.462750.4997375 C) 12.463050.4497325
B) 12.462775.4497300 D) 12.463025.4497425

Date of Construction: 1923-1924

Present Owner: United Park City Mining Company,
Salt Lake City, Utah

Original Owner: Park Utah Mining Company

Present Use: The Keetley Mine is now (1987) inactive. It is being maintained in the event that future lead and zinc prices will allow it to be reopened as an economically productive facility.

Significance: The Keetley Mine is a good example of a 20th century mine complex built in the vicinity of Park City, Utah. It developed around a shaft originally built as a drain tunnel for the Ontario Mine in Park City in the 1890's.

Historian: Donald C. Jackson (1987)

The Keetley Mine is a small complex associated with the silver, lead and zinc mining operations of Utah's Park City District. It was never a very large mine and it never contained any smelting or refining equipment. It served only as a connection point between ore cars trammed out of the mine and large railroad cars that would carry the ore to smelters in other parts of Utah via the Union Pacific Railroad. However, it survives today as a well preserved example of a mining plant constructed in the state during the 1920's. To best appreciate the significance of the Keetley Mine it is necessary to briefly describe the early history of mining in Utah and, most specifically, in Park City.

In the 1830s and 1840s the Pacific Coast region was seen by travelers on the Oregon Trail as a place to develop agriculture and family farms. But with the discovery of gold in California in 1848 the region took on new meaning in America's collective psyche. The lure of quick and easy mineral wealth brought tens of thousands of "forty-niners" to California by the early 1850s and completely transformed the nature of Western migration. Remote mountain locations that otherwise would have remained unexplored for years suddenly became the focus of feverish prospecting and mining development. California was the center of this activity, but soon veterans of the California gold rush were exploring other parts of the West in search of the next "big strike."¹

Utah Territory was among the last areas in the West to yield its

mineral wealth. The reasons for this are twofold. First, in terms of transportation Utah was relatively inaccessible and there was no easy way to ship gold, silver, or other valuable minerals to Eastern markets. Second, under Brigham Young's leadership the Mormon Church actively discouraged its members from engaging in mining work. Young did not view mining, with its often illusory promise of easy riches, as spiritually suitable to his vision of how the Mormon church should build itself up in the temporal world.

Although a few Mormons participated in the initial California gold rush, such activity was a definite exception to later church policy. In the late 1860s the coming of the transcontinental railroad to Utah removed logistical problems related to transportation and the question of Mormon involvement in the mining industry took on considerable significance within the church hierarchy.

William Godbe, a relatively worldly member of the faith with previous experience in the business world, advocated that Mormons take advantage of Utah's mineral resources and develop mining in the territory before other non-Mormon "gentiles" filled in the void. However, Brigham Young was unswayed by such arguments and the church soon excommunicated Godbe for heresy.² In 1869, (at the same time as the transcontinental railroad completion) the U.S. Treasury Department noted that "little can be said of the mining operations [in Utah]," largely because Mormon leaders "discouraged their own people from engaging in it because they

thought agriculture would be far more profitable."³

In discussions with Rossiter Raymond, U.S. Commissioner of Mining Statistics, Young remarked in 1869 "What we [Mormons] used to call lead and dig and melt up into bullets, these fellow call silver now. But if anybody is foolish enough to come and mine for it, he may do so, and welcome!"⁴ Although Young did direct his comments toward any specific location, it is likely that his reference to lead and silver concerned mining activity then getting underway in an area later known as Park City.

Located approximately 35 miles east of Salt Lake City in the Wasatch Mountains, the Park City District was on the verge of becoming a major center for the region's mining industry.

Although not the only mining district in the territory that was attracting the interest of non-Mormons, it was definitely among the more important.⁵

Mining in the Park City District began in the late 1860s when prospectors working the "diggings" along Little Cottonwood Creek east of Salt Lake City expanded their range of operations into the higher reaches of the Wasatch Mountains.⁶ At a site near the broad flat valley known as Parley's Park in the headwaters of the Weber River, in late 1868 three soldiers from Fort Douglas began to explore the ridge line that separates the Provo River and Weber River watersheds. After discovering some promising looking quartz outcroppings they soon returned to their quarters. Although this discovery did not lead immediately to any bonanza strikes, it precipitated formal organization of the

Uintah Mining District (a predecessor of the later Park City District) in order to facilitate the legal location of claims by prospectors.

Scores of claims were made in the district during the next few years and by July 1870 ore was being shipped out for processing in smelters located elsewhere. However, it was not until 1872 that the discovery of the "Ontario ledge" brought the district to national attention. At that time four prospectors, (Herman Buden, James H. Kane, Rector Steen and Augustus McDowell) with mining experience in other parts of the West discovered a rock outcropping that, after a few blows with a pick, exhibited "the appearance of a chloride of silver."⁷ After filing a claim for the site and building a short mine shaft above the vein, the four partners sold their property to Robert Chambers and George Hearst for \$27,000.

The latter men were experienced miners who, after ascertaining that silver ore from the Ontario claim would provide from 100 to 400 ounces per ton, considered the claim to comprise a worthwhile investment. Their judgement proved correct and the Ontario Mine subsequently became the major focus of mining activity in the area. Its success also spawned the establishment of Park City as a residential community for miners, their families and anyone else interested the opportunities afforded by a boomtown mining center.

The Ontario Mine quickly proved profitable; by 1876 it had

already yielded one million dollars in profits.⁸ The mine's shaft steadily descended in pursuit of the rich view of ore and within a few years reached 500 feet below ground. In 1878 the company began construction of a second shaft to the 900 foot level and by 1881 work was begun on a third shaft that extended down to the 3000 foot level.

As the company's shafts descended to ever lower levels, problems with underground water increased. This subsurface flow seriously interfered with mining work and necessitated the erection of numerous pumps to drain the shafts by carrying the water to the surface. At the No. 3 shaft, a 486-ton Cornish pumping engine was built with a capacity of lifting over 3.5 millions of gallons of water a day out of the mine. In the short term this helped alleviate the problem. However, large amounts of coal were required to power the pumping engine and this seriously reduced the mine's profitability. In addition, as the mine descended further into the Wasatch Mountains pumping costs continued to rise.

In 1888 the company decided on a new approach to cope with their persistent water problem. At that time they began construction of a drain tunnel that would remove water by gravity rather than by expensive pumping. Their plan involved drilling a tunnel eastward under the mountains that separated Park City from the Provo River watershed. This tunnel was to be over 15,000 feet long with a height of 7.5 feet and a width of approximately five feet. It was joined to the Ontario mine at the 1500-foot level;

water in the deeper parts of the mine was to be pumped to the 1500 foot level and then emptied into the drain tunnel. In essence, the tunnel eliminated the need of pumping water a total of 1500 feet to the surface at Park City.

Under the supervision and authority of John B. Keetley, construction of the tunnel took six years. During most of this time drilling only took place on the tunnel face located within the Ontario mine at the 1500-foot level. However, in 1893 work began westward from the site of the tunnel mouth and, with the addition of this second "working face," construction concluded by late 1894. The tunnel cost \$400,000 but its completion allowed the company to cease operation of the expensive Cornish pumping engine.

The Ontario Drain Tunnel immediately began delivering approximately 20 cubic feet of water per second into what soon became known as Drain Tunnel Creek.⁹ Shortly afterwards, the drain tunnel was extended to provide drainage for the Daly-West Mine located southwest of the Ontario Mine. With these developments, the operations of the Park City mines began to have an economic impact on the Hailstone region beyond merely providing a market for agricultural produce.

After completion of the Ontario Drain Tunnel, a few structures were apparently built near its mouth.¹⁰ However, the tunnel was significant primarily because of the water that flowed through it. Shortly after the tunnel's completion the price of

silver in the international market dropped precipitously and by 1897 the Ontario Mine was forced to temporarily halt its operations.¹¹ By the early 20th century many mines in the Park City District were productive again but by this time silver was no longer the only important mineral being extracted in the region. Although lead had been mined in the area since the 1870s it now took on much greater economic significance. And beginning in 1905 zinc also began to be mined in economically significant quantities.¹²

Along with changes in the district's mineral production came corporate consolidations of the various mining interests in the Park City District. In 1917 the Park Utah Mining Company was incorporated, and by the early 1920s the corporate management of this firm (under the direction of President G.W. Lambourne) controlled most of the major companies in the Park City District.¹³ Under the Park Utah's management a major development took place concerning the Ontario Drain Tunnel. In the early 1920s the drain tunnel was adapted for use in hauling ore to the surface at the mine's mouth in the Jordanelle Valley. While it still carried drainage water, the tunnel was also fitted with a continuous timber structure that supported trackage for a tram/car system. Beneath this wooden frame water still flowed along the bottom of the tunnel. The rails were raised about two feet above the tunnel floor in order to keep the tram equipment from getting wet.

The use of the drain tunnel for general mine operations allowed

the Park Utah company to open up new shafts in the interior of the Wasatch Mountains. These new shafts were directed towards exploiting ore veins located considerably east of previous mining operations in the old Ontario shafts. Use of the drain tunnel (which was at the 1500-foot level below Park City) eliminated the need to vertically hoist ore out of the mine from this depth. Instead, it could be economically transported to the tunnel mouth at Keetley (so named in honor of John B. Keetley, the man who supervised construction of the original tunnel in the 1890s). Along with construction of the tram system, in the early 1920s the Park Utah Mining Company also built structures at the surface to handle the ore and waste rock hauled out of the drain tunnel.

Upon reaching the surface at Keetley, the ore was directed into a long snowshed with a tipple at the far end. Erection of the snowshed facilitated efficient operations during the long winters when snow could accumulate and drift to prodigious heights. The cars full of ore were subsequently dumped onto a conveyor and raised up about 15 feet.¹⁴ From there the ore was loaded into large railroad cars and then transported to processing facilities located elsewhere. No equipment for concentrating (or processing) the ores was erected at Keetley. Instead, the Union Pacific Railroad built a spurline from Park City to Keetley (and to the Mayflower Mine about three miles further south) solely as a means of carrying ore brought out of the newly adapted drain tunnel.

In obtaining lead and zinc ores from the Keetley Mine considerable amounts of waste rock were necessarily handled during mining operations. This waste rock could not be profitably processed because of its low mineral content. However, it had to be removed in order to provide access to richer ores. Some of this waste rock was deposited underground in abandoned sections of the mine that had been "played out."¹⁵ However, considerable quantities of waste rock were also brought to the surface and dumped onto a pile of tailings east of the mine complex.

When loaded cars exited the tunnel they were diverted into one of two lengthy snowsheds. Cars with ore rich enough for processing were directed to the north where they passed through a snowshed before reaching the loading tippie. Cars with waste rock entered into the southern snowshed and then passed directly to the tailing pile.

Prior to 1970 water from the drain tunnel flowed directly into Drain Tunnel Creek without being processed. With the passage of new environmental laws in the late 1960s treatment of this drain water became necessary. This involved the construction of a stilling pond using material taken from the waste rock pile. It also involved equipping the mine with a lime treatment facility that would constantly inject lime into the drainage water. In concert with the stilling pond, this lime precipitates out impurities and helps protect downstream water users. Historically, no health problems have been associated with the

water exiting from the old Ontario Drain Tunnel but the lime treatment and stilling basin provide insurance that this will not change.¹⁶

With the adaption of the drainage tunnel to mining operations the new Keetley Mine attracted a relatively large work force into the Hailstone region. When fully active the mine supported a work force of over 300 men to handle underground and surface operations. The work force was organized under a simple system in which the mine superintendent supervised five separate sections of employees:¹⁷

- 1) the mechanics, who maintained all mechanical equipment, machines and engines;
- 2) the assayer, who determined the quality of ore being produced at any given time;
- 3) the engineer and surveyors, who were charged with laying out future drilling and shaft work underground;
- 4) the timekeeper, who handled payroll matters; and
- 5) the foremen and shift crews who actually carried out the mining operations. The latter crews consisted of miners, timbermen, muckers, motormen, pipemen and trackmen.

To help support this influx of labor into the area the Park Utah Mining Company built a small community of nine houses to the east of the mine complex. This group of houses was made available to supervisors and shift foremen who worked for the company management. Although there are reports that a bunkhouse for mine workers was also built near the mouth of the drain tunnel, these developments did not comprise a "company town" that supported a

large portion of the work force and offered amenities such as a stores or major facilities for social functions. As of 1987 all standing structures associated with housing at the Keetley Mine have been removed or demolished.

Thinking that the new mine would attract a large number of residents into the area immediately surrounding Drain Tunnel Creek, George Fisher, owner of the large nearby ranch, subdivided a plot of land adjacent to the "Victory Highway" (modern day U.S. Route 40). Christening this new residential area as the town of Keetley, Fisher arranged for the construction of a brick schoolhouse across the street from the subdivision. Fisher subsequently built a cafe/gas station, a motel, and some frame houses on his ranch proper as part of his efforts to develop the community. However, only five bungalows were ever built on the subdivided housing tract. In addition, the schoolhouse was soon abandoned for lack of students and converted into offices for the mine. Today it is used as an apartment building.

The town of Keetley never became a residential center or a focus of community life for mine workers and it survives today as a mere shell of what Fisher originally planned for it. Because of the relative proximity of Park City, Heber City, and Kamas and the mobility offered by the automobile, it was not necessary that the work force live within a short distance of the mine.¹⁸

Keetley became an important industrial component in the local economy but apparently this did not entail a major reorientation

of regional living patterns. The mine was not an isolated development that necessitated the construction of a new, comprehensive residential/social infrastructure to support its labor force. Instead, it fit into a well populated and well developed region that was able to accomodate the facility and its work force without drastic alterations to the existing social structure.

Since opening in the early 1920s under the management of the Park Utah Mining Company, the Keetley Mine has operated under a succession of owners. The most important of these have been the Park Utah Consolidated Mines Company, the Noranda Corporation, and the United Park City Mining Company. The demand for lead and zinc has flucuated during the past 60 years and activity at the Keetley Mine has reflected these market conditions. The facility remained active through the late 1970s but in 1982 operations at the site were completely shut down and the facility "mothballed."

As of 1987 there are no immediate plans to recommence mining operations at Keetley. The surface complex is still intact but the tracks along the Union Pacific spurline have been removed. Any future activation of the mine will necessitate the construction of new facilities to transport ore for processing. As time goes on, the structures at the Keetley Mine will require continuing maintenance to keep them in operational condition. But in the short term they are still capable of use should market conditions warrant the renewal of mining operations.

- 1) For an excellent discussion of early Western mining history see Rodman W. Paul, Mining Frontiers of the Far West, 1848-1880 (Albuquerque: University of New Mexico, 1963). Paul notes that California comprised the source of practically all techniques used in later Western mining developments. See Richard H. Peterson, The Bonanza Kings: The Social Origins and Business Behavior of Western Mining Entrepreneurs, 1870-1900 (Lincoln: University of Nebraska Press, 1977), for data on the corporate nature of late 19th century Western mining activity.
- 2) See Arrington, Great Basin Kingdom, pp. 243-244, for discussion of William Godbe and the church leaderships' reaction to his call for Mormon involvement in developing the territory's mining industry. Godbe and several of his followers were placed on trail by the church and subsequently excommunicated for their, as Arrington puts it, "open criticism of church policy."
- 3) See Rossiter W. Raymond, Mines of the West: A Report to the Secretary of the Treasury (New York: J. B. Ford and Company, 1869) p. 168.
- 4) Raymond, Mines of the West, p. 168.
- 5) See Walter Crane, Gold and Silver. (New York: John Wiley and Sons, 1908) pp. 106-109 for discussion of other early mining areas in Utah. Apparently the first interest in the territory's mineral resources came from soldiers attached to the federal encampment at Fort Douglas who staked claims in the Oquirrh Mountains southwest of Salt Lake City.
- 6) A good history of 19th century mining activities and social life in Park City is provided in Dean Franklin Wright, "A History of Park City, 1869 to 1898," (Unpublished Masters Thesis, University of Utah, 1971). The early explorations of the Park City areas are described on p. 6. Unless otherwise noted data on Park City's mining history is taken from this source.
- 7) Wright, "History of Park City," p. 13.
- 8) Wright, "History of Park City," p. 91.
- 9) On contemporary U.S.G.S. maps (Quad: Park City East) there is also notice of a Ross Creek that drains the northeastern section of the small valley north of Hailstone. However, Ross

Creek is dry except for short periods during the spring and practically all water in the valley comes from the mine drainage tunnel. Hence, in this report Drain Tunnel Creek is considered the primary watercourse feeding into the Provo River at Hailstone.

10) In describing the significance of the Ontario Drain Tunnel on water supply in the Provo River watershed Mead, Irrigation Investigations in Utah, p. 100, notes that a small hydroelectric plant was built at the mouth of the tunnel. In addition, there were apparently a few other buildings located near the tunnel mouth at the turn-of-the-century. However, no trace of these structures remain as they were apparently completely obliterated by construction of the mining complex in the 1920s.

11) For data on the effect of lower silver prices on mining in the Park City district see B.S. Butler, G.F. Laughlin, V.C. Heikes and Others, The Ore Deposits of Utah (Washington, D.C.: Government Printing Office, 1920) p. 287.

12) The relative value of silver, lead and zinc production in the Park City district between 1870 and 1917 is given in Butler et al, Ore Deposits of Utah, pp. 292-293.

13) Data on the interlocking corporations controlling the Park City mining district is given in Walter Harvey Week, The Mines Handbook, (Tuckahoe, N.Y.: The Mines Handbook Co., 1925) pp. 1734, 1739, 1741. Included are entries for the Park Utah Mining Co., the Ontario Silver Mining Co. and the Park City Mining and Smelting Co. George W. Lamborune is listed as president of all three of these companies.

14) The dumping apparatus and procedure used at Keetley is described in Otto K. Bohl, "The Park Utah Mine at Keetley, Utah of the Park Utah Consolidated Mines Company" (Unpublished Master's Thesis, University of Utah, 1934) pp. 53-54.

15) Placement of waste rock within abandoned sections of the mine is noted in Bohl, "The Park Utah Mine at Keetley," p. 38.

16) The quality of water obtained from mine drainage can be a serious problem and warrants the attention of public health officials. Fortunately for water users in the Provo River Valley the Ontario Drain Tunnel is remarkably free of dangerous contaminants. The lime treatment process now in place is precautionary and not the result of any earlier difficulties.

17) Data for the number of workers employed at the Keetley Mine during periods of high productivity was obtained from site superintendent Levall Widdison during an interview with the author in August, 1986. Widdison has worked at the mine for almost 30 years.

18) The mobility of miners employed at the Keetley Mine is evidenced by site superintendent Widdison who resides on the southwest side of Heber City and drives daily to mine. His commuting time is only 1/2 hour each way for the 15 mile trip. Other workers now employed by the Bureau of Reclamation on the Jordanelle Project who used to work at the Keetley Mine are long time residents of Kamas, an agriculture community about 8 miles east of Hailstone. In August, 1986, the author interviewed Levall Widdison, site superintendant at Keetley Mine and a long time employee at the mine. Widdison reported that the 9 houses adjacent to the Keetley Mine were reserved for foremen and not available for occupancy by workers lower in the mine hierarchy. No store was built as part of the small residential complex. In Mortimer, How Beautiful Upon the Mountains, p. 1115, there is a report that a commissary and some bunkhouses were built at the mine but no evidence of these facilities survives. In the early 1980s the 9 houses at the Keetley Mine proper were demolished except for one structure that was purchased by Levall Widdison. Widdison subsequently moved the house to his property in Heber City. He has since refurbished it and is renting it out to tenants.