Butte Mineyards
Steward Mine
Butte Vicinity
Silver Bow County
Montana

HAER No. MT-36-C

PHOTOGRAPHS

ADDENDUM
FOLLOWS...

Historic American Engineering Record
National Park Service
Deaprtment of the Interior
Washington, D.C. 20240

ADDENDUM TO BUTTE MINE YARDS
STEWART MINE
Intersection Main and Woolman Streets
Butte vicinity
Silver-Bow
Montana

HAER No. MT-36-C

HAER
MONT,
47-BUT.V,
1-C-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Rocky Mountain Regional Office
Department of the Interior
P.O. Box 25287
Denver, Colorado 80225

HAER MONT, 47-BUT.V, 1-C-

HISTORIC AMERICAN ENGINEERING RECORD
STEWART MINE

1. INTRODUCTION

Location:	Located within the Butte National Landmark District, Butte, Montana. The site is located approximately 200 feet north of the intersection of North Main and Woolman Streets on the east side of the street: Township 3N, Range 8W, NE1/4 of the NW1/4 of the NE1/4 of Section 13.
Quad:	Butte, Mont. - 1959
UTM:	Zone 12 - 381225 Easting 509725 Northing
Date of Construction	Late 1880s
Present Owner	Mountain Con Mining Co. P. O. Box 605 Butte, Montana 59701 Silver Bow County
Present Use:	Abandoned. Oepartment of State Lands has developed a plan for reclamation and concrete bulkheading of shaft. Hoist house is intact.
Significance:	The Stewart represents one of Butte's oldest and most productive mines. It is historically significant for its association with William A. Clark and the Anaconda Copper Mining Company. The mine's steel headframe has engineering significance because of design and date of construction and the auxiliary hoisting engine constitutes one of the last examples of a steam-powered hoist found on the Butte hill.
Historian:	Brian Shovers

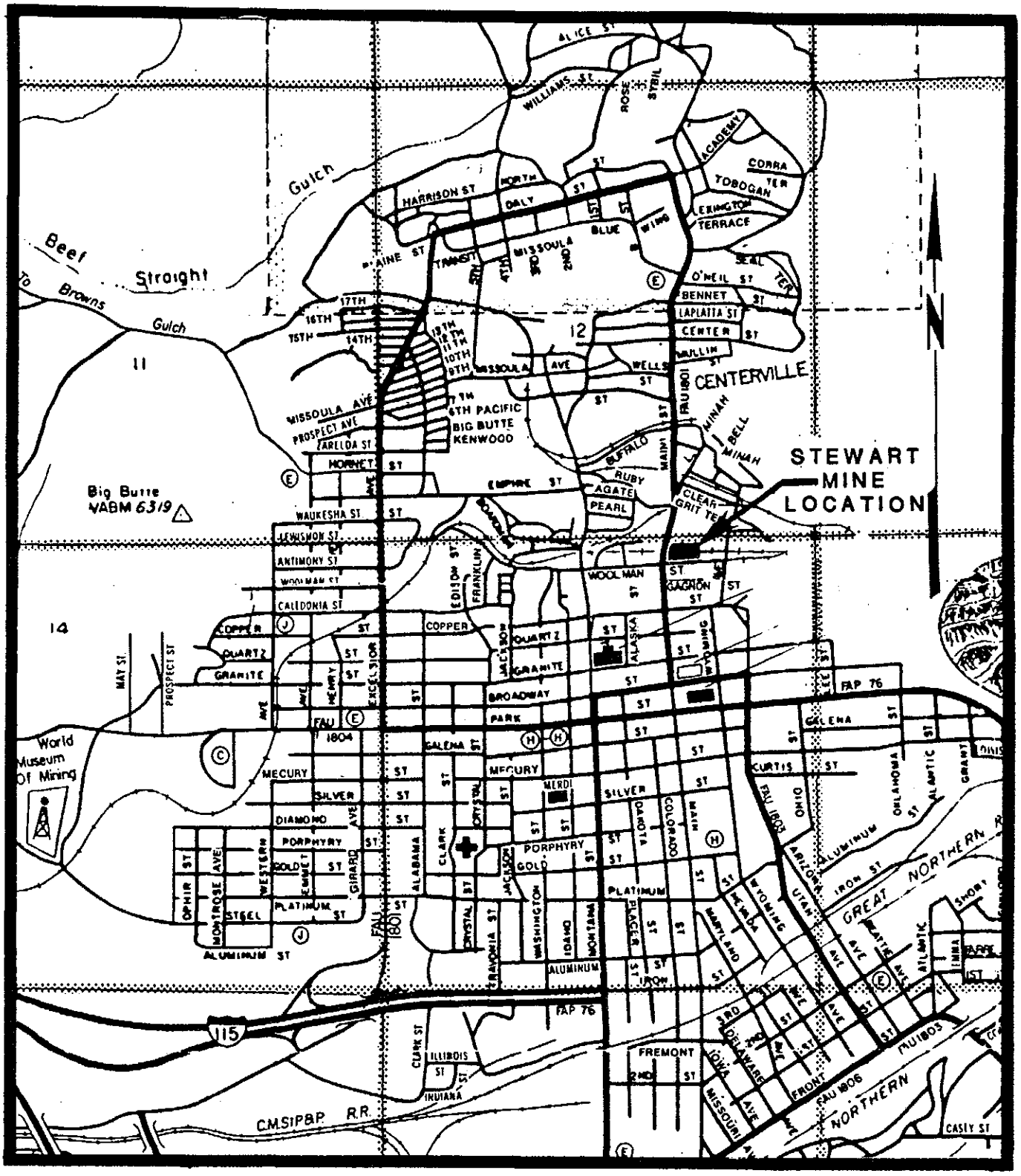

Figure 1. Location of Stewart Mine on 1970s Butte city map.

II. HISTORY OF THE STEWART MINE

A. BACKGROUND

Consolidation of the Butte Mining District

Mining in Butte began rather inauspiciously in 1864 with the discovery of gold in Silver Bow Creek just west of the present city. These early prospectors unknowingly initiated a series of events that in less than twenty years would transform a mediocre placer camp, inhabited by several hundred gold seekers, into an industrial metropolis on its way to becoming the world's foremost producer of copper.

The Silver Bow placer camp quickly faltered after the initial strike because it lacked the richness of eroded gold and the large amounts of free-flowing water which were so necessary for placer mining. Although early miners recognized the existence of silver in the ore, the difficulty of extraction and refining halted development for some time. These early miners did not have access to either the mining technology, capital or transportation system necessary to make the recovery of silver from these complex ores feasible. By 1870 only several hundred people remained in the camp.[1]

While most had given up hope for the future of the mining camp, William Farlin assayed some ore from his Asteroid claim and, finding it rich in silver and copper, relocated his claim on the last day of 1874, giving birth to a new era of mineral development in Butte. The next year, Farlin began construction of the 10-stamp Dexter mill with a loan from the bank of W. A. Clark. Other stamp mills followed, including the Lexington which was rebuilt by entrepreneur A. J. Davis to process silver ore. In 1876 Marcus Daly, an employee of the Walker Brothers of Utah, arrived in Butte and purchased the Alice lode. The Alice rapidly became a prominent Montana silver mine. By 1887, 290 stamps processed silver ore in Butte. The repeal of the Sherman Silver Purchase Act (during the Panic of 1893, a national economic crisis) ultimately led to the demise of the silver boom in Butte as well as in dozens of other mining camps throughout the West. Ironically, the perseverance of early prospectors like Farlin brought many of them little in return, while later bringing fortunes to shrewd businessmen like Clark, Daly, Davis and Frederick Augustus Heinze. Hardrock mining became profitable when

it acquired the accouterments of industry: capital and technology.[2]

The story of how money and technology transformed a "glory hole" into a booming silver industry repeated itself with the more prosaic copper. Although the first significant copper claim was staked out in 1864, most of the other major copper claims were located between 1871 and 1879. In 1876 a miner by the name of Billy Parks found a 4-ft copper vein at a depth of 150 ft, beginning a century of copper mining and ore processing at Butte. However, this discovery by Parks became significant only when the technology for development became available.[3]

The Industrialization of Butte Mining

Four factors were needed to transform the minerals beneath the Butte hill into the basis for industrial activity previously unknown in the northern Rockies. An efficient transportation system was the first necessary component since profits could not be accrued from hardrocking mining without it. Before the building of the Colorado Smelting Company in Butte in 1879, freight wagons hauled ore to the railhead at Corrine, Utah, some four hundred miles to the south. The arrival of the Utah and Northern Railroad in 1881 brought Butte closer to markets and refineries in the East and to the equipment necessary to expand Butte's mining industry. In 1883 the Northern Pacific tied Butte to the Great Lakes and Seattle and in 1893 Daly completed the Butte, Anaconda and Pacific railroad to haul ore from the Butte mines to his smelters in Anaconda.[4]

Word of promising silver and copper prospects in the Summit Valley attracted outside capital, another necessary element in any industrial enterprise, particularly hardrock mining. Frontier capitalists such as W. A. Clark, Marcus Daly, A. J. Davis, George Hearst, the Walker Brothers, and Samuel Hauser invested heavily in properties and in mining machinery including timber for headframes and shafts, steam hoists, stamp mills and furnaces to reduce the ore.[5]

The third important factor in Butte's phenomenal growth as a mining district (between 1875 and 1884) was the construction of numerous mills and

smelters for processing the Butte ore. By 1881 the Parrot Smelter turned out high-grade silver-copper matte; the Lexington mill crushed the rich silver ore from its mine; and the Montana Copper Company thrived east of Butte in Meaderville. The Butte Reduction Works, the Colusa, and the Butte and Boston followed shortly after, virtually eliminating the costly shipment of primary ores. Daly's construction of a large concentrator and non-ferrous smelter at Anaconda in 1884 insured Butte a future in the world copper market.[6]

Finally, the emerging electrical age guaranteed a growing demand for Butte's copper. American cities increasingly used electricity as a power source for lighting, communications and industrial motors. These propitious circumstances of the 1880s prepared the way for men with capital to gather together dozens of disparate mining properties into a single corporate entity of enormous influence.[7]

The Building of an Industrial Empire

From the time Michael Hickey located the monumental Anaconda claim in 1876 until the incorporation of the Anaconda Mining Company in 1891, scores of individual entrepreneurs operated the mines on the Butte hill. Marcus Daly, who was acting as mine superintendent for the financial partnership of George Hearst, James Ben Ali Haggin and Lloyd Tevis, initiated a process of consolidating mining properties and ore processing facilities. This ultimately led to the creation of America's first fully integrated copper mining company and a world-class producer of valuable metals. Daly's death in 1900 led to a decade-long battle for control of the Butte hill. In the end the major Butte mines were taken over by Standard Oil interests under the aegis of a holding company - the Amalgamated Copper Company.

In 1900 W. A. Clark controlled the Moulton Mining and Reduction Works and the Colorado Smelting and Mining Company as well as to other valuable mining properties, including the Original, the Stewart and the Gagnon. New York and Boston investors controlled the Boston and Montana, and the Boston and Boston Mining Companies. The Montana Copper Company, owned by Charles Meader

and the Lewisohn brothers, operated the Leonard, the Colusa, the Mountain View and the Badger State mines. F. Augustus Heinze created the Montana Ore Purchasing Company and operated the Rarus along with other successful properties. By 1910 Almalgamated had purchased most of these mining and smelting companies and began to integrate their operations.[8]

Amalgamated soon controlled other resources critical to mining and smelting such as coal, timber, water and hydroelectric systems. The holding company owned both the dam at Black Eagle Falls which supplied power to the Boston and Montana Smelter, and the Canyon Ferry Dam built on the Missouri in 1902 to supply power to the mines of Butte. In 1910 Amalgamated merged all of its subsidaries into the Anaconda Copper Mining Company (A.C.M.). Two years later, John Ryan, chairman of the board of A.C.M. consolidated a number of small power companies to form the Montana Power Company. The availability of inexpensive hydroelectric power enabled A.C.M., to further expand its industrial empire of mines, smelters and refineries. In 1913 Ryan used power from his fledgling company to electrify the Butte, Anaconda and Pacific Railroad, originally built by Daly to transport ore from mine to smelter.[9]

Consolidation of the Butte Mining District

A.C.M.'s phenomenal rise to prominence as a world-class copper producer would not have occurred without the company's access to large quantities of inexpensive hydroelectric power [$35/horsepower/year compared to $125 horsepower/year for steam power]. The mining operations in Butte and the smelting and refining that occurred in Anaconda and Great Falls profited greatly from John D. Ryan's business ventures in electrical power generation. With the consolidation of independent power companies under the Montana Power Company, Ryan linked together 11 power plants and constructed over 1300 miles of high voltage transmission lines. Ryan used hydroelectric facilities at Madison River Plants 1 and 2, Canyon Ferry Dam, Hauser Lake Dam, the Rainbow Falls Plant and the Black Eagle Plant

to meet the 24,000 kilowatt needs of the Butte mines and the 20,000 kilowatts of power necessary to operate A.C.M. smelters at Anaconda and Great Falls. Montana Power constructed a total of 46 substations across the state to regulate the electricity produced at company dams. This power was distributed to over 40 Montana cities for lighting, public transit, and industrial use. The enormous demand for electrical energy created by the mining and smelting industries made power available for other aspects of the Montana economy such as irrigation for agriculture, coal mines and flour mills. Hydroelectric power generation designed to power Butte mining and smelting operations prompted the early industrialization and modernization of parts of rural Montana as well.[10]

By 1910 A.C.M. decided to put electricity to work to power its ore-hauling shortline between Butte and Anaconda. In 1911 the Butte, Anaconda and Pacific (B.A.& P.) purchased the equipment necessary to transform its system of steam power to one powered by electricity. The 2400-volt direct current system manufactured by General Electric eliminated much of the costly maintenance of steam locomotives while providing faster more efficient service. The B.A.&P. high-voltage system proved unique among American electric railroads and it soon established a record of remarkable freight-hauling prowess, hauling some 13,700 tons of ore daily and over five million tons a year. By 1914 the B.A.&P. system included over 36 miles of mainline track and spurs, serving over a dozen mines on the Butte hill and the smelter at Anaconda. The B.A.&P. was part of the growing industrial empire of Montana mines, mills, smelters, timberlands, transportation and utility networks lorded over by A.C.M.[11]

Amalgamated Copper Company persisted until 1915, although after 1910 most of the Butte operations were actually associated with its subsidiary A.C.M. Between 1910 and 1927 A.C.M. successfully consolidated all of the major Butte mines with the exception of the North Butte Mining Company properties (i.e., Speculator, and Granite Mountain), the Butte and Superior mines, and the East Butte Copper Company operations. A.C.M. linked together its 22 Butte shafts through a series of underground and above ground connections.

Tunnels and drifts tied together the workings of mines at either end of the 3-mile wide district, making for more efficient hoisting, ventilation and pumping. By 1927 ore was hoisted through a dozen shafts with the most efficient hoisting engines and tallest headframes. Some historic hoisting shafts became air shafts while connections between mines increased the efficiency of the mechanical ventilation system installed by A.C.M. after 1914. A.C.M. connected all of its mines on the Butte hill on the 2800-ft level to facilitate the drainage and pumping of mine water.[12]

On the surface, A.C.M. connected its far-flung mining properties through an intricate web of powerlines, pipelines, roads and railroad tracks. Electrical power for hoisting, pumping, ventilating, lighting and tramming was distributed to the various A.C.M. mines through a 100,000 volt substation located on the Butte hill just below the High Ore Compressor Plant.

A.C.M. produced compressed air to operate hoisting engines and rock drills at three separate locations on the hill: at the Leonard, the Bell, and the largest at the High Ore, replacing smaller compressors originally sited at individual mines. The central compressor plant at the High Ore contained six 1200-horsepower synchronous electric motors. Twelve-inch steel pipes carried the compressed air to steel receiving tanks located at each mine where compressed air was stored for use in the event of a breakdown at the central plant. A single mine hoist could operate for one hour on stored air. The tanks also helped regulate the air flow with demand. A.C.M. constructed a 100-ft steel water tank with a capacity of 500,000 gallons just below the High Ore Plant to maintain a constant pressure of 90 pounds/square inch throughout the system. By 1922 the High Ore Compressor Plant served 22 A.C.M. mines, requiring a coordinated hoisting schedule to avoid demand overloads within the district-wide system.[13]

Spurs of the B.A.& P. mainline tied all the A.C.M. mines on the Butte hill to company smelting facilities in Anaconda and to the various consolidated shops on the hill. Between 1880 and 1910 each mine had their own machine shop, blacksmith shop, carpentry shop and rope repair shop. After 1910

A.C.M. consolidated a number of these functions in singular locations around the hill. Dull drill steels from A.C.M. mines were sharpened and wire rope repaired at the Diamond shop while the Leonard served as a central site for timber framing, eventually replacing the framing mill at Rocker. With the opening of the Kelley shaft in the late 1940s, A.C.M. concentrated all company blacksmithing and machine repair at a shop adjacent to the Kelley. A.C.M. also maintained small blacksmith's shops and carpenter's shops at each mine to handle immediate needs well into the twentieth century. The most significant change in Butte's landscape that occurred with consolidation by A.C.M. was the disappearance of mills and smelters as A.C.M. concentrated these elements of the process at massive facilities in Anaconda and Great Falls. The B.A.& P. constituted a lifeline for the A.C.M. mines, daily hauling ore and supplies needed for operation.[14]

Modernization of the Butte Hill

Between 1927 and 1950 A.C.M. (later re-named the Anaconda Mineral Company) streamlined mining operations in Butte through the expanded use of faster and more efficient electric hoisting; the installation of miles of flexible underground ventilation ductwork; and the use of powerful surface fans. During this period several of the major Butte mines reached a depth of 4000 ft. Some older shafts were abandoned in order to make use of the more modern hoisting facilities at other shafts. In 1947 A.C.M. began work on the much wider concrete-lined Kelley shaft as part of a major block-caving operation initiated to make removal of a lower-grade ore body possible. Once completed, the Kelley constituted the largest hoisting shaft in the United States, capable of bringing four times as much ore and men to the surface in a single trip as had previously been possible at the Badger or the Mountain Con. With the Kelley block-caving project, production levels reached 15,000 tons of ore per day which eventually led to the abandonment of less efficient hoisting operations at adjacent shafts. However, by 1955 the ore encountered through block-caving was of such a poor grade A.C.M. turned to a radically new mining method for Butte.[15]

The Berkeley Pit, started in July 1955 with the extraction of 17,000 tons of ore per day, represented the most dramatic change in mining methods seen in Butte during the district's 80 year history. The Berkeley Pit rapidly became recognized as the largest truck-operated pit mine in the nation. Behemoth ore trucks, ranging in size from 25 to 150-ton capacity, lumbered out of the pit enroute to the nearby Weed Concentrator, designed to crush and concenetrate low-grade copper ore more efficiently than its older counterpart in Anaconda. This new mining technique also produced a sub-milling grade ore in which copper could be removed using a process called dump leaching, further extending the life of the Berkeley Pit. While open-pit mining in the Berkeley dominated Anaconda activities in Butte until the early 1980s, the company explored the possibility of extensive zinc mining at the Missoula and Ryan shafts on the west edge of the district and at the Badger on the east side. The company continued to mine copper in the deep levels of the Mountain Con and the Stewart through the Kelley shaft. In 1973 Anaconda halted all underground mining, placing all hope for the future in pit mining. But the Berkeley Pit, producing 50,000 tons of ore per day at the end, could not on its own overcome shrinking world markets and foreign competition with their rich ore reserves and labor at one-tenth the cost of American labor. On June 30, 1983 ARCO, the new owner of Anaconda, suspended all mining in Butte.[16]

The demise of the century-old enterprise of hardrock mining in Butte was part of a world-wide trend in which the leading North American metal producers had succumbed to challenges from Third World producers. Until the 1970s American corporations (Kennecott, ASARCO, Phelps Dodge, AMAX, and Anaconda) dominated the world production of copper, but political, technological and geologic circumstances irretrievably reversed the U.S. position. Chile was typical of foreign producers with its largely untapped, rich ore reserves; absence of environmental regulations; latest recovery techniques; cheap labor; and access to open markets in the industrialized world. The results have been catastrophic to an American industry beseiged by costly environmental compliance and the depletion of high-grade ore reserves. Between 1981 and 1984 the number of working American metal miners

shrunk from 109,000 to 44,800 and corporate losses topped 3 billion dollars. After 1984 the price of copper rose almost fifteen cents a pound which, along with a streamlined work force and wage cuts, led to a resumption of copper mining in Butte. In 1985 Washington Construction of Missoula, Montana reconstituted the Anaconda Company under the name of Montana Resources, Inc. and reopened the East Berkeley Pit for copper and molybdenum production. In 1987 an Australian investor purchased a number of the historic Butte underground mines from Montana Resources, promising to re-explore the Butte underground for silver and to employ some innovative above-ground techniques of silver extraction. After a brief remission in mining activity the shovels were once again unearthing valuable minerals in the mineral-rich Summit Valley, even though Butte would probably never again regain the prominence it held in world mining circles during A.C.M.'s reign over the district. Even so, Butte's niche in the chronicle of hardrock mining continues to be acknowledged by those who write world mining history.[17]

B. HISTORY OF THE STEWART MINE

The Stewart Mine (referred to in early documents as the Steward) was one of Butte's deepest and most productive copper-silver mines from the late 1890s until its closure in 1973. Although large-scale development did not begin at the West Stewart until the turn of the century, the original mining claim was actually patented several decades earlier. On August 9, 1877 William A. Clark, John W. Steward, Samuel F. Larabie, and Clark's brother, Joseph, filed on 10 acres known as the Steward Lode in the Summit Valley Mining District of Deer Lodge County (Lot No. 53, Mineral Certificate No. 391, General Land Office No. 3191).[18] The Stewart vein (a maximum of 30 feet wide), rich in silver ore, branches both east and west of the original lode encompassing the Gagnon, Original and Parrot mine sites. The Clark Brothers initially developed the Steward Lode from the East Stewart shaft (inclined at 15° from vertical) beginning in the 1880s, working the vein sporadically with 10 to 30 men and reaching a depth of 330 feet by 1894. The miners worked the two compartment shaft using a 10 x 12 inch cylinder Ledgerwood steam engine for hoisting.[19]

Within the next six years the Stewart grew from a small, insignificant operation into one of Butte's premiere copper-silver mines. By 1895 W. A. Clark and his brothers, J. Ross and Joseph, operated the Original and the Colusa-Parrot, both located along the Stewart vein and very rich companions of the East Stewart. Since arriving in Butte in the 1870s the Clarks had accumulated a number of other valuable mining properties including the Black Rock, Elm Orlu, Acquisition, Black Chief and the Moulton. But even more important than his extensive mineral holdings, W. A. Clark had solved the persistent problem of extracting the copper and silver from the complex sulphide ore with the construction of a large capacity concentrator and smelter, the Butte Reduction Works, located on the southern edge of the city. As early as 1878 Clark had

collaborated with Nathaniel P. Hill; a widely known Black Hawk, Colorado smelting expert; in bringing advanced Colorado reduction techniques to Butte under the name of the Colorado Smelting & Mining Company.[20]

The miners made great advances in the Stewart shaft during the last years of the nineteenth century, reaching a depth of 600 feet in 1895, 800 feet in 1898, and 1000 feet in 1900. Part of the reason for the extraordinary advances in shaft depth can be attributed to manpower; by 1900 the number of miners working for Clark in the Stewart reached 140. Another significant factor in production during this period can be linked to technology; a more powerful 16 x 30 inch cylinder E.P. Allis hoisting engine replaced the old engine. The success of Clark's vast and varied industrial enterprises throughout western Montana permitted unthrottled development of the Stewart and adjacent Clark holdings for the next ten years.[21]

The first years of the twentieth century marked noticeable changes both above and below ground at the Stewart. By 1902 a 120-ft shaft steel headframe replaced the wooden one over the 1300-ft deep, three compartment shaft. One hundred and forty men worked underground, setting 10 x 10 inch timbers and driving connections between the Stewart and the other Clark mines; the Nipper, Parrot and Original. That same year work continued on a shaft several hundred feet to the west, a mine that came to be known as the West Stewart. Clark employed 114 men to work this mine, who in one year's time advanced the shaft 650 ft, creating a shaft 1100 ft deep. During the first few years of the twentieth century Clark purchased a 32 x 72 inch cylinder Nordberg hoist operated on compressed air for use at the West Stewart.

By 1905 the number of miners working underground had risen to 235 and the shaft reached a depth of 1900 ft. Tunnels were driven connecting the West Stewart with the Clear Grit and the Mountain Consolidated (a large Anaconda mine to the north). The trammers at the West Stewart still relied on horses to move ore from the stope to the shaft, while some of the Amalgamated mines (to become part of the Anaconda Copper Mining Company after 1910) had already shifted to electric locomotives for tramming. By this time work in the East Stewart had subsided and the shaft was relegated to serve as a ven-

tilation shaft for the more productive West Stewart. Even with improved ventilation the Stewart remained one of the two hottest mines on the Butte hill (the Belmont being the worst), with temperatures as high as 130° F. in certain deep-level stopes.[22]

On June 1, 1910, a new chapter began in the story of the Stewart Mine with the transfer of ownership from W. A. Clark to the Anaconda Copper Mining Company (A.C.M.), a world leader in copper mining and ore processing. During the last months of Clark's dominion ore hoisting was transferred from the Stewart to the Original Mine. Six months later hoisting resumed at the Stewart, and ore mined at the Little Minah and the Clear Grit was hoisted through the Stewart shaft. In 1911 the ACM found a vein of high grade ore on the 2300 ft level and set their workforce of 479 men to the task of drifting in both directions from the shaft along the vein. By 1912 miners at the Stewart reached a depth of 2500 ft using a hoisting system of three double-decked cages and 7-ton ore skips attached to 1-1/2 inch round wire rope and powered by the new Nordberg engine. The same year fire ravaged workings at the 1700 ft level but damage was confined to that single level and work continued in stopes above and below. Even with copper production falling off precipitiously in the Butte District with an end to World War I, by 1920 the shaft at the Stewart reached a depth of 3633 ft, making it the deepest ACM mine in Butte.[23]

During the next two decades low metal prices, strikes, and a nationwide economic depression temporarily halted mining at the Stewart. World War II demands for copper reactivated work at the Stewart and for the next twenty years prodigious amounts of ore were raised from the depths of the Stewart. After World War II copper continued to be hoisted from the depths of the Stewart mine through the modern, concrete-lined Kelley shaft located on the Butte hill to the northeast. In 1947 ACM sunk the Kelley shaft as part of a new "block-caving" project on the Butte hill, an ore extraction process designed to extract a lower-grade ore more economically. Miners connected the Stewart underground to the Kelley on

the 3000 ft level so that ore mined through traditional stoping methods in the Stewart could be raised through the Kelley taking advantage of its larger skips and more powerful hoisting engine. Even after A.C.M. halted block-caving in 1955 and turned to pit mining in the eastern part of the district, miners continued to extract copper ore selectively in the Stewart underground until 1973 when all Anaconda underground operations ceased. Some experimental mining actually occurred in the Stewart until 1980, some three years before all mining in Butte ceased. The Stewart shaft eventually reached a depth of 4400 ft, making it one of Butte's longest operating and deepest copper mines.[24]

When A.C.M. absorbed the Stewart mine into its corporate portfolio in 1910 it relinquished its identity with W. A. Clark and became an integral part of a much larger industrial machine, which included 21 other mines on the Butte hill, a shortline electric railroad, and a district-wide compressed air system. Physical connections linked the Stewart mine, both above and below ground, to the world's largest copper producer. The Stewart bears historical significance both for its early association with William A. Clark and its later ties to A.C.M. Clark arrived in Butte an enterprising young merchant in 1872 and by 1889 had become one of America's wealthiest men as a result of a myriad of ventures in mining, smelting, banking, railroads and electrical power generation. The Stewart constituted just one of the many holdings of Clark's vast financial empire. Throughout its 100 year life, the Stewart mine remained a highly productive underground operation, even as the orebody in other parts of the district diminished in value.[25]

III. THE MINE

DESCRIPTION

Only a small percentage of the structures once found at the West Stewart mine and none of the structures originally located at the East Stewart (700 ft east of the West Stewart) still stand today. Three significant structures remain standing at the West Stewart: the steel headframe, the main hoist house, and the auxiliary hoist house.

The headframe, which stands 126 ft tall, is constructed of riveted H-beams connected to channel sections riveted together with lacing bars. The entire structure is anchored to concrete footings. Two 10-ft diameter sheave wheels - and a smaller sheave to operate the auxiliary hoist - sit at the top of the headframe. An attached steel discharge chute is located near the top of the headframe where ore hoisted in 5-ton skips was dumped. The bottom of the chute, constructed of timbers and dimensional lumber, will be removed in order to cap the shaft under the direction of the Montana Department of State Lands as part of their reclamation plan for the site. The headframe sits over a 3-1/2 compartment shaft.

Erected between 1898 and 1902, the steel headframe at the West Stewart constitutes one of Butte's earliest examples of the larger steel headframes, permitting the use of five-ton skips. The construction of this headframe resembles the one erected by William A. Clark at the Original Mine in 1902. The Gillette-Herzog Mfg. Co. of Minneapolis, a company noted for its construction of steel bridges, manufactured both headframes. The headframe was designed so ore could be shunted directly from ore cars via a tramway into loading bins, from which rail cars could be loaded. In the later years the Anaconda Company abandoned this rail line and used trucks to haul ore to the Weed Concentrator. These early steel headframes were lighter than the Anselmo and the Mountain Con headframes. Because of the short distance between the hoisting engine and the headframe the floor of the hoist house was elevated in order to prevent undue tension on the steel rope.

The hoist house is a one-story, 50 x 50 ft building with a concrete foundation and floor, and brick-bearing walls with a steel, flat-Pratt trussed roof. The asphalt-covered gable roof has a large shed dormer off the front and a three-lite roof monitor along the ridge. There is a tower at the building rear with corrugated metal siding and a gable roof. A shed roof, covering a wood loading dock is on the east side while an asphalt-covered gable-roofed addition intersecting the main gable is on the west side. There is a bracketed gable overdoor above the main entry on the east side while double-hung windows with a 20/20 transom lights the interior. The structure was built sometime between 1891 and 1906.

In 1906 W. A. Clark replaced the steam hoist with a 36 x 76 inch, 2500 horsepower, first-motion duplex hoist powered by compressed air. Replacing steam with air became common practice on the Butte hill during the first decade of the twentieth century and this retrofit usually could be accomplished by enlarging the steam engine cylinders. With the exception of the Original Mine, the Stewart has the only remaining brick hoist house on the Butte hill, even though the brick hoist house had once been a common sight in the Butte district. The tower at the rear of the hoist house contains a steam line which powered the hoist.

The auxiliary hoist house is a one-story wood frame structure, 25 x 30 ft, with a concrete foundation and floor. Steel I-beam joists and heavy-timbered Howe trusses support the wood-planked and asphalt-covered gable roof. There is a shed dormer off the ridge and the building is sheathed with board and batten siding. The windows are double-hung 6/6 and a bracketed overdoor covers the two bay wooden doors. The structure housed a S.F. Bowser steam hoist manufactured in Fort Wayne, Indiana. The Bowser steam hoist located at the Stewart was converted to operate on compressed air early in the twentieth century. The steel tank and smokestake located adjacent to the auxiliary hoist house on the west served as an exhaust for the steam-powered hoisting engine. Clark erected the building sometime between 1891 and 1906.

To the west of the main hoist house, concrete foundations of several structures integral to the mining process are located. Immediately adjacent to the hoist house stood four steel compressed air receiving and storage tanks, which were sold by Montana Resources, Inc., sometime after they purchased the Anaconda Company in 1985. Just to the west of these structures stood the framing shop, where mine timbers were cut to the exact dimension needed in the underground workings. The timber bins, where milled timbers from the timber framing mill in Rocker were stored for delivery underground, were also located in this area. The compressor line that originated at the central compressor at the High Ore - in recent times the Cora - enters the Stewart yard on the east and exits on the west on route to the Anselmo. The compressor line can still be seen at the northwest corner of the hoist house. The Stewart crew used compressed air to power the hoist and drilling equipment.

A number of significant structures that were an integral part of the Stewart mine operation during the early twentieth century have been removed from the site. The tool shop, a long timbered ore bin, a carpenter shop, machine shop and blacksmith shop, an ice house, a building for storing hay and candles, and a change house have all disappeared. As operations became consolidated on the Butte hill by A.C.M. and with the increased use of the Kelley shaft for hoisting from the Stewart workings after about 1955, many of these structures lost their usefulness and were removed.

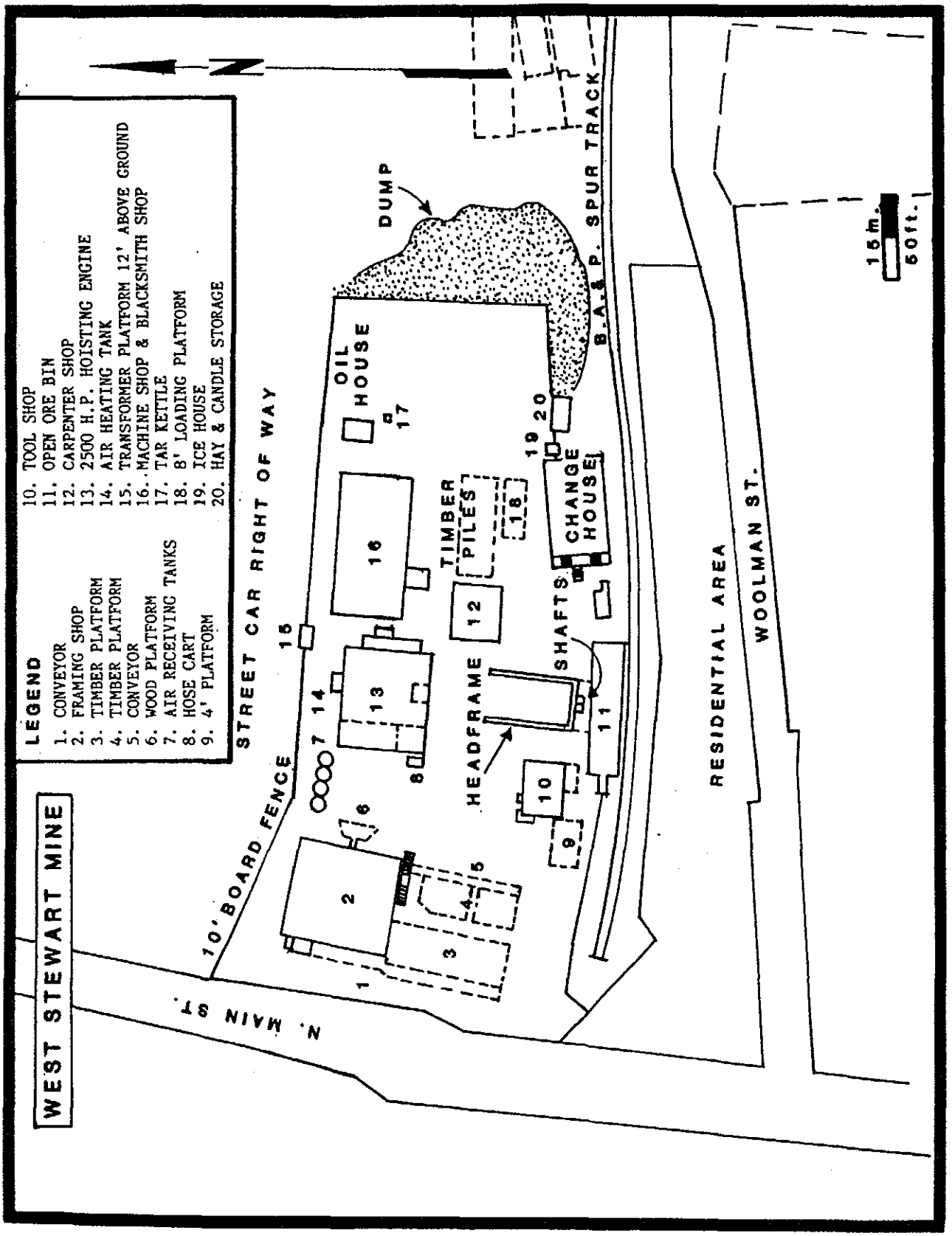

Figure 2. 1914 Sanborn Map of Stewart Mine.

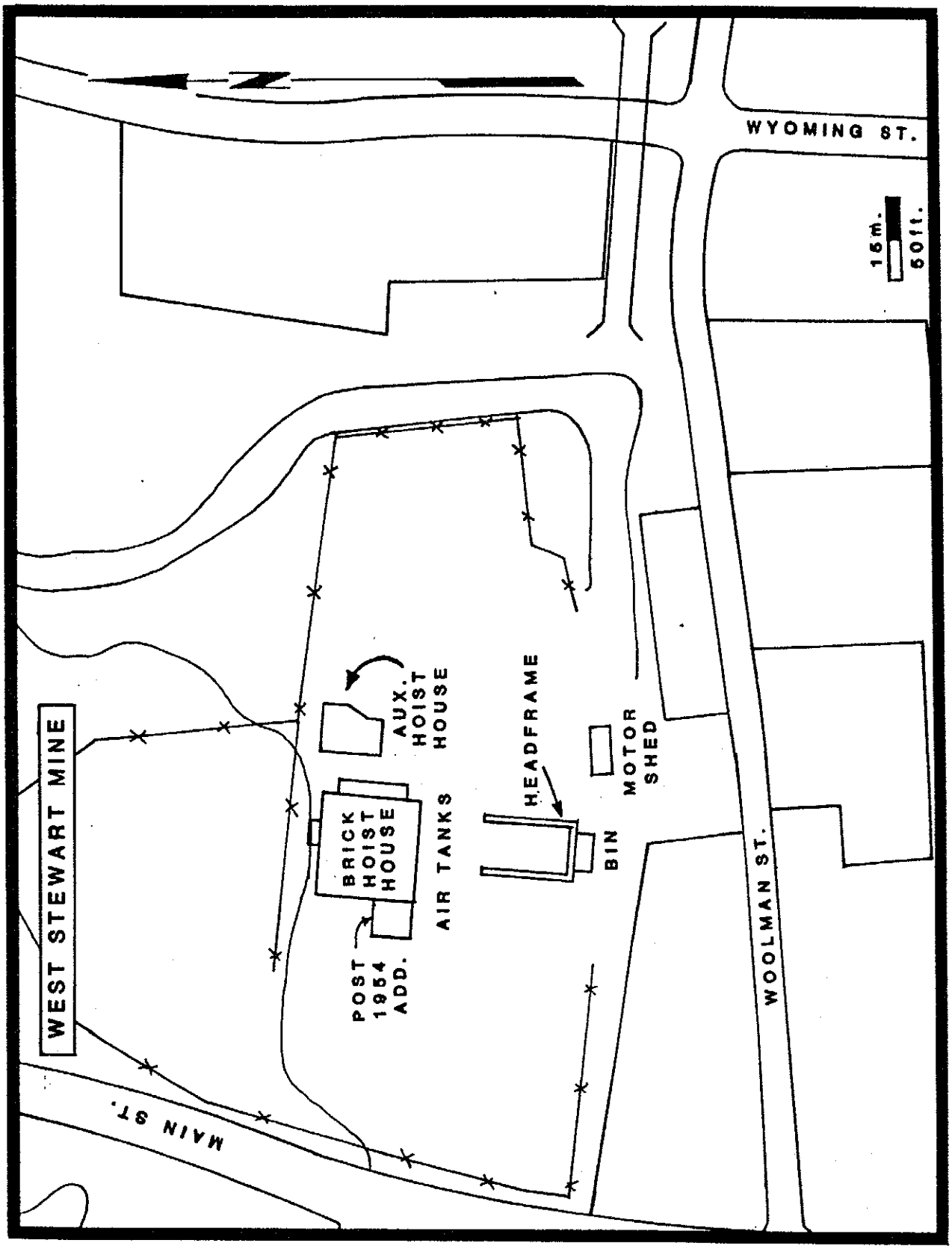

Figure 3. Structures Remaining at Stewart Mine 1987.

1V: FOOTNOTES

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